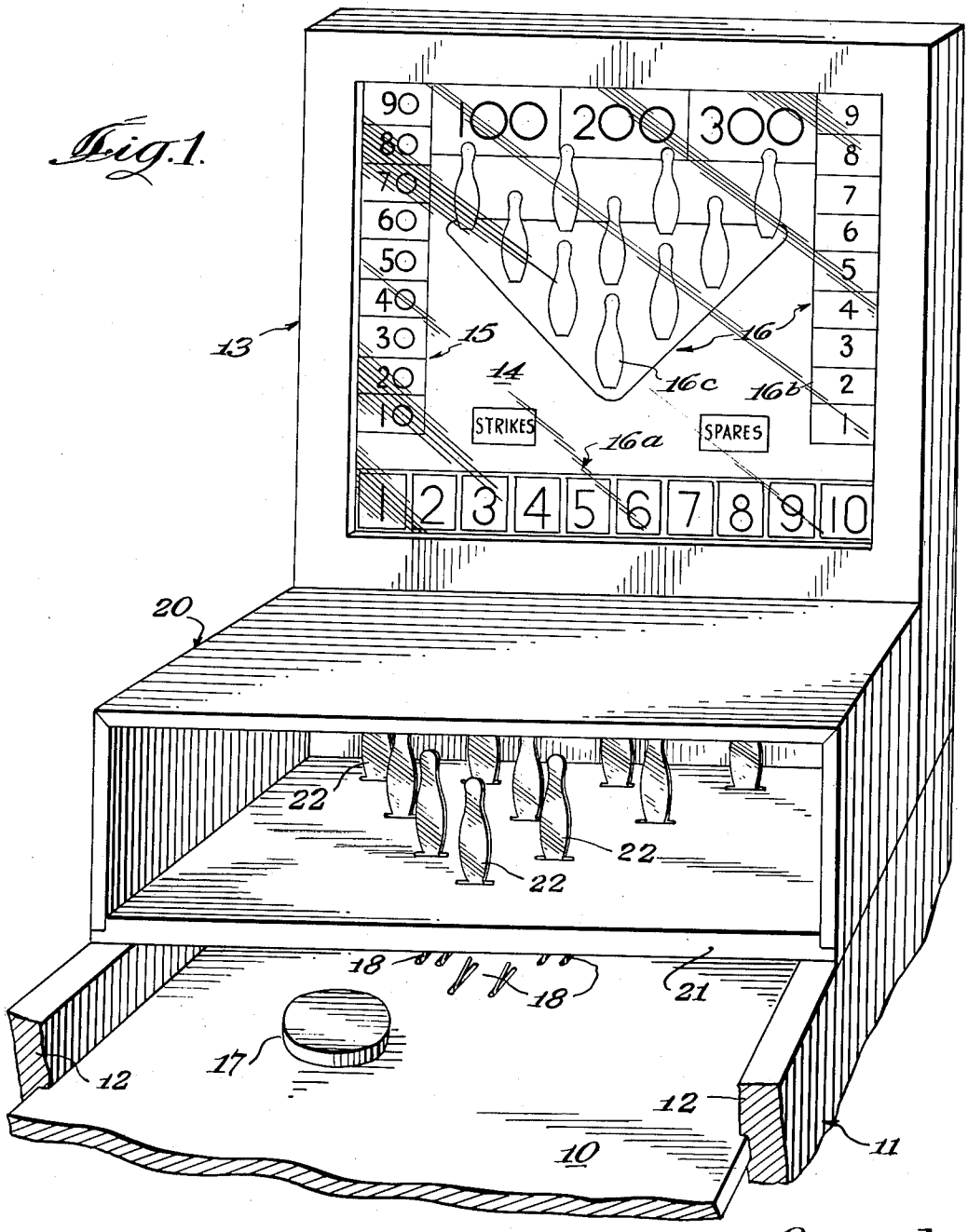
Nov. 1, 1955 F. G. NICOLAUS 2,722,421

LUMINESCENT GAME TARGET

Filed March 20, 1950 2 Sheets-Sheet 1

Fig. 1.



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Fig. 6.

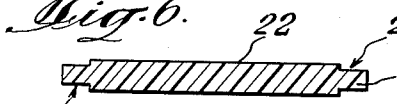


Fig. 7.



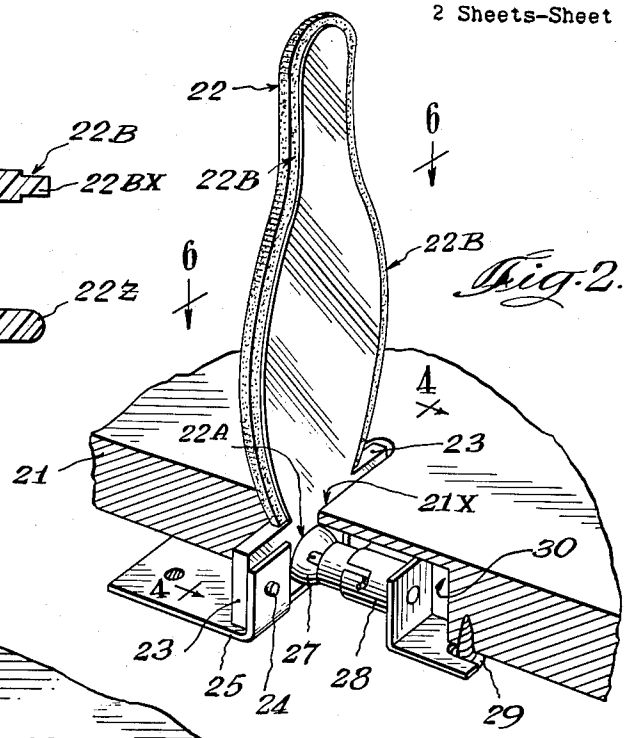


Fig. 2.

Fig. 3.

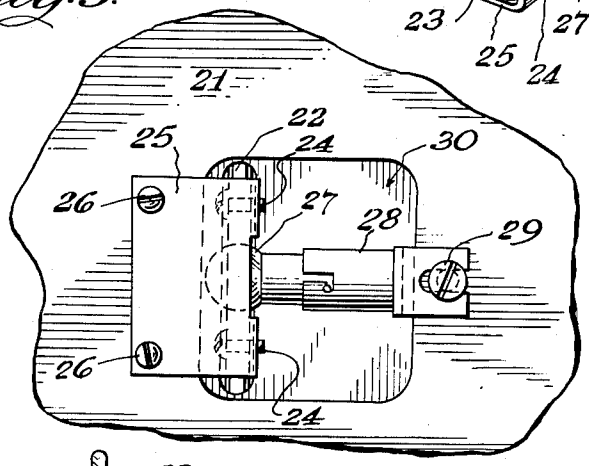
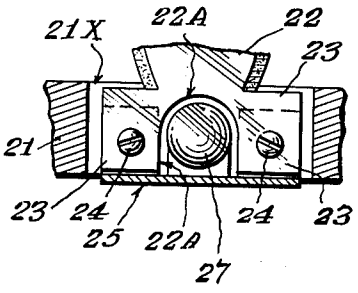


Fig. 4.



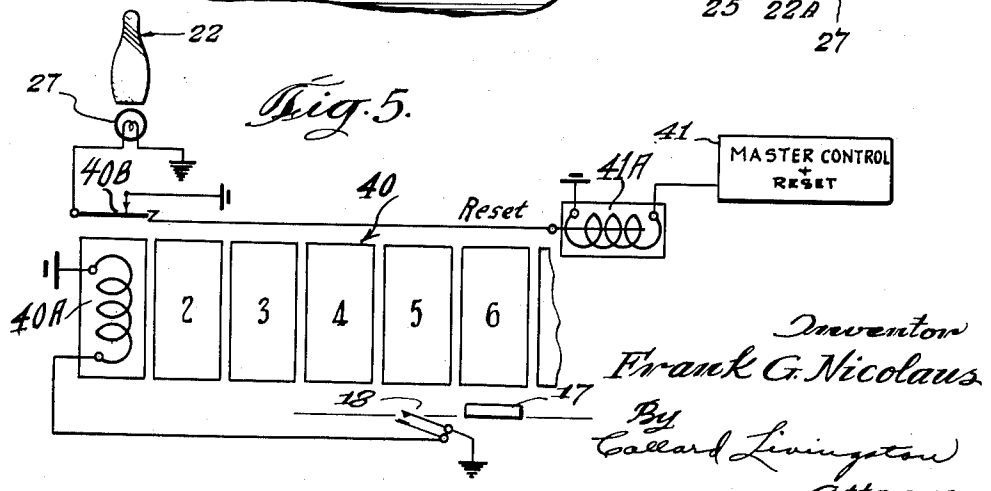


Fig. 5.

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LUMINESCENT GAME TARGET

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Application March 20, 1950, Serial No. 150,580

6 Claims. (Cl. 273—126)

This invention has as its principal object the provision of improvements in game apparatus, and particularly but not exclusively bowling games or the like using target members, such as ten pins, at which a player projects a ball puck, or the like, for score purposes.

One of the detailed objects is the provision of an illuminated target element, particularly a bowling pin, which is outlined in its marginal or edgewise contours by light transmitted edgewise through the target member or bowling pin, as the case may be.

Another object is the provision in a bowling or like game, of a set of ten pins formed of transparent plastic, the pins being housed in a shadow box, and each pin being individually illuminated by internal light transmission to outline its shape by an edgewise glow giving a remarkable effect of a set of standing pins in the shadow box.

Another object is the provision of scoring switches in association with each illuminated pin and actuated by a playing piece, such as a puck, to effect extinction of the light source for each associated pin to cause the pin outline to disappear and give the effect of a pin knocked over.

A further object is the provision of a conversion unit including a shadow box and set of edgeglow pins adapted to be installed upon a shuffle board having electric score control means.

Additional objects and aspects of novelty pertain to details of construction and operation of the embodiment described hereafter in view of the annexed drawings, in which:

Fig. 1 is a fragmentary front perspective view of a shuffle type bowling game having installed an edgeglow pin set and conversion unit;

Fig. 2 is an enlarged perspective detail of one of the edgeglow bowling pins and mounting means therefor;

Fig. 3 is a bottom plan view of the pin of Fig. 2;

Fig. 4 is a fragmentary vertical elevation of a pin bracket looking along lines 4—4 of Fig. 2;

Fig. 5 is a schematic circuit diagram for control of the pin lights;

Figs. 6 and 7 are cross-sections of the edgeglow pins respectively illustrating different forms of edge contours for producing the edgeglow effects, the section of Fig. 6 being taken along lines 6—6 of Fig. 2.

One form of game to which the invention is applied is depicted in Fig. 1, which discloses the rearward end of an elongated shuffleboard **10** mounted in a cabinet **11** between side walls **12**.

At the rearmost end of the game is an upright light box **13** having a score panel **14** with various score indicating numbers **15** and pin score indicia **16**.

The shuffleboard **10**, in practice, may be eight or more feet long, and its surface is highly polished and waxed so that the player may hurl or slidably propel a playing piece or puck **17** rearwardly with the object of striking a number of objectives such as the pin scoring switches **18**.

The pin switches in the illustrative game are spotted

in much the same manner as the ten pins in a regulation bowling game.

The object of the player is to score hits on the pin switches in much the same manner as in actual bowling, the score being indicated by illumination of lights behind the score panel **14**, which indicates the "frames" played, the numbers **16***b* of the pins struck, "strikes," "spares," and at certain times a light-up, as at **16***c*, of the spotted pins.

Electrical switch and control apparatus (not shown in detail) is provided to control the light-up of the score panel according to the player's scoring.

The game structure thus far described is known in the art, and does not per se constitute the invention, except insofar as the hereinafter described novelties are employed in combination therewith.

One of the features of the invention is the provision (Fig. 1) of a shadow box **20** dimensioned to fit down upon the sidewalls **11**, flush with the sides and backbox of the cabinet, with the bottom wall **21** of the box spaced above the shuffle alley **10** to permit free movement of the puck **17** therebeneath for scoring engagement with the score switches **18**.

Within the shadow box **20** are ten target elements **22** in the shape of bowling pins and spotted in the conventional bowling array (e. g. like the delineations **16***c*), each said pin being positioned above its corresponding scoring or pin switch **18**.

The construction of the pins **22**, as depicted in Fig. 2, is another feature of the disclosure, said pins being made of transparent plastic of the class of polystyrene, or any analogous substance having suitable light transmitting properties and capable of producing edgeglow by interiorly transmitted light projected edgewise thereinto.

The main upper portion of the playing piece in this example is in the outline shape of a conventional ten pin, but has a lower transversely extended mounting foot **23** fitting down into a slot **21X** in the floor **21** of the light box, where said foot is attached, as by screws **24**, to a bracket **25** (see also Fig. 4), secured as at **26** (Fig. 3) to the underside of floor **21**.

As best shown in Fig. 4, the foot portion **23** of each pin **22** is provided with a central, rounded opening or cut-out **22A** into which fits the bulb of a lamp **27**.

The lamps **27** are mounted in sockets **28** (Figs. 2 and 3), secured by screws **29** to the underside of the box floor **21**, and each lamp and its socket fits into a routed recess **30** in the underside of the floor.

In one preferred form, each of the pins is provided with marginal edgeglow formations **22B** (Figs. 2 and 6) delineating the outline of the playing piece, in this instance a bowling pin. This marginal formation **22B** consists in cutting grooves, preferably into each face of the pin, along its border or edge, so as to leave the marginal flange **22BX** of reduced thickness delineating the contour or outline of the object.

Said flanges **22BX** are roughened by ordinary routing or relieving tools sufficiently to produce a very satisfactory edgeglow effect. But if the pins are cast with the marginal flanges or reliefs **22B**, **22BX**, precautions should be taken to have these parts leave the mold with roughened surfaces, or to treat and roughen these parts subsequently.

In Fig. 7 is shown another edge formation **22Z** made on a radius and roughened to produce edgeglow effects. However, the radial limitations are not present in the embodiment of Fig. 6, and the marginal lighting effects can be much more pronounced.

It should be remarked that the pin and luminosity means of Fig. 2, when viewed in the shadow box, affords a strikingly realistic effect, notable first, because the entire transparent body of the pin **22** within its marginal

contours, is slightly illuminated to a degree to give the impression of a full-bodied bowling pin when viewed in the darkened interior of the box **20** from the front or playing end of the game.

Moreover, this effect is enhanced by the more brilliant edgeglow borders about the transparent body of the pins, and when the individual light sources or lamps **27** for the several pins are extinguished the effect is that of the complete disappearance of the associated pin, much as though it had been struck over by a bowling ball.

The box **20** and included pins **22** and lamps **27** may be adapted (by suitable dimensioning of the box **20** and spotting of pins **22**) to fit onto any bowling game of the class described for conversion purposes, and the lamps **27** may be connected into existing control and score switch facilities in the manner hereinafter described.

The pins produce an excellent luminescent edgeglow effect when made of an acrylic resin plastic. However, many other materials, including glass, will produce satisfactory luminescent effects.

In Fig. 5, is shown a schematic circuit arrangement to illustrate the lamp control for the several pins through their associated score switches, as applied to a known type of bowling game.

The several pin or score switches **18** are connected through a pin lamp relay bank **40** to operate the conventional relays **40A** thereof and actuate corresponding relay switches **40B** (only one shown) for each of the lamps **27**.

At the beginning of a round of play, or a bowling frame, all of the lamps **27** may be energized through corresponding relay switches in the bank under control of a master circuit control and cycling unit **41** of known type, to actuate among other things reset coil **41A**, and whenever the puck **17** strikes a score or pin switch **18** the corresponding relay in bank **40** trips out or is actuated to extinguish the corresponding lamp **27**, causing the delineation of the corresponding pin **22** to disappear, in effect.

The targets **22** need not be bowling pins, but may assume different shapes to represent other game objectives, and one or any number of such objectives may be employed with suitable circuit means for illuminating and extinguishing the associated lamp means in accordance with a desired scheme of play; and the puck **17** may be replaced by a ball to operate switches **18** as in a conventional ball-rolling game.

Accordingly, I do not wish to be limited to the precise form of construction or arrangement shown, but contemplate the inclusion of all modifications and adaptations fairly coming within the scope of the appended claims.

I claim:

1. In combination with a game of the type including a score switch actuated by a playing piece, and a lamp control circuit having connection with said score switch for operation by the latter, improvements comprising, to wit: a transparent edgeglow objective, a shadow box housing said objective, a lamp mounted opposite an edge portion of said objective to direct light into said edge portion thereof, said lamp connected in said lamp control circuit for illumination and extinction under control of said score switch.

2. In a simulated bowling game, in combination, a shadow box, simulated bowling pins spotted in said box, said pins being formed of a material having the property of conducting light internally and produce edgeglow effects, a lamp operatively associated with each pin and mounted close to an edge thereof to direct light edgewise therein, and circuit means connected to illuminate each lamp and including a score switch for each lamp and having a part disposed on a playing surface adjacent each pin to be engaged and actuated by a playing piece propelled thereat on said surface for extinguishing said lamps to produce an apparent disappearance of any pin when the associated score switch is actuated by said playing piece.

3. In a shuffleboard game of the simulated bowling type having a playing surface over which a playing piece is propelled and spotted bowling pin switches of a type which are actuated by a said playing piece, together with lamp relay means actuated by each pin switch, improvements comprising, namely: a shadow box mounted above said spotted pin switches a distance to permit the playing piece to pass therebeneath, simulated bowling pins spotted in said box and each respectively mounted in aligned vertically-spaced association with one of said switches such that the playing piece may be projected in a direction toward and beneath any said bowling pin to engage and operate the associated switch, said bowling pins each being transparent and of a material capable of transmitting light to produce an edgeglow effect, a pin lamp mounted at the foot of each pin to direct light edgewise into the same, edgeglow formations around the margins of each pin, circuit means normally energizing and illuminating all said pin lamps and circuit means including said pin switches for operation by the latter switches to severally deenergize and extinguish said pin lamps responsive to actuation of the associated pin switch by a said playing piece.

4. For use in simulated bowling game apparatus including a score switch actuated by a playing piece, illuminated objective means including a shadow box, an object standing in said box and comprising a relatively thin body of material shaped in the outline form of a bowling pin and of a character which will transmit light internally from its edges and be rendered luminous thereby, said object having a foot portion shielded from the interior of the box, a lamp directing light into an edge of said body at said foot portion for transmission into the body from the edges of said object, edgeglow surfaces around predetermined marginal portions of said object and exposed to view in said box to provide an edgewise luminous outline of the object in simulation of a bowling pin, and a circuit controlled by said switch for controlling energization of said lamp.

5. A luminescent objective attachment for use with games of the type having a playing surface on which a playing piece is moved and score-switches respectively including switch-operating members at said surface between opposite sidewall portions, for actuation by a said playing piece, said attachment comprising, to wit: a panel of a length and width to be supported at a predetermined height above said switch-operating members on said sidewall means, said playing piece being of a size capable of passing beneath said panel at said height for engagement with any said switch-operating member, luminescent game objectives respectively mounted in upright position at the upper side of said panel, a lamp for illuminating each game objective and mounted beneath said surface and the appertaining game objective, and means providing operating circuits between said lamps and score switches for controlling energization and deenergization of said lamps and consequent illumination of said game objective by action of said playing piece in actuating said switch-operating members.

6. In amusement apparatus of the type including a playing field over which a playing piece is projected, and control switch devices including operating means therefor situated in said field to be engaged and actuated by a said playing piece skillfully directed thereat, improvements comprising to wit: simulated target elements mounted above said field each adjacent a particular associated one of said control-switch operating means such that a projected playing piece may pass beneath the simulated target element to engage and actuate a said switch-operating means and the appertaining switch device associated therewith, said target elements each comprising a solid body constructed of a material capable of transmitting light internally from an edge surface thereof through the

body thereof to substantially illuminate said body, an electrically controlled light source situated near an edge surface of each said target element body to illuminate the same as aforesaid, means including circuit connections with said associated control-switch devices for controlling operation of said light sources to change illumination of the appertaining simulated target element body as aforesaid, responsive to operation of the appertaining switch device by a playing piece.

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