

Nov. 9, 1954

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2,693,959

TARGET APPARATUS WITH ELECTRICAL INDICATOR

Filed Jan. 31, 1952

4 Sheets-Sheet 1

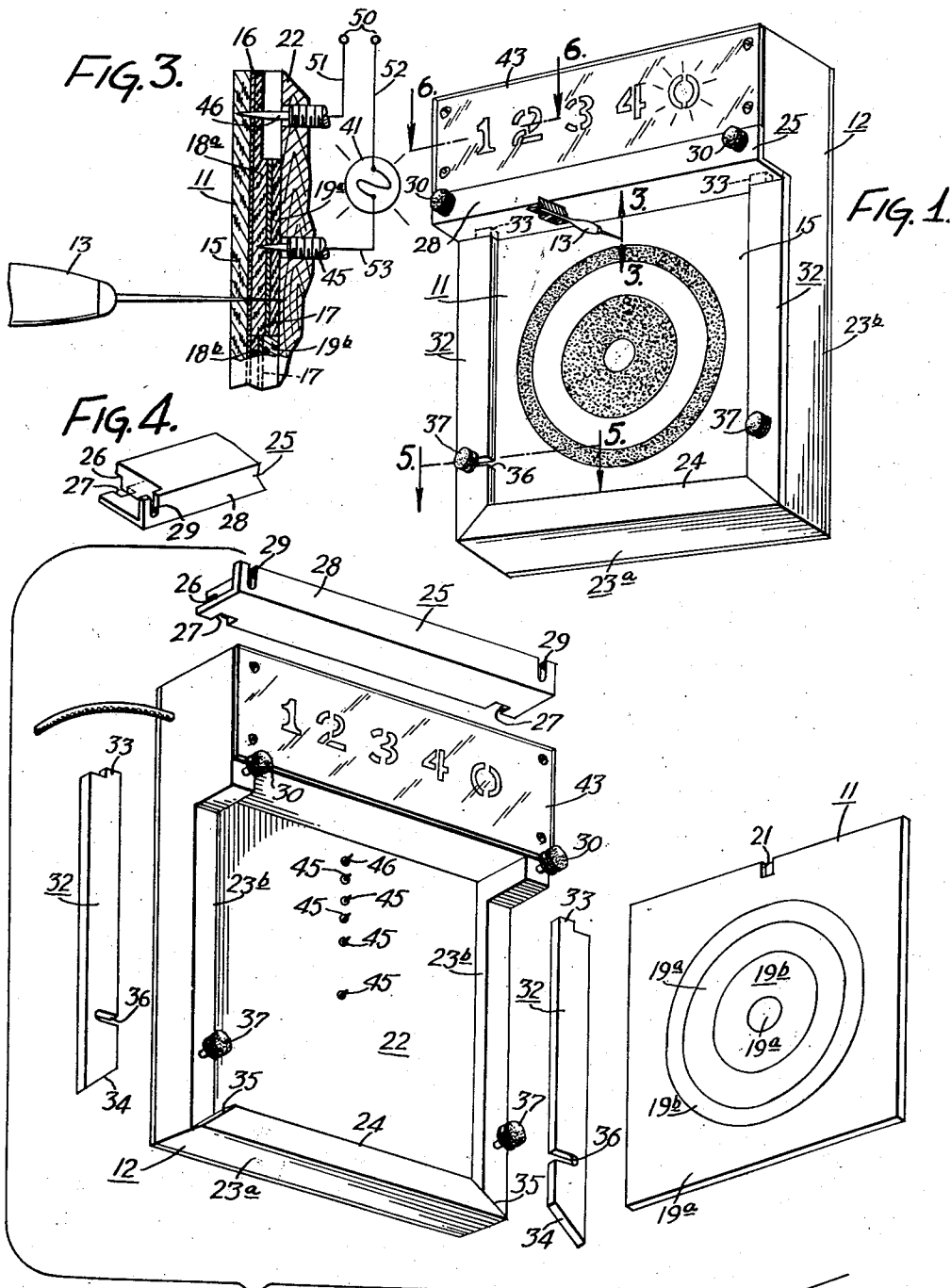


FIG. 2.

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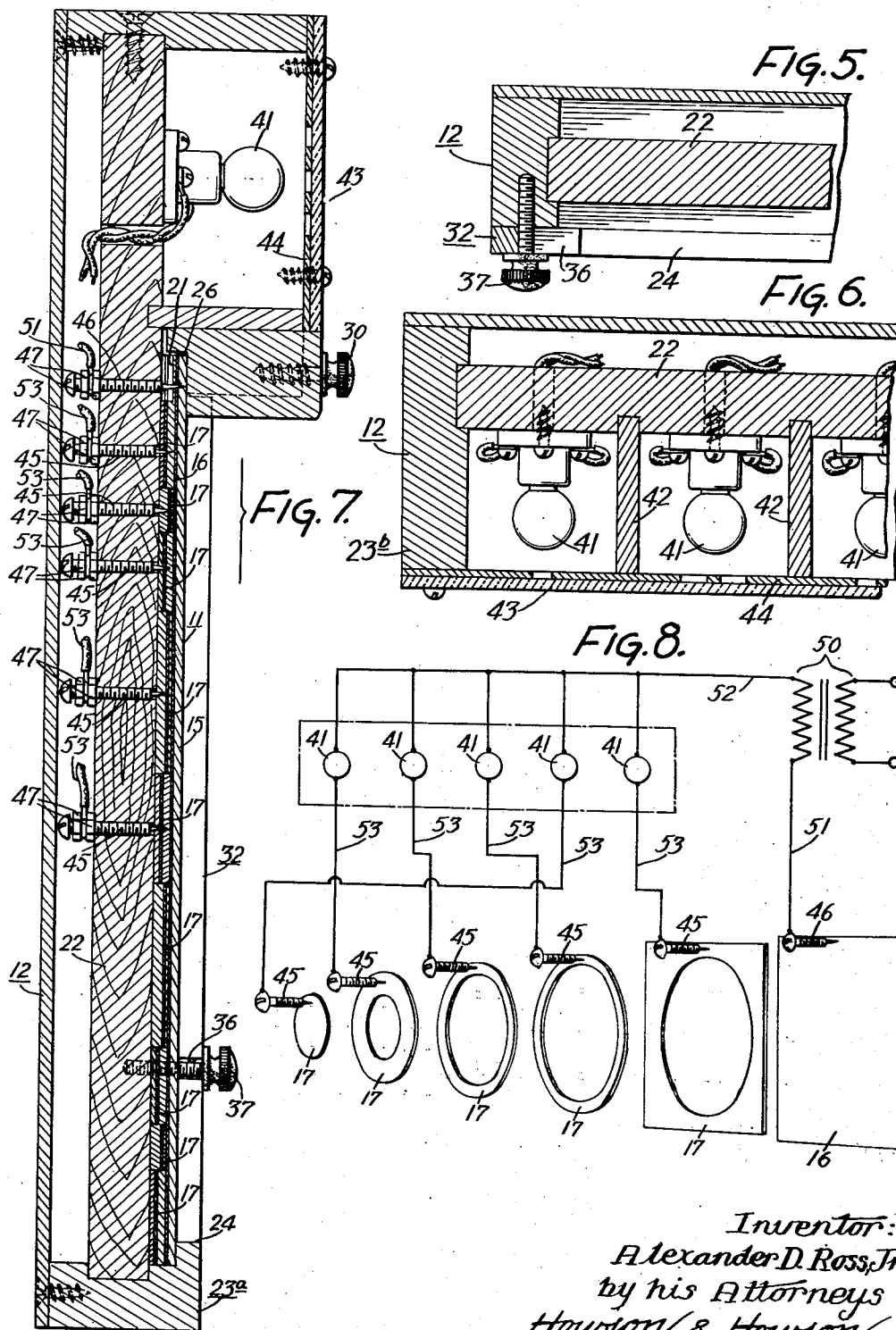
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4 Sheets-Sheet 2



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FIG. 11.

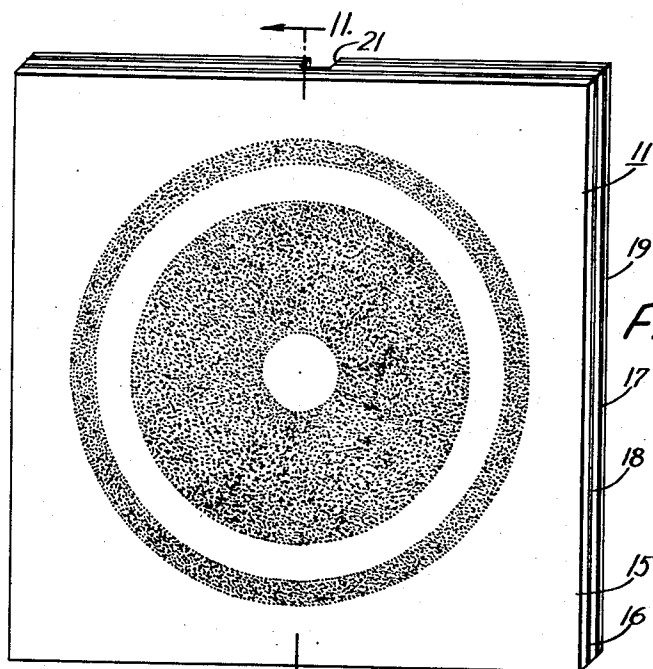
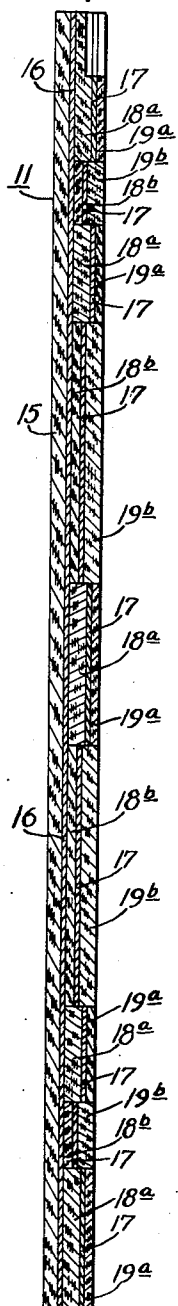


FIG. 9.

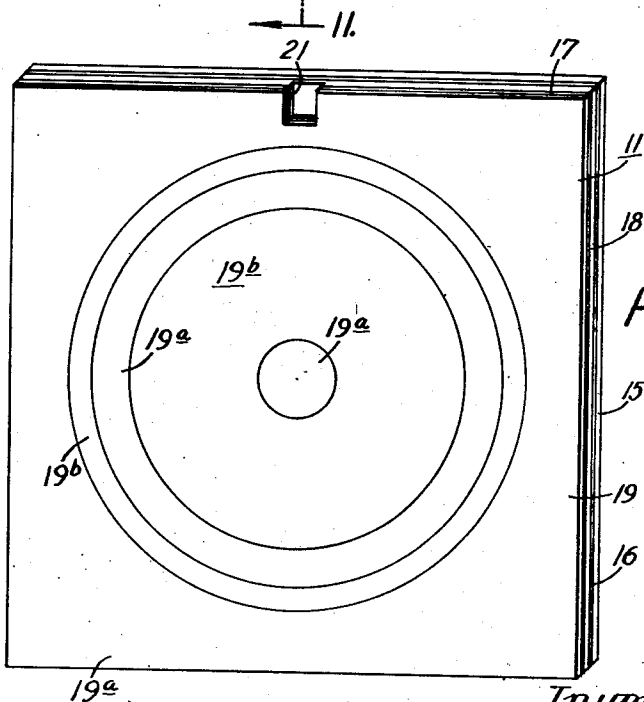


FIG. 10.

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FIG. 12.

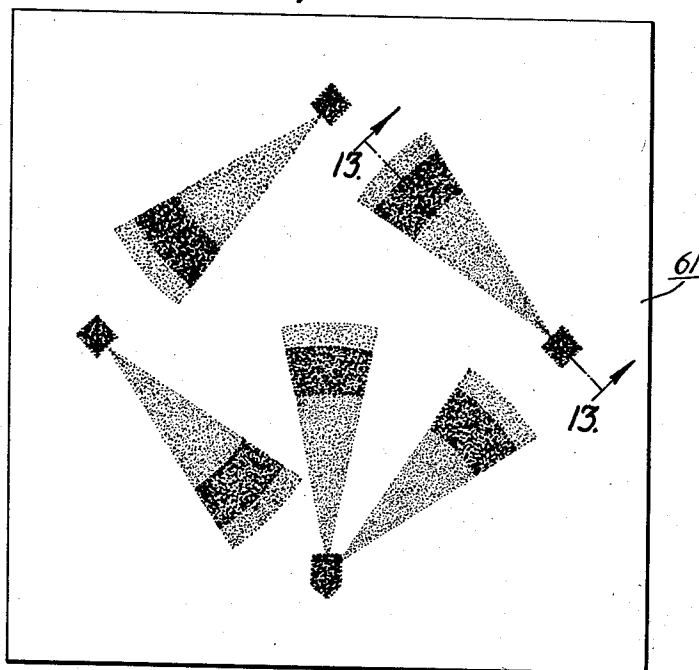
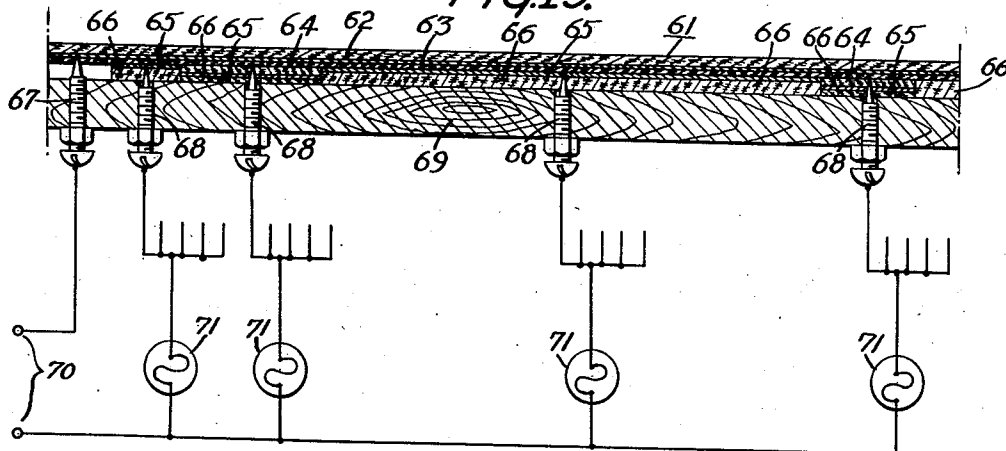


FIG. 13.



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TARGET APPARATUS WITH ELECTRICAL INDICATOR

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Application January 31, 1952, Serial No. 269,221

7 Claims. (Cl. 273—102.2)

The present invention relates to game sets and more particularly to dart games wherein the position of the dart on the target is registered on an electric signal device.

Prior to the present invention, dart games of this character generally comprised a target surface having permanently imbedded therein wire grids or thin metal foils spaced apart and adapted to be pierced and electrically connected by the metal point of a dart. The grids of the game sets were positioned according to the design on the face of the target but in order to provide for insulation between the various grids, it was necessary to outline the grids with suitable insulation material with the obvious result that certain portions of the board would not register on the signal device.

In addition, the prior boards were expensive to manufacture and were especially susceptible to functional deterioration after prolonged periods of use. Various proposals have been advanced to provide for interchangeability of the target surface, but each of these prior methods have inherent faults which makes their production on a commercial scale impractical. One such method of providing for removable playing surfaces includes contacts on the rear face of a removable panel which register with spring contacts affixed to the framework of the board. The spring contacts thus provided are likely to lose their initial resiliency after prolonged periods of use, and further they require substantial spacing between the removable panel and the framework of the set. It is apparent, therefore, that the panel will lack a suitable backing so that the panel is highly susceptible to deformation when positioned in the framework.

Other methods have been proposed wherein electrical connection between the playing surface portion and the framework is effected by permanently soldered or grooved connections. It is apparent that such connections will impede the removability of the target section, and, consequently, will render such devices impractical for the present purpose.

A primary object of the present invention therefore is to provide a game set of the stated class having a removable target panel wherein the panel is provided with a substantial backing over the entire target area.

A further object of the present invention is to provide a game set wherein electrical contact between the framework and the replaceable target panel is effected positively upon insertion of the panel into the framework.

Another object of the present invention is to provide a replaceable target panel for a game set of the stated class wherein the space between adjacent registering areas is reduced to a minimum.

A still further object is to provide a replaceable target panel for a game set which is easily replaceable and is adapted to economical manufacture.

These and other objects of the invention are obtained from the construction and formation illustrated and described in the specification of which the attached drawings constitute a part, wherein:

Fig. 1 is a perspective view of a game set made in accordance with the present invention;

Fig. 2 is an exploded perspective view of the game set showing various structural elements thereof;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1, with a schematic showing of a portion of the electrical circuit;

Fig. 4 is a fragmentary perspective view of a structural element of the framework;

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Fig. 5 is an enlarged sectional view on the line 5—5 of Fig. 1 with the panel removed.

Fig. 6 is an enlarged sectional view on the line 6—6 of Fig. 1;

Fig. 7 is a vertical sectional view of the game set illustrated in Fig. 1;

Fig. 8 is a schematic wiring diagram of the electrical circuit of the game set;

Figs. 9 and 10 are front and rear perspective views of a replaceable target panel, respectively;

Fig. 11 is an enlarged sectional view on the line 11—11 of Fig. 9;

Fig. 12 is a face view of a modified form of replaceable target panel for a game set made in accordance with the present invention; and,

Fig. 13 is an enlarged sectional view on line 13—13 of Fig. 12.

Referring now to the drawings, the game set illustrated therein comprises a target panel 11 having formed integrally therein electrical elements (more fully described below), and a casing 12 for supporting the panel and including electrical circuit means for registering the position of the dart and adapted to engage the electric elements of the panel for operative connection therewith. The panel 11 is susceptible to penetration by the metal point of a dart, as indicated at 13, in Fig. 1, so that the dart may complete an electric circuit through the elements of the panel to an appropriate signal device in the casing.

The panel 11, clearly illustrated in Figs. 9, 10 and 11, comprises a laminated structure, the front face 15 of which is imprinted with a suitable target design, in the present instance, a bulls-eye. The front face 15 is preferably formed of cork or like material which is susceptible to penetration by the metal point of a dart. Underlying the complete surface area of the front face is a thin metal foil element 16 constituting one of the aforementioned electrical elements of the panel. A plurality of further foil elements 17, each conforming in contour with one of the target rings of the bulls-eye are spaced from and parallel to the element 16 as more fully described hereinafter. To insulate the elements 16 and 17, intermediate layers 18 of cork or like material are provided. It should be noted that adjacent layers indicated by the reference numerals 18a and 18b, respectively, are of different thicknesses to provide for separation or offsetting of adjacent foil elements 17.

It is apparent that the layers 18a are sufficiently thicker than the layers 18b to prevent inadvertent electrical contact between adjacent foil elements 17. To preserve the staggered relationship of the elements 17, backing layers of cork 19 are provided. It is to be noted that the backing layers 19 are arranged in two thicknesses indicated respectively by the reference numerals 19a and 19b and so as to provide a planar surface on the rear face of the panel 11. If found necessary or desirable, a rigid backing of perforated plywood or the like may be affixed to the rear face of the panel 11 in order to prevent buckling or cracking thereof.

The present formation of the target panel provides for extremely economical manufacture, in that the forming operations are simple, and waste of material is reduced to a practical minimum. In the formation of the panel, a square sheet of cork may be cut out and imprinted with the target design to comprise the target face 15. A second sheet of cork of similar dimensions to the first-mentioned sheet may then be stamped out in accordance with the target design, and, similarly, a third sheet with like facial dimensions and of reduced thickness may also be stamped out in accordance with the target design. These stampings will comprise the layers 18a and 19b, and 19a and 18b, respectively. The foil elements 17 may similarly be stamped out from a continuous sheet of metal foil either separately or after assembly with the cork sheeting.

The casing 12 is adapted to firmly support the panel 11. To this end, the casing comprises a backing plate 22 suitably constructed of wood or similar material which will not harm the point of the dart should the dart pass entirely through the panel and penetrate the backing plate. The plate 22 is provided with bottom and side

walls 23a and 23b, respectively, which are dimensioned to snugly embrace the respective bottom and side edges of the panel 11 so that it will nest neatly within the side walls. The bottom wall 23a is provided with an upwardly extending lip 24 to form an elongated guideway for the reception of the bottom edge of the panel 11, as clearly illustrated in Fig. 7.

In order to lock the panel securely against the backing plate 22, a locking member 25 is provided which is rabbeted at its lower surface as indicated at 26 in Fig. 7 in order to seat against the upper edge of the panel 11 and against the upper extremity of the face 15, thus precluding both upward and outward displacement of the panel from the guideway formed by the lip 24. The lower face of the locking member 25 is provided adjacent the outer extremities of the face-confronting edge thereof with a pair of apertures 27 for a purpose more fully described hereinafter, and the outer surface 28 is provided adjacent its ends with elongated slots 29 which are adapted to receive the stems of locking screws 30 to firmly hold the piece 25 in position on the casing. In assembly, the rabbeted portion 26 of the piece 25 is seated against the upper edge of the panel 11 and the piece is swung into engagement with the locking screws 30 which may then be tightened to secure the piece 25 and the panel 11 in their proper positions.

To protect the side edges of the panel 11 and the sides 23b, side pieces 32 are provided each having at their upper extremity a projecting lug 33 which will engage in the recess 27 of the piece 25 described above. The lower extremity of the side piece 32 is beveled as indicated at 34 to seat against the beveled end 35 of the lip 24. Adjacent the lower end of each side piece 32, a slot 36 is provided to receive the shank of a locking screw 37. Thus, to assemble the side pieces 32 to the casing 12, the lugs 33 are inserted into apertures 27 and the side pieces 32 are pivoted about the lugs until the ends 34 engage the ends 35 of the lip 24. The locking screws 37 are then tightened to lock the side pieces securely against the panel.

A reverse procedure may be used to release the panel from the framework, it being apparent that the procedure is extremely simple and expeditious. The locking screws 30 and 37 are preferably provided with plastic heads which will not damage the dart should it inadvertently come into contact therewith. Thus, the entire exposed surface of the framework adjacent the panel is of a material that will not damage the dart should it miss the target panel. It is to be noted that the panel 11 seats flush against the backing plate 22 so that the panel is reinforced against deformation over the entire target area.

To provide for electrical indication of the dart position, a signaling device is incorporated in the framework. In the present instance, the signaling device comprises a series of light bulbs 41 which will be selectively energized by the dart 13 piercing the target. In the present instance, each bulb is separated from the adjacent bulb by a side wall 42 which extends outwardly into contact with a face plate 43. The face plate 43 is preferably formed of plastic or other suitable transparent material and is provided with an indicating mask 44 which comprises, in the present instance, a numeral for each bulb 41. It will be appreciated that any suitable indicator might be employed without departure from the principle of the invention.

Electrical connection between the elements 17 and 16 of the panel and the light bulbs 41 is provided by a series of pins 45 and 46, respectively, which project from the backing plate 22 and are adapted to penetrate the panel 11 as clearly illustrated in Fig. 7. The pins 45 are adapted to project outwardly from the backing plate a distance less than the distance between the element 16 and the rear face of the panel, but greater than the distance between the elements 17 and the rear face, thus insuring contact solely with the elements 17. More than one such pin 45 or 46 may be provided for contact with the respective elements as may be desired or necessary to insure proper electrical connection between said elements and the light bulbs. The pins are held in adjusted position by suitable lock nuts 47 shown in Fig. 7. The pin 46 is likewise adjustable in the backing plate 22, but is positioned to pierce the element 16 at a point overlying the recess 21 described above. The recess 21 is cut into the panel 11 in order to preclude electrical

connection between the pin 46 and the adjacent foil element 17. It will be seen, therefore, that when the panel 11 is properly positioned in the framework 12, the pin 46 will establish operative electrical connection with the element 16 and the several pins 45 will each operatively connect with the corresponding element 17. The pinned connection affords ready assembly and release of the panel in the framework and is substantial proof against functional deterioration, in that the pins are not subject to distortion after prolonged periods of use.

To provide for selective energization of the light bulbs 41, an electrical circuit is provided as represented diagrammatically in Fig. 8. The circuit comprises a source of voltage 50, in the present instance a transformer connected across the suitable source of line voltage. One terminal of the source 50 is connected through a conductor 51 to the pin 46 and the other terminal is connected through a conductor 52 to one side of the parallel series of bulbs 41. The other side of each bulb is then connected by a conductor 53 to a corresponding pin 45.

With reference to Fig. 3, in the operation of the game set, a dart 13 is thrown at the target panel 11 and pierces the panel, for example, in the outermost target area. The metal point of the dart will, therefore, establish electrical communication between foil elements 16 and 17, to energize the signal device 41 from the source of voltage 50. The current path through the device 41 is as follows: From one side of the voltage source 50, the current flows through the conductor 51, the pin 46, the element 16, the metal point of the dart 13, the element 17, the pin 45, the conductor 53, the bulb 41 and the conductor 52 to the other side of the source 50. Energization of the bulb will illuminate the masked face plate 43 to indicate a suitable numerical score to be accredited to the player by reason of the dart's piercing the target at that point.

The present invention is not confined to the specific target design illustrated and described above, but any design may be incorporated therein without departure from the principle of the invention. A modified target design is illustrated in Figs. 12 and 13, wherein a diagrammatic representation of a baseball diamond is employed. As illustrated in Fig. 13, the panel 61 is laminar in structure comprising an outer layer of cork 62, a foil element 63 underlying the entire outer layer, a second layer of cork staggered in thickness to correspond with the design on the face of the panel 61, a series of foil elements 65 corresponding in contour with the design on the face of the panel, and a backing layer of cork 66 staggered in thickness conversely to the staggered thicknesses of the layer 64 so that the rear face of the panel is substantially planar. Suitable pins 67 and 68 are arranged in a backing plate 69 to contact the foil elements 63 and 65 in a manner similar to the engagement of the pins 45 and 46 with the elements 16 and 17. The pins may be connected to a suitable voltage source 70 through a series of signal devices 71 as indicated schematically in Fig. 13.

Other target designs may be utilized by slight modification of the set, and the invention, as defined in the appended claims, is not deemed to be limited to the specific form and construction illustrated and described herein.

I claim:

1. A target panel for electric game sets comprising a target face divided into a plurality of target sections, an electrical contact element coextensive with and common to all of said sections, and a series of second electrical contact elements each spaced from said first element and coextensive with one of said target sections, the adjacent elements of said second series being disposed in relatively offset parallel planes to provide electrical insulation therebetween.

2. A dart-penetrable target panel for electric dart games comprising a front target face divided into a plurality of target sections, an electrically conductive foil contact element underlying said face and coextensive with and common to all of said target sections, a series of second electrically conductive foil contact elements each spaced from said first element and conforming in contour with and underlying one of said target sections, a series of electrically non-conductive spacer elements interposed between said first and second foil elements and conforming respectively to the shapes of the latter, the adjacent ele-

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ments of said series of spacer elements being of different thicknesses to provide electrical insulation between adjacent foil elements of said series of second foil elements, and a series of backing elements each conforming with and underlying one of said elements of said series of second foil elements and being of correspondingly different thickness with respect to adjacent elements of said series of spacer elements to provide a plane surface constituting the rear target face.

3. A dart-penetrable target panel for electric dart games comprising a target face divided into a plurality of target sections, an electrically-conductive contact element underlying said face and coextensive with and common to all of said target sections, a series of second electrically-conductive contact elements each said element of said series of said second elements being spaced from said first element and conforming in contour with and underlying one of said target sections, a series of electrically non-conductive spaced elements interposed between the respective elements of said first and second series of conductive elements, and conforming respectively to the shapes of the latter, the adjacent elements of said series of spacer elements being relatively staggered in thickness to provide for electrical insulation between adjacent second conductive elements.

4. A dart-penetrable target panel for electric dart games comprising a front target face divided into a plurality of target sections, an electrically conductive foil contact element underlying said face and coextensive with and common to all of said target sections, a series of second electrically conductive foil contact elements each spaced from said first element and conforming in contour with and underlying one of said target sections, adjacent elements of said series of said second foil elements being relatively offset to provide for electrical insulation therebetween, and a series of backing elements each element of said series of backing elements conforming with and underlying one of said elements of said series of second foil elements, and being of correspondingly different thickness corresponding to the offset spacing of said elements of said series of second foil elements to provide a plane surface constituting the rear face of the panel.

5. In an electric game set, a target panel comprising a target face divided into a plurality of target sections, an electrical contact element coextensive with and common to all of said sections, a series of second electrical contact elements, each spaced from said first element and coextensive with one of said target sections, and means to insulate said second elements relative to one another and to said first element; and a casing for said panel comprising a backing plate, means to retain said panel flush against said plate, and electric circuit means including a source of voltage, a first contact member adapted to electrically connect with said first-mentioned electrical element, a series of second contact members adapted to respectively electrically connect with said series of second electrical elements, a series of electrical signal devices respectively connected at one side to said series of second contact members and commonly connected at the other side to said first contact member through said source

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of voltage, said contact members consisting of pins imbedded in said backing plate and adapted to penetrate said target panel to effect said electrical connection, and means to adjust said pins longitudinally to regulate the depth of penetration so as to insure proper contact with said electrical elements.

6. In an electric game set, a target panel comprising a target face divided into a plurality of target sections, an electrical contact element coextensive with and common to all of said sections, and a series of second electrical contact elements, each spaced from said first element and coextensive with one of said target sections, the adjacent elements of said second series being disposed in relatively offset parallel planes to provide electrical insulation therebetween, a casing for retaining said panel, and electric circuit means including a source of voltage, a first contact member in said casing adapted to contact said first-mentioned electrical element, a series of second contact members in said casing adapted to respectively contact said series of second electrical elements, and a series of electrical signal devices respectively connected at one side to said series of second contact members and commonly connected from the other side through said source of voltage to said first contact member.

7. In an electric game set, a readily removable target panel comprising a target face divided into a plurality of target sections, an electrical contact element coextensive with and common to all of said sections, and a series of second electrical contact elements, each spaced from said first element and coextensive with one of said target sections, the adjacent elements of said series being relatively offset to provide for electrical insulation therebetween, and a casing comprising a backing plate for said panel, means to releasably retain said panel flush against said plate, and electric circuit means including a source of voltage, a first contact member adapted to contact said first-mentioned electrical element, a series of second contact members adapted to respectively contact said series of second electrical elements, a series of electrical signal devices respectively connected at one side to said series of second contact members and commonly connected from the other side through said source of voltage to said first contact member, said contact members constituting pins imbedded in said backing plate and adapted to penetrate said target panel to effect said electrical contacts, when the panel is retained against said plate.

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