

Dec. 7, 1948.

H. H. KUCKS

2,455,422

SCORING DEVICE FOR TABLE TENNIS

Filed April 2, 1947

3 Sheets-Sheet 1

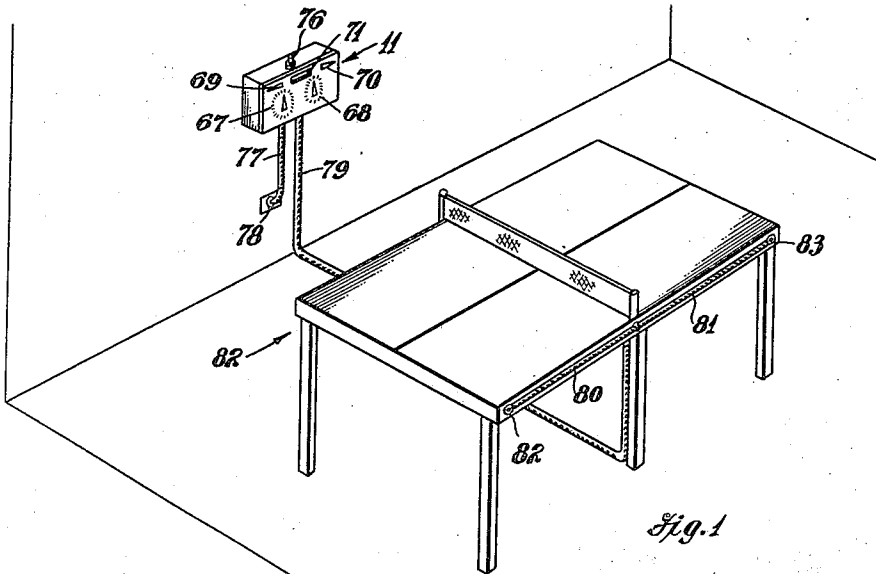


Fig. 1

Fig. 2

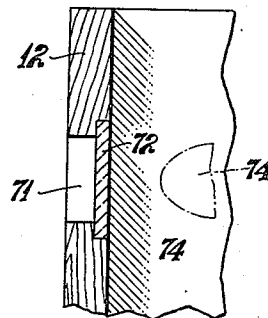
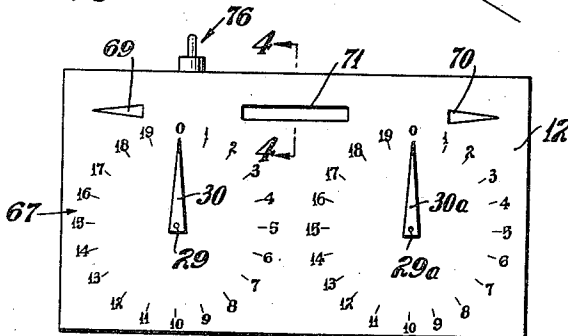


Fig. 4

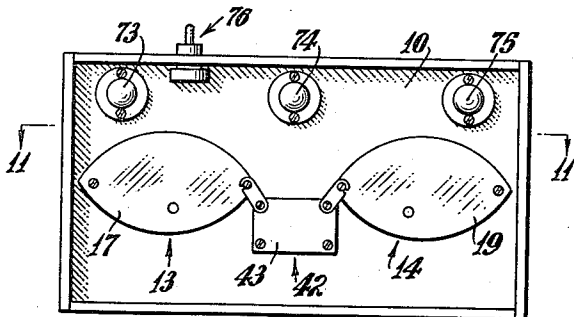


Fig. 3

INVENTOR
HOWARD H. KUCKS

BY *J. Ledermann*
ATTORNEY

Dec. 7, 1948.

H. H. KUCKS

2,455,422

SCORING DEVICE FOR TABLE TENNIS

Filed April 2, 1947

3 Sheets-Sheet 2

Fig. 5

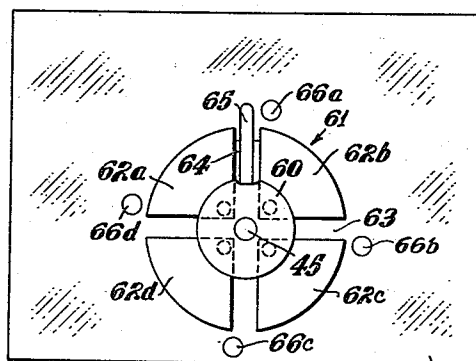
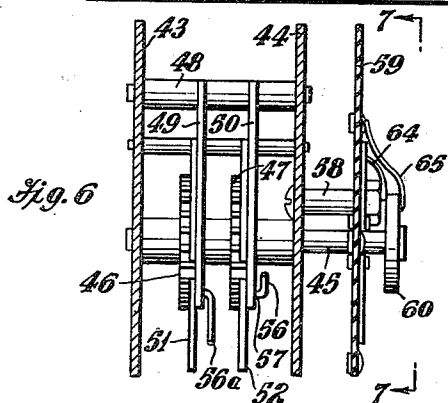
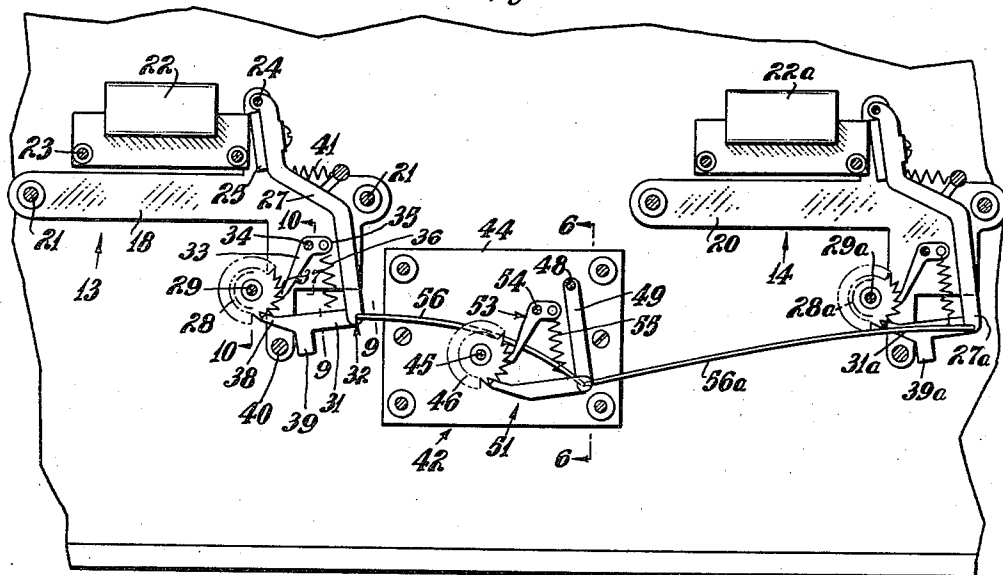


Fig. 7

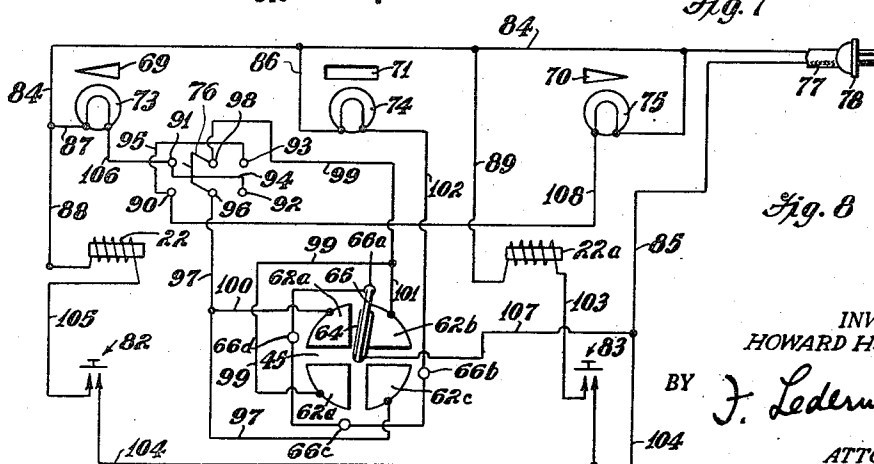


Fig. 8

INVENTOR.
HOWARD H. KUCKS

BY

J. Ledermann

ATTORNEY

Dec. 7, 1948.

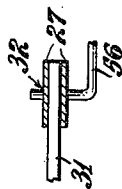
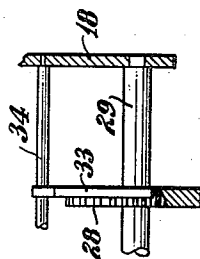
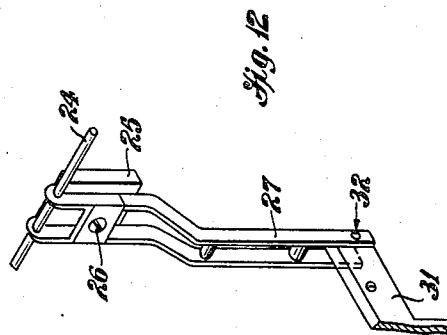
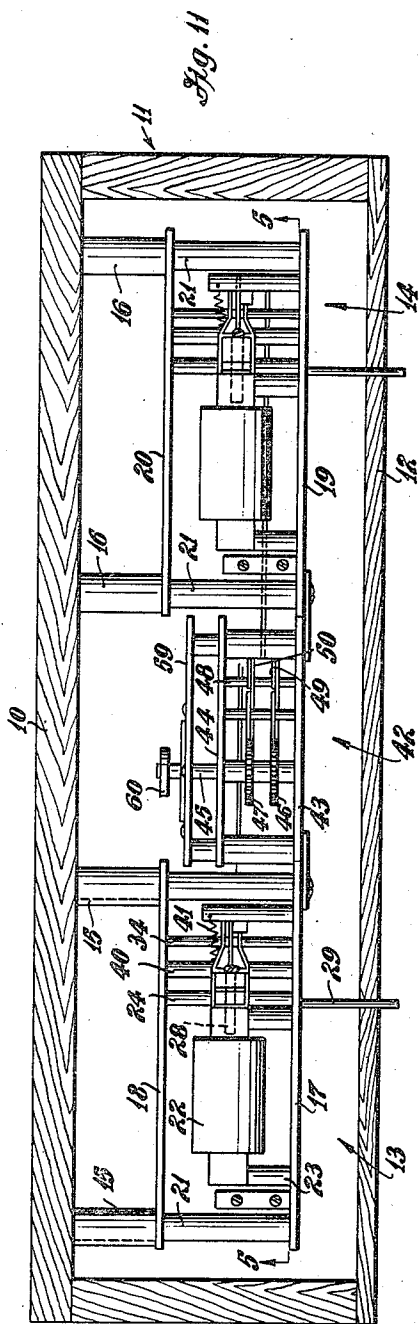
H. H. KUCKS

2,455,422

SCORING DEVICE FOR TABLE TENNIS

Filed April 2, 1947

3 Sheets-Sheet 3



INVENTOR.
HOWARD H. KUCKS

BY *J. Ledermann*
ATTORNEY

UNITED STATES PATENT OFFICE

2,455,422

SCORING DEVICE FOR TABLE TENNIS

Howard H. Kucks, Rockville Centre, N. Y.

Application April 2, 1947, Serial No. 738,993

6 Claims. (Cl. 177-384)

1

This invention relates to scoring devices, and more particularly aims to provide a novel, useful, and practical scoring means for a game of table tennis.

In playing table tennis it is necessary for the players to keep in mind not only the constantly changing score of each side but also the successive groups of five points at the end of each of which service changes from one side to the other. As a result of their concentration of interest on the playing of the game, players frequently lose count of either or both of the above tallies, with consequent confusion, and, occasionally, haranguing.

It is therefore the main object of this invention to provide an electrically operated scoring device or score recorder which may be contained in a box or on a panel mounted in a convenient position where it will be visible to the players, such as, for instance on the wall of a room, and to further provide push buttons or other suitable electric switches at convenient positions on the two sides of the game table, each switch being adapted to be closed by the player on that side every time he scores a point. The score recorder is provided with two separately visible dials, one connected with each of the said switches, where the total of each player's score is recorded, and it is further provided with visible indicating means to indicate which of the players is serving at any given time. Means is also provided within the device for automatically indicating the service change-over at the end of every successive run of five points played.

The above as well as additional and more detailed objects will become apparent in the following description, wherein characters of reference refer to like-numbered parts in the accompanying drawings. It is to be noted that the drawings are intended for the purpose of illustration only and that it is neither desired nor intended to limit the invention to any or all of the specific details of construction shown, excepting insofar as they may be deemed essential to the invention.

Referring briefly to the drawings,

Fig. 1 is a perspective view showing the interior of a game room containing a table tennis table and illustrating the application of the invention thereto.

Fig. 2 is a front elevational view of the score recorder box, showing the front panel containing the score recording dials and the additional indicating means.

Fig. 3 is a view similar to Fig. 2, with the front panel removed.

2

Fig. 4 is a sectional view taken on the line 4-4 of Fig. 2.

Fig. 5 is a sectional view taken on the line 5-5 of Fig. 11.

Fig. 6 is a sectional view taken on the line 6-6 of Fig. 5.

Fig. 7 is a view taken on the line 7-7 of Fig. 6.

Fig. 8 is a wiring diagram of the device.

Fig. 9 is a sectional view taken on the line 9-9 of Fig. 5.

Fig. 10 is a sectional view taken on the line 10-10 of Fig. 5.

Fig. 11 is a sectional view taken on the line 11-11 of Fig. 3.

Fig. 12 is a fragmentary perspective view of the armature of one of the two electromagnets.

Referring in detail to the drawing, the numeral 10 indicates the rear wall of a box or housing 11, and 12 indicates the front wall or panel thereof. Longitudinally spaced frames 13 and 14 are held by means of horizontal supports 15 and 16, respectively, within the enclosure of the box 11. The frames 13 and 14 are alike; the former comprises a pair of spaced vertical plates 17 and 18, and the latter comprises the spaced vertical plates 19 and 20. These spaced vertical plates are retained in their spaced relationship by means of spacer posts or the like 21.

An electromagnet 22 is supported by means of posts or screws 23 against the plate 17 in horizontal position between the plates 17 and 18, against the plate 17, and on a transverse pin 24 the armature 25 of the electromagnet is pivotally suspended. Secured to the armature 25 by means of a screw 26, is one end of a deformed and downwardly extending bifurcated arm 27. A ratchet wheel 28 is mounted rigid on a shaft 29 which is supported rotatably in the plates 17 and 18 and whose forward extremity passes through an opening through the front panel 12. A pointer 30 is rigid on the free extremity of this shaft.

A pawl 31, has its rear end pivotally secured at 32 between the spaced sides of the bifurcated arm 27. A second pawl 33, of the conformation of a bell crank, is pivotally mounted on a pin supported between the plates 17 and 18. A coiled spring 36 joins the short arm 35 of the crank 33 with the pawl 31 near the pivot of the latter. The nose 37 meshes with the teeth of the ratchet 28 and is normally urged into the teeth by the spring 36, and the spring 36 hence also normally urges the nose 38 of the pawl 31 against these teeth. It is now apparent that, upon energization of the electromagnet 22, the pawl 31 will move to the left, Fig. 5, and rotate the ratchet

28 through an arc, and the pawl 33 will serve to prevent reverse rotation of the ratchet.

By provision of a depending lug 39 on the pawl 31, a limit stop is provided to limit the rotation of the ratchet a distance of one tooth for each forward movement of the pawl 31. A spring 41 restores the armature to its normal position spaced from the electromagnet end upon opening of the circuit, and hence also restores the pawl 31 to the position shown in Fig. 5.

Between the two frames 13 and 14, a third frame 42 is supported on the two mutually adjacent supports 15 and 16, and this frame also comprises two spaced plates, 43 and 44. A shaft 45 is rotatably mounted between the plates 43 and 44, and rigid thereon between the plates are a pair of spaced identical ratchet wheels 46 and 47. A pin 48 is rigidly mounted in and extends between plates 43 and 44. The upper ends of identical spaced links 49 and 50 are pivotally supported from the pin 48, each link 49 lying in the plane of one of the ratchets 46 and 47. At its lower end the link 49 is pivoted to the rear end of a pawl 51 whose nose engages the ratchet 46, and likewise at its lower end the link 50 is pivoted to the rear end of a like pawl 52 whose nose engages the ratchet 47. On a cross pin 54 supported between the plates 43 and 44, a pair of like bell crank pawls 53 are pivoted, each in the plane of one of the ratchets 46 and 47. The nose of each of the latter pawls engages its respective ratchet, and the extremity of the other or short arm thereof is connected by a coiled spring 55 with its respective other pawl 51 or 52. A stiff wire 56 has its extremities bent at right angles; one such extremity is shown at 32 and provides the pivot for the pawl 31, Fig. 12, by being passed through aligned openings in the sides of the arm 27; the other of the said bent extremities is shown at 57 and provides the pivotal support or interconnection between the link 50 and the pawl 52.

The frame 14 has mounted thereon an exact reproduction of the electromagnet and all the parts associated therewith as above described, and therefore, in consideration of simplification of the description, all parts of the mechanism in the frame 14 which are similar to those in the frame 13 are indicated by the same reference numerals followed by the letter *a*. The wire 56*a* is likewise similar to the wire 56, but it joins the common pivot of the arm 27*a* and the pawl 31*a* with the common pivot of the link 49 and the pawl 51.

It is apparent that, when the magnet 22 is energized as above mentioned, not only will the ratchet 28 be turned through an arc of one tooth, but, because of the wire 56, the ratchet 47 will likewise turn through one tooth. Also, when the magnet 22*a* is energized, its ratchet 28*a* will turn through an arc of one tooth in the same direction, and, because of the wire 56*a*, the ratchet 46 will simultaneously be turned one tooth. Thus, each time either of the two electromagnets is energized the shaft 45 will be turned through an arc equivalent to the distance of a tooth on any of the ratchets described, each of these ratchets of course having the same diameter and the same number of teeth.

A plate 59 of insulating material, is supported parallel with and spaced from the plate 44 by means of a screw pillar or the like 58, and the shaft 45 passes through an opening therethrough. A metallic head 60 is rigid on the free extremity of the shaft 45. Secured against the plate

59 and concentric with the shaft 45, is a disc 61 which is divided into four quadrants 62*a*, 62*b*, 62*c*, and 62*d*, separated and hence insulated from each other by radial spaces 63. A spring finger 64 is fixed to the underside of the head and extends downward and has its extremity in frictional contact with the disc 61. It is apparent that as the shaft 45 turns, the finger 64 passes from contact with one quadrant 62 to contact with the next quadrant 62, and so on. A second spring finger 65 is fixed to the head 60 and extends into frictional contact with the plate 59. Four metallic contacts or points 66*a*, 66*b*, 66*c* and 66*d* are imbedded in the plate 59 at equally spaced intervals in the orbit of the free extremity of the spring 65, and each point 66 is positioned adjacent the radial line through one of the slots 63, as shown in Fig. 7.

The shaft 30*a* is, as indicated, identical to the shaft 30, and likewise extends rotatably through the front panel 12 and has fixed thereon a pointer 30*a*. The front panel is provided with graduated dials 67 and 68, reading from "zero" to "20," concentric with the shafts 29 and 29*a*, respectively. Adjacent the upper left hand corner of the box 11, an arrow-shaped opening 69, pointing to the left, is cut through the panel 12, and adjacent the upper right-hand corner a similar but oppositely directed opening 70 is provided. Intermediate these openings a rectangular opening 71 is cut through the panel. The opening 71 may be backed by a transparent strip 72 on which the legend "Change serve" may be printed; the openings 69 and 70 may likewise be backed by similar transparent strips, not shown. Light bulbs 73, 74, and 75 are mounted against the rear wall 10 behind the openings 69, 71, and 70, respectively.

A double pole, double throw switch 76, which may be of the toggle type, is mounted on the roof of the box. A two conductor lead 77, having the usual connector plug 78 on its end to plug the apparatus into the house current outlet, leads into the box. A four conductor lead 79 leads from the box, which is adapted to be mounted on a wall, as shown in Fig. 1, to the game table 82, where it divides into two two-conductor leads 80 and 81 extending to opposite sides of the table. The leads 80 and 81 have connected to their extremities push buttons 82 and 83, respectively, which are attached to the table. The wiring diagram is shown in Fig. 8. Leads 84 and 85 lead out of the flexible conductor 77, the former extending through the box in the fashion of a bus bar and being tapped by a lead 86 leading to the lamp 74. A second lead 87 is tapped to the lead 84 and leads to the lamp 73. A third lead 88 is tapped from the lead 84 and leads to the electromagnet 22. A fourth lead 89 is tapped from the lead 84 and leads to the electromagnet 22*a*. The end pair of poles 90—91 and 92—93 of the switch are reverse-connected or shunted by jumpers 94 and 95, as shown in the diagram. One neutral or central pole 96 leads through the lead 97 to the quadrant 62*c*. The other neutral pole 98 leads through the lead 99 to the quadrant 62*d*. A jumper tap 100 connects the lead 99 with the quadrant 62*a*, and a jumper tap 101 connects the lead 99 with the quadrant 62*b*. A lead 102 leads from the lamp 74 to the contact point 66*b* and terminates at the contact point 66*a*, touching and contacting in its path the points 66*c* and 66*d*. The lead 107 leads to the shaft 45. (In the wiring diagram, for the sake of simplicity,

the fingers 64 and 65 are shown as extending directly from the shaft 45, the head 60 being omitted.) A lead 103 joins the other side of the electromagnet 22a with the push button 83, and a lead 104 extends from the lead 85 to the other side of this push button. The lead 104 continues to the push button 82, and a lead 105 joins the other side of the latter to the other side of the electromagnet 22. A lead 106 connects the lamp 73 with the switch pole 91, and a lead 107 connects the lead 85 with the shaft 45. A lead 108 joins the lamp 75 with the switch pole 90.

It is apparent that as the shaft 45 rotates notch by notch, and there are twenty notches per revolution, at every fifth notch the finger 65 contacts with one of the points 66, and at the time of such contact the circuit is closed through the lamp 74 which thus makes visible the legend "change serve" in the opening 71. The contact finger 64 lies directly under the finger 65, and obviously, during successive intervals of five notches of rotation of the shaft 45, the finger 64 is in continuous contact with first one quadrant 62, then the next succeeding, and so on. For instance, assuming clockwise rotation, Fig. 8, the finger 64 is shown clear of all the quadrants 62 excepting that shown at 62b, and the finger 65 is in contact with the point 66a. As the shaft 45 rotates successively through the next five notches, during the first four the finger 64 remains in contact with the quadrant 62b, and on the fifth it jumps over to the quadrant 62c. After the finger 65 leaves the point 66a, during the next four notches of rotation it rides on the insulation and hence the circuit through the lamp 74 is open, but on the fifth notch, it makes contact with the point 66b and again closes the circuit through the lamp 74. This goes on continuously as the shaft is rotated notch by notch.

Rotation of the shaft 45 is accomplished as follows: Each time the button 83 is pressed it energizes the electromagnet 22a, whence the ratchet 28a is turned one notch and, as previously described, the wire or rod 56a turns the ratchet 46 and shaft 45 one notch. Likewise, each time the button 82 is pressed, the electromagnet 22 is energized and causes its ratchet 28 to turn one notch and hence also the ratchet 47. As both ratchets 46 and 47 are rigid on the shaft 45, the latter will thus rotate through a notch each time either button 82 or 83 is pressed. Thus, whenever the sum of successive pressings of either or both buttons 82 and 83 is equal to five, the lamp 74 will light up.

With the switch 76 thrown to the left, Fig. 8, the lamp 73 is energized through the lead 84, lead 87, lead 106 to pole 91, to pole 98, through lead 99, through lead 101, through quadrant 62b, through finger 64, through shaft 45, and through leads 107 and 85. As long as the finger 64 slides over the quadrant 62b, the lamp 73 will remain lit, thus lighting up the visible arrow 69 to indicate that the player on the left of the table is serving. When the shaft has rotated through five notches from the position shown, at the same instant that the lamp 74 lights up, as stated, the finger 64 will have left the quadrant 62b and passed over to the quadrant 62c, thus opening the circuit through the lamp 73 and closing the circuit through the lamp 75, as is obvious from the wiring diagram. After the shaft has been rotated another five notches, the lamp 74 will again be ignited, and the lamp 75 will be ex-

tinguished while the lamp 73 becomes ignited, and so on.

In playing the game of table tennis, it is necessary at the end of each game for the players to change courts, that is, to switch positions to opposite sides of the table. Consequently, it is necessary at such times to change the serve indicator arrows 69 and 70, to indicate the proper side for service. This is done by throwing the switch 76 to the opposite side, that is, from the left to the right, Fig. 8. If this is done with the fingers 65 and 64 in the positions shown in Fig. 8, the lamp 73 will be extinguished and the lamp 75 will be energized, as is obvious from the diagram. Thus, at any time the switch 76 is thrown, it will extinguish the arrow 69 or 70 which is illuminated and light up the one which is dark.

Each time a player scores a point he presses the button 82 or 83 on his side of the table, and the corresponding pointer 30 or 30a will advance one notch and show on his dial on the panel 12. This was made apparent in the description, above, of the operation of the electromagnets and the mechanisms associated therewith. Thus, the players can always tell the correct score by glancing at the dial panel. The game terminates when one of the players has reached a score of twenty-one points. At the start of a game, both pointers 30 and 30a are brought to their zero positions. If desired, audible signalling means, not shown, could be substituted for the lamp 74 or provided in addition thereto, in an obvious manner.

Obviously, modifications in form and structure may be made without departing from the spirit and scope of the invention.

I claim:

1. A scoring device comprising a housing including a front wall and having a shaft rotatably mounted therein, a pair of spaced shafts mounted in said housing parallel with said first shaft, means for selectively rotating said pair of shafts intermittently, means connecting said pair of shafts with said first shaft for imparting selective intermittent rotation of said pair of shafts, additively to said first shaft, said pair of shafts having pointers thereon, said housing having a pair of electric lamps therein, said housing having a support of insulating material mounted parallel with said front wall, said first shaft extending rotatably through said support, said supports having a metallic disc mounted thereon concentric with said first shaft, said disc being composed of four circumferentially spaced quadrants, said first shaft having a radial contact finger in frictional contact with said disc, a lead in connector containing two conductors having one of said conductors connected to said first shaft, leads connecting the other of said conductors to one terminal of each of said lamps, leads connecting the other terminal of one of said lamps with one pair of diametrically opposed quadrants of said disc, and leads connecting the other terminal of the other of said lamps with the other pair of diametrically opposed quadrants of said disc, said lead in being adapted to be connected to an electric outlet.

2. The device set forth in claim 1, said support having four equally circumferentially and radially spaced contact points thereon, said housing having a third electric lamp therein, a lead connecting one terminal of said third lamp with said one terminal of said plug, a lead connecting the other terminal of said third lamp with one of said contact points, said first shaft having a

7

second radial contact finger extending therefrom, said second finger having the extremity thereof in contact with an imaginary circle drawn through said contact points.

3. The device set forth in claim 1, said support having four equally circumferentially and radially spaced contact points thereon, said housing having a third electric lamp therein, a lead connecting one terminal of said third lamp with said one terminal of said plug, a lead connecting the other terminal of said third lamp with one of said contact points, said first shaft having a second radial contact finger extending therefrom, said second finger having the extremity thereof in contact with an imaginary circle drawn through said contact points, said contact fingers lying substantially in a common plane through the axis of said shaft.

4. The device set forth in claim 1, said front wall having two openings therethrough, said pair of shafts extending rotatably through said openings, said pointers being positioned on said pair of shafts forward of said front wall, said front wall having graduated dials thereon concentric with said openings.

5. The device set forth in claim 1, having electrical means interposed in the circuit between said pair of lamps and said pairs of diametrically

8

opposed quadrants for switching said pair of lamps through an angle of ninety electrical degrees with respect to said pairs of quadrants.

6. The device set forth in claim 1, said first-named means comprising electromagnets each having a push-button switch in series therewith, each of said electromagnets and its said push-button being bridged across said conductors, said pair of shafts having ratchets thereon, means connecting each of said ratchets with the armature of one of said electromagnets for advancing the ratchet through an arc of one tooth upon energization of the electromagnet upon closing the push-button switch thereof and for maintaining the ratchet in its advanced position at the end of said arc upon opening of the push-button switch, said third shaft having a ratchet thereon, said last-named ratchet having means associated therewith for rotating the same, and means connecting each of said advancing means of the electromagnets with said last-named ratchet means to rotate said last-named ratchet through an arc of one tooth upon rotation of either of said first-named ratchets through an arc of one tooth as aforesaid.

HOWARD H. KUCKS.

No references cited.