The present invention relates generally to an accessory for pool or billiard tables and more particularly to a portable lightweight device which may be quickly applied to and removed from the rail of a billiard or pool table to indicate to a player the exact spot at which a ball should strike the resilient cushion adjoining the rail in order to rebound at the proper angle and strike a second ball or enter a pocket.

The game of billiards (of which "table pool" is a species) is a well known game of skill which has been played for centuries, but which has been primarily considered as a man's game. Hitherto, the feminine sex has not accepted the game of billiards with the same wholeheartedness as the men as, as is the case in bowling, the cost of billiard equipment requires on the whole that it be played in public places. As a result, two additional handicaps to the game's popularity with the feminine sex have arisen.

First of all, the game did not rise to the "social" dignity required. However, the war and the resulting broadened outlook of the ladies in these modern times have largely overcome this Victorian attitude.

Secondly, the game of billiards requires a knowledge of angles so as to properly aim a shot, and subsequent skillful execution of the shots. The latter is a matter of practice which, however, is never effective if the aim (particularly on rebound shots) is incorrect. The ability of a billiard player to direct the cue ball properly on rebound shots is a tremendous factor in maintaining his morale and interest until he or she has acquired a sufficient skill in the game so as to properly execute all shots.

It is, accordingly, the chief object of the present invention to provide a light portable device which, upon being positioned upon the rail of a billiard table may be adjusted to indicate the proper point at which a ball should strike the resilient rail cushion in order to strike another ball or enter a pocket.

Another important object of the invention is to provide a readily portable accessory for billiard tables which will indicate the proper angle at which a rebound shot should be made.

A further object of the invention is to provide a billiard table accessory of the type described which is adjustable to readily and accurately fit standard and junior sized billiard tables.

A further object of the invention is to provide a rebound angle indicator for billiard tables which though readily detachable therefrom is slidably and pivotally mounted thereon.

Another object of the invention is to provide a device for teaching novices the theory of rebound with respect to angles of approach which vary from zero to 90°.

A still further object of the invention is to provide a rebound angle indicator having a base flange and including a pair of extensible arms having a common pivot point and arranged to include equal angles between them with respect to a perpendicular to the flange through the pivot point.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have disclosed two embodiments of my invention. In these showings:

Figure 1 is a fragmentary plan view of a conventional pool or billiard table showing the rebound angle indicator comprising the present invention in one operative position;

Figure 2 is a plan view of the invention to an enlarged scale;

Figure 3 is a central vertical sectional view thereof taken on the line 3—3 of Figure 2:

Figure 4 is a vertical sectional view taken on the line 4—4 of Figure 2, parts being shown in elevation;

Figure 5 is a plan view of one of the extensible arms and its attached arcuate rack; and

Figure 6 is a fragmentary side elevation partially in section of a modified form of the invention showing it slidably hinged to a pool table.

Referring now to the drawings, numeral 10 designates the playing surface of a billiard table having side rails 12 and 14, and end rails 16, each of which are provided with conventional resilient cushions 18 and 20, and 22, respectively. The table, when used for the game of "pool," is provided with the customary side and end pockets 24, 25, 28 and 30, two of the end pockets not being shown.

The device comprising the present invention consists of a rebound angle indicator 32 formed of wood, plastic, etc. or stamped from sheet metal of a gauge sufficiently strong for the intended purpose. The indicator comprises an inner section 34 provided with a pair of adjusting slots 36 and is connected to an outer section 38 by means of a pair of bolts and wing nuts 40 projecting through the slots 36.

The outer section 38 includes a downturned flange 42 intended to engage the table rails and which preferably rotatably supports a pair of rollers 44 for engagement with the outer edge of a rail without scratching the same. A second pair...
of rollers 45 is rotatably mounted in the horizontal portion of the section 38 and all rollers are preferably of rubber or rubber surfaced so as to be silent and avoid marring of the surface of the rails 14. It will be readily apparent that the section 38 may be readily adjusted as to position along any rail such as the rail 14 by grasping a handle 48 and rolling it therealong.

The outer section 38 has a pair of guides or rides 50 fixed thereto or formed thereon at right angles to the plane 42. The guides cooperate with the lateral edges of the inner section 34 and prevent the latter from turning with respect to the plane 42. The inner section 34 is bent as at 52 and then extends inwardly to terminate in a triangular section 56 which is supported for lateral adjustment on the rail 14 by a centrally positioned roller 58.

A pair of extensible arms 58 and 60 are pivotally mounted on and adjacent the apex of the triangular portion 56 by means of a bolt 55 having a large bearing washer 53 under the nut 57. The arms 58 and 60 as shown each constitutes three telescoping sections, but these sections may be flat or otherwise formed. As billiard tables are 10 ft. by 5 ft., each section of the extensible arms should be about 20" in length and extremely tight in weight.

A ball bearing race 59 may be mounted in a recess formed in the arms 58 and 60 about the bolt 55 to ensure free pivotal movement of the arms, while sagging with respect to each other due to their length, is prevented by the plate 55 and the washer 53. A pair of arcuate rack segments 62 and 63 are fixed respectively to the short ends of the arms 58 and 60 so as to face each other and coincide in a vertical plane. Each of the racks is provided with teeth 61 which mesh with a slightly bevelled pinion 64 (Figs. 2-5, inclusive) which is rotateably mounted in a stud 58 bolted or otherwise secured to the plate 54. Back lash between the pinion teeth and the racks is prevented by a spring 65 which urges the pinion teeth against the rack teeth roots.

It will now be readily apparent that as either of the extensible arms 58 and 60 moves about the bolt 55 so as to change position, the extensible arm will move through the same angular distance but in the opposite direction. The teeth 61 of the racks 62 and 63 are prevented from disengaging or overrunning the pinion 64 by the filled in tooth portions 62 at each of their respective ends.

In Figure 6, I have shown a modified form of the invention in which the indicator 32 is pivotally and slidably mounted along the side rails of a billiard table. A rod 70 is secured by brackets 72 to the side of the table just under the rail and extends preferably from corner pocket to corner pocket or from corner pocket to a side pocket. The outer section 38 is pivotally mounted to the rail 14 and then back therearound in hook fashion as at 74.

The rod 70 is sufficiently snubbed outwardly from the side of the table so that when not in use the indicator may be swung off the rail 14 and downwardly so as to be out of the way. The indicator may also be completely detached from the table by disengaging the hook portion 74 from the rod 70.

The preferred and modified embodiments are otherwise identical and their use in instructing novices at billiards is the same as will now be described. For purposes of illustration, I have shown a cue ball C and object balls O and P resting on the playing surface 10 in a typical or commonly occurring position.

Assuming that a game of billiards is in progress and a player wishes to knock the ball O into a pocket, the side pocket 26 would be the logical choice. It will be noted, however, that the way is blocked by ball P so that in order to knock the ball O must be struck by the cue ball C so as to knock the cushion 20 and rebound into the side pocket 24. In the case of the novice, the question immediately arises as to which point on the cushion 20, the ball O must hit so as to rebound in the proper angular direction and enter the pocket 24.

The proper point on the cushion may be readily and simply determined (Fig. 1) by positioning the indicator 32 on the side rail 14 so that both of the rollers 44 engage the rail edge. While holding the indicator in this position with one hand, the other hand is used to extend the arms 58 and 60 as much as required for accuracy as will appear. The arm 58 is then held pointed at the center of the pocket 24 with one hand while the indicator 32 is slid along the rail until the extended arm 58 is directly over the center of the ball O. The part of the cushion 20 which is directly under the extensible arm pivot point 55 is the exact spot at which ball O must strike the cushion in order to rebound at the proper angle so as to enter the pocket 24.

The angles of approach and rebound are equal. These angles are indicated as at a and b respectively and comprise respectively the angle between a line AB through the pivot point 55 at right angles to the side rails and extensible arms 58 and 60. It will be seen that repeated use of the rebound angle indicator will readily instruct the novice on the principles involved and permit him or her to devote himself exclusively to perfection of execution immediately.

Assuming that the ball P is to be deposited in the side pocket, it will be noted that ball O is in the way. Accordingly, the cue ball C must rebound from the cushion 20 at a certain point in order to strike the ball P and cause it to enter the pocket 24. The point in question is readily determined by using the indicator in the manner described. In this case, however, the arm 60 would be extended and the indicator 32 is then slid along the rail 14 until the extensible arm 58 is pointing to or is directly over the center of the ball C. Upon proper execution of the shot, the cue ball C will strike the cushion 20 directly under the pivot 55 and rebound to strike the ball P so as to knock it into the table pocket 24.

It will be readily apparent that the indicator comprising the present invention will be of even greater value in instructing the novice in the game of 3 cushion billiards. Here too the more indicators may be used by the application of the foregoing principles to render extremely simple the question of rebound which to novices is too often an insurmountable obstacle.

The indicator is of simple and rugged construction with little likelihood of becoming damaged in use. It is economical in cost and when in use may be suspended from the wall by its handle or pivoted downwardly out of the way. Its availability to billiard players should increase the popularity of the game tremendously, particularly with the feminine sex.

It is to be understood that the forms of the invention herewith shown and described are to be taken as preferred examples of the same and
that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

1. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction.

2. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said means comprising an arcuate rack fixed to each of said arms, and a pinion rotatably mounted on said member and engaging between and against said racks.

3. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said means comprising an arcuate rack fixed to each of said arms, a pinion rotatably mounted on said member and engaging said racks, and resilient means acting against said pinion to urge it between and against said racks to eliminate backlash therebetween.

4. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said means comprising an arcuate rack fixed to each of said arms, a pinion rotatably mounted on said member and engaging said racks, and resilient means acting against said pinion to urge it between and against said racks to eliminate backlash therebetween.

5. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said flange extending inwardly and terminating in a hook for attachment to the table.

6. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said flange extending inwardly and terminating in a hook for attachment to the table.

7. A rebound angle indicator for billiard tables having rails and cushions comprising a member having a flange engageable with the edge of a rail of the table, a pair of arms pivotally mounted on said member and having a common pivot so spaced from said flange as to be directly over the edge of a cushion when the flange engages the rail edge, and means coupling said arms whereby angular movement of one of said arms produces equal angular movement of the other of said arms in the opposite direction, said member including a plurality of rollers for engagement with a rail to facilitate adjustment of said member along said rail.

RAYMOND N. MATSON.

REFERENCES CITED

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

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<th>FOREIGN PATENTS</th>
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