

Oct. 21, 1952

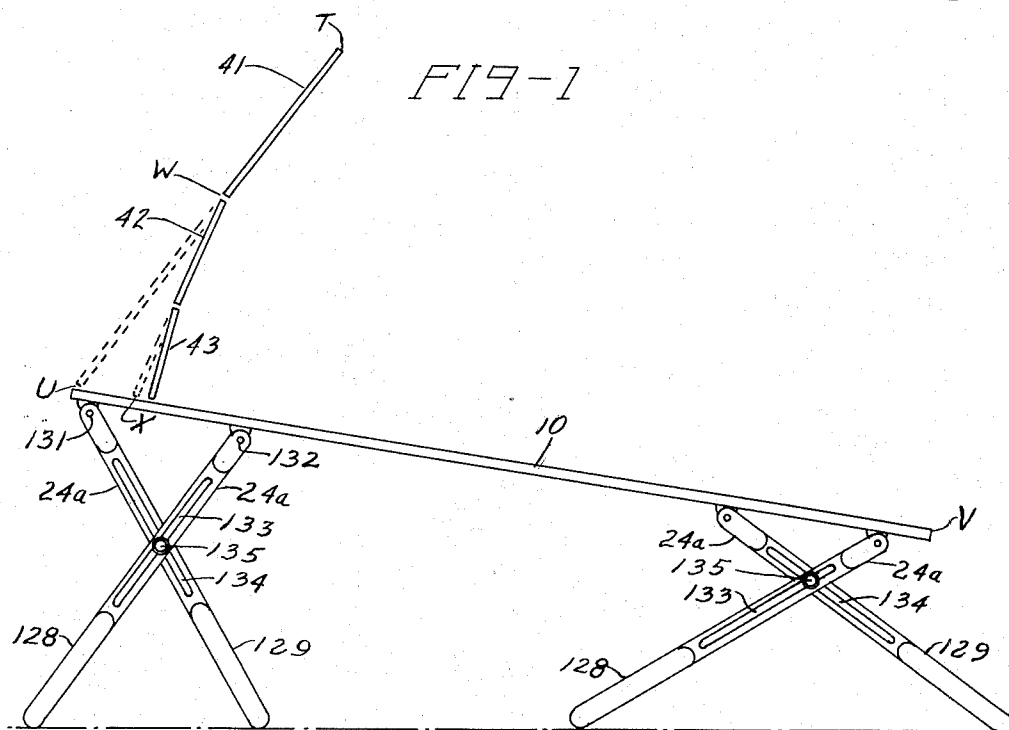
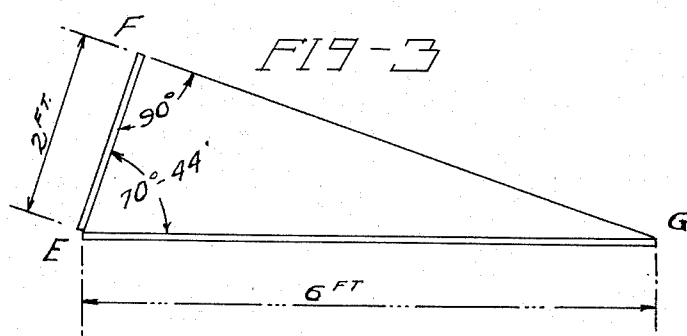
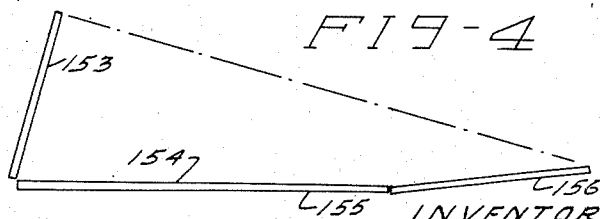
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2,614,839

BOUNCING BALL GAME APPARATUS

Filed Sept. 19, 1945

2 SHEETS—SHEET 1



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2,614,839

BOUNCING BALL GAME APPARATUS

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Application September 19, 1945, Serial No. 617,329

3 Claims. (Cl. 273-30)

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This invention relates to apparatus for games of the type played with a bat or racket and a ball, and more particularly to games of this general nature intended to be played indoors.

A further object of the invention is the provision of a game apparatus having a court and an abutment wall so constructed that there is such a relation between the height and inclination of the abutment wall and the length of the court that a ball struck against the abutment wall from a point directly in front thereof at any height will rebound onto the court.

Other objects and features of this invention will appear from the following description and appended claims and the accompanying drawings in which,

Fig. 1 is a diagrammatic view in side elevation of one of the preferred forms of the invention, including an abutment wall mounted on an adjustable inclined table used as a court;

Fig. 2 is a perspective view of a modified form of apparatus in which the end abutment wall consists of two panels converging toward the center, and with upright forwardly diverging side walls connected therewith;

Fig. 3 is a diagrammatic view in a side elevation showing the basic relationship of the height and inclination of the abutment wall to the length of the court;

Figure 4 is a view similar to Figure 3 but showing a modified form of court.

In the form of invention shown diagrammatically in Fig. 1, the apparatus consists of a court having a playing surface, free of obstructions, and an abutment wall having a playing portion arranged at an acute angle to the playing surface of the court. In the form of apparatus shown in Fig. 1, the court is formed on the upper surface of a table 10, the abutment wall in this figure being made up of three horizontally-divided panels 41, 42 and 43 disposed at gradually decreasing angular relation to the court playing surface 10, the relation of the angle of inclination of each such panel or playing portion of the abutment wall and the height thereof to the length of the playing surface of the court is such that a ball struck from in front of the abutment wall against said inclined portion of the abutment wall will rebound therefrom onto the table court.

The height of the abutment wall will be considered to be the distance from the uppermost edge of the abutment wall to the plane of the court measured along a line in the plane of the uppermost playing surface to its intersection

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with the plane of the court. For instance, the height of the abutment wall shown in Fig. 1 is the length of the line TU and the length of the court is the distance from this intersection to the forward edge of the court or the distance UV in Fig. 1.

The basic relationship of the angle or inclination of the playing portion of the abutment wall and the height of the wall to the length of the playing surface of the court is shown more or less diagrammatically in Fig. 3. This figure shows a single abutment wall EF or the sections 41, 42 and 43 of Figure 1 when arranged in the same plane. In Fig. 3 the line EG represents the length of the table court and the line EF the height of the abutment wall. Knowing the height of the abutment wall and the length of the table the problem is to determine at what angle the abutment wall must be arranged in order to insure a ball propelled against the wall from a point at the player's end of the court, directly in front of the abutment wall, to rebound onto the court. It is evident that a ball projected from the extreme forward edge of the court at G and striking the upper edge F of the abutment wall will rebound along the same line FG only if the angle at F is a right angle and that any ball from G striking the abutment wall below F will then rebound onto the court, also any ball struck from a point above G and striking the abutment wall will rebound onto the court if the angle EFG is a right angle. The angle FEG is such that if we consider a ball struck at the forward edge of the table as at G and striking the wall at its extreme upper end as at F and rebounding onto the court at G, the line FG is at a right angle to the line EF and the triangle EFG is, therefore, a right triangle. Now, if the height of EF, that is, the distance between E and F, be say 2 feet and the length of the court EG be 6 feet, then in the right triangle EFG the co-sine of angle E is equal to

$$\frac{EF}{EG} = \frac{1}{3}$$

or from the table of natural functions angle E is equal to $70^{\circ} 44'$. From this formula it is seen that the height EF of the abutment will vary as the co-sine of the angle E and that the length of the table EG will vary inversely as the co-sine of the angle E.

In actual practice it is so seldom that the ball is struck in such a way that it moves along the line FG just missing the end of the table at G

and perpendicular to the playing surface of the abutment wall at F that the point of origin or the height at which the ball may be considered as being struck may be a few inches above the playing end of the court. This will permit the angle E to be a little less acute than that shown in Fig. 3. In like manner, the angle at which the middle panel section 42, of Figure 1, should be set may be determined by extending the plane of the section or panel 42 until it intersects the court or the plane thereof as at X. Then consider the distance from X to the upper edge of the section 42 as the height of the abutment wall and the distance VX as the length of the court.

In the form of table court shown in Figure 1, the table 10 may be adjustable for varying the height and inclination of the court relative to the floor by any suitable means, such as a plurality of legs 24a, each composed of two bars 128 and 129 hinged to the under side of the table as at 131 and 132, respectively. These bars cross each other and are provided with slots 133 and 134 extending across each other longitudinally of the bars, and a bolt 135 holds the parts in adjusted position. By spreading the lower ends of the bars apart, the overall height of the corresponding leg 24a will be reduced and vice versa. This adjusting means permits the court to be used either in a substantially level position or at a slightly inclined angle toward the player end of the court, as desired.

In Figure 2 is disclosed a modified form of an apparatus shown more or less diagrammatically. In this form of invention, the table 137 may be like that shown in Figure 1 with adjustable supporting legs 138 and 139. For simplicity of illustration, they are shown in dotted lines as being crossed. The front legs 138 may, if desired, be so adjusted that they are shorter than the rear legs 139, so that the table 137 slants downwardly toward the front or player's end of the court.

The top of the table constitutes a table court 140 and has at the back or rear opposite the player's end of the court a horizontal abutment wall 141, V-shaped in horizontal section, comprising two panel sections 142 and 143 forming a wide dihedral angle diverging toward the player's end of the court, and having the vertex or line of intersection MN of the two panel sections in the vertical plane of the longitudinal axis of the court and inclined upwardly and forwardly therefrom.

Attached to the outer side edges of the panels 142 and 143 and extending forwardly and laterally in diverging relationship thereto are side walls or wings 144 and 145. These side walls function to prevent a struck or rebounded ball from leaving the court laterally before it reaches the player end of the court, and to afford increased diversity of play by directing the ball against a side wall before it strikes the end abutment wall or panels.

A front wall 146 may extend downwardly from the forward end of the court or table for preventing a struck ball from going beneath the table. The extreme corners of the table may be rounded as at 147, if desired.

Extending forwardly from the wall 146 at floor level is what for convenience may be termed a floor court with suitable boundary markers 148, which court may be used if desired under rules permitting a rebound on the floor.

It will be understood that the height and angular relationship of each of the two panels 142

and 143, with respect to the length of the table court of Figure 2, is substantially the same as previously described in connection with the forms of apparatus shown in Figures 1 and 3. In other words, each of said panels is so disposed that a plane intersecting its upper edge at right angles to said panel will not pass substantially above the edge of the court at the player end at any point.

For example, the line FG in Figure 2 represents a line drawn along the aforesaid right-angled plane and normal to the outer edge of panel 143 where the distance is shortest to the player edge of the court. As will be observed in this figure, line FG intersects the outer edge of the court in the same manner as line FG in Figure 3.

Due to this angular relationship of both the end abutment panels 142 and 143 to the surface of the court, as just described, any ball striking said panels from any position above the player's end of the court will tend to rebound from said panels upon the court surface before passing beyond the edge of the court at the player's end, in the same manner as in the form of apparatus shown in Figures 1 and 3. In addition, side walls 144 and 145 will confine the rebound of the ball more closely to the lateral limits of the court at the player's end, and greatly enhance the diversity of shots available to the players while keeping the ball in play.

From experience, I find that the most satisfactory results are obtained by arranging the panel sections 142 and 143 at an angle of approximately 169° to each other.

The game apparatus above described is particularly adapted for playing a game somewhat similar to table tennis but a court of approximately one-half the length of a table tennis court is required. In play, two opponents strike the ball alternately against the abutment wall from the same player position end of the court. In general, the rules may be somewhat similar to those used in table tennis, although of course variations are permissible. The game apparatus therefore requires much less floor space than table tennis for ordinary play.

It will be especially observed that, owing to the novel relationship between the height and angularity of the abutment wall with respect to the playing surface of the court area, a ball which is fairly struck against the playing area on the abutment wall will be deflected downwardly upon rebound toward the plane of the court before it reaches the player edge of the court. Accordingly, the game can be played with many more extended, uninterrupted rallies than in table tennis, and with less time and effort required for retrieving the ball between rallies.

In the form of apparatus shown in Figure 2, the horizontal angle at which the abutment panels 142 and 143 are disposed to each other also insures that, when a ball is hit straight up one side of the court and strikes one of the panels on that side, it will tend to rebound obliquely toward the other side of the court and, when a ball is hit diagonally to a panel on the other side, it will tend to rebound straight down the other side of the table. Thus, each of the two players can stand toward his own side of the end of the table and the ball will rebound toward the other player regardless of what part of the abutment wall it strikes. This tends to keep the two players apart and prevent interference between them as the game proceeds.

In order to add complexity to the game and

insure greater diversity in playing the same, the court may have on its playing area throughout its length, one or more inclined playing surfaces that are arranged at an angle to the surface of the main playing area.

One such arrangement is shown in Fig. 4. In this figure, the court 155 and abutment wall 153 are shown more or less diagrammatically. The court playing area is shown at 154 and has a playing surface 156 on its forward portion which inclines slightly upwardly toward the player's end of the court. The inclined surface may be of different forms and inclined in various directions. It will thus be seen that a ball rebounding from the abutment wall 153 and striking the inclined surface 156 of the court will have imparted to it a modified rebound that will tend to baffle the opponent player and his bewilderment will more than likely be further increased if the modified portion of the court be inclined laterally or both laterally and longitudinally of the court.

In this construction as well as in the forms previously described, the relation of the height and inclination of said abutment wall to the length of said court is such that a ball struck from directly in front of said wall at the player's end of the court and striking said wall at any height will rebound downwardly onto said court below the incident path of the struck ball.

It will be observed by reference to Figures 2 and 3 that the basic right angle relationship of the angle EFG in these figures applies to all lines extending in a plane intersecting the upper horizontal boundary of the playing area or areas which constitutes the upright abutment wall in all forms of the apparatus. Accordingly, the relation between the height and inclination of the abutment wall relative to the length of the court can be defined by stating that a plane intersecting the plane of the playing area substantially along its upper edge and also intersecting the forward edge of the court at its player position end is substantially at right angles to said playing area.

This is a continuation in part of my application Serial Number 443,847, filed May 21, 1942, for Game, now abandoned.

Although I have shown and described certain embodiments of my invention, it will be understood that I do not wish to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim as my invention:

1. In a bouncing ball game apparatus, an elongated table providing an unobstructed playing surface and having the forward end thereof as a player position end, an abutment wall fixed to and projecting upwardly from the opposite end of said table and having a plane unobstructed ball rebounding surface inclined at an acute angle to the plane of an adjacent portion of said table, the relative length of said table and height of said abutment wall being such that a line extending from the player position end of the table to the upper edge of the abutment wall is normal to the adjacent plane portion thereof, whereby a ball impinging the abutment wall will always rebound to a position within the area of the table, said abutment wall also including another plane rebounding surface at an angle to said first

plane surface and being so disposed relative to the table that a line extending from the upper edge thereof and normal thereto will also contact the forward player position end of the table.

2. In a bouncing ball game apparatus, an elongated table providing an unobstructed playing surface and having the forward end thereof as a player position end, an abutment wall fixed to and projecting upwardly from the opposite end of said table and having a plane unobstructed ball rebounding surface inclined at an acute angle to the plane of an adjacent portion of said table, the relative length of said table and height of said abutment wall being such that a line extending from the player position end of the table to the upper edge of the abutment wall is normal to the adjacent plane portion thereof, whereby a ball impinging the abutment wall will always rebound to a position within the area of the table, said table including a forward plane portion at an angle to and extending upwardly from said adjacent portion and whose forward edge provides said player position end of the table.

3. In a bouncing ball game apparatus, an elongated table providing an unobstructed playing surface and having the forward end thereof as a player position end, an abutment wall fixed to and projecting upwardly from the opposite end of said table and having a plane unobstructed ball rebounding surface inclined at an acute angle to the plane of an adjacent portion of said table, the relative length of said table and height of said abutment wall being such that a line extending from the player position end of the table to the upper edge of the abutment wall is normal to the adjacent plane portion thereof, whereby a ball impinging the abutment wall will always rebound to a position within the area of the table, said abutment wall comprising a pair of wall sections in angular relation to each other and being disposed at equal acute angles to a vertical plane extending through the central longitudinal axis of the table, and deflecting walls projecting upwardly from opposite sides of the table and having their rear ends connected to the outer edges of said wall sections.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
565,339	Ernest	Aug. 4, 1896
2,045,460	Goewey	June 23, 1936
2,066,724	Forsyth	Jan. 5, 1937
2,067,071	Browne	Jan. 5, 1937
2,161,463	Frost	June 6, 1939
2,162,438	Letarte	June 13, 1939
2,174,884	Kachel	Oct. 3, 1939
2,247,657	Girden	July 1, 1941
2,333,098	Forsyth	Nov. 2, 1943

FOREIGN PATENTS

Number	Country	Date
179,794	Great Britain	May 18, 1922
473,665	Great Britain	Oct. 18, 1937
533,809	France	Dec. 20, 1921