United States Patent

Barnard

[15] **3,654,710**

[45] **Apr. 11, 1972**

[54] SELECTIVELY ILLUMINABLE TOY

[72] Inventor: **James W. Barnard,** 5927 So. Elizabeth Way, Littleton, Colo. 80120

[22] Filed: **Aug. 7, 1970**

[21] Appl. No.: **61,989**

[52] **U.S. Cl.** .....**35/29 R,** 35/8 R, 46/228, 116/124.4

[51] **Int. Cl.** **A63h 33/26,** H03j 1/04

[58] **Field of Search** .....46/226, 228; 273/1 E; 379/325, 379/379, 380; 40/130 L; 116/124.4, 129 L; 240/1 EL; 35/8 R, 29 R

[56] **References Cited**

UNITED STATES PATENTS

1,138,124	5/1915	Lawrence	340/379 UX
3,118,422	1/1964	McNamara	116/124.4
3,304,627	2/1967	Cella	35/8 R

FOREIGN PATENTS OR APPLICATIONS

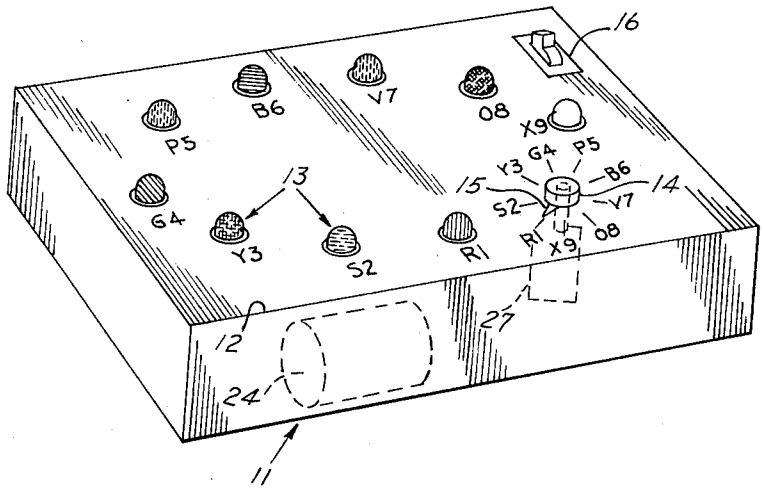
181,453	8/1954	Austria	273/1 E

Primary Examiner—Harland S. Skogquist
Attorney—Reilly & Lewis

[57] **ABSTRACT**

In a toy to amuse and teach hand-eye coordination to children, there is provided a control knob operatively associated with a selected number of distinctive illuminable stations on a display board in such a way that the stations are sequentially illuminated and darkened by the movement of the knob. In one form a rotary switch coupled to the knob sequentially connects power from a battery to a separate light bulb at each station as the knob is turned and indicia is provided on the display board for correlating each station with a knob setting. In another form a light bulb is mounted on a radial arm secured to the knob to rotate to each station as the knob is turned, and in yet another form light from a common light bulb is transmitted to each station via a light-conductive rod coupled to the knob. An on-off power switch on the display board is connected in series between the battery and the light bulb or bulbs.

13 Claims, 8 Drawing Figures



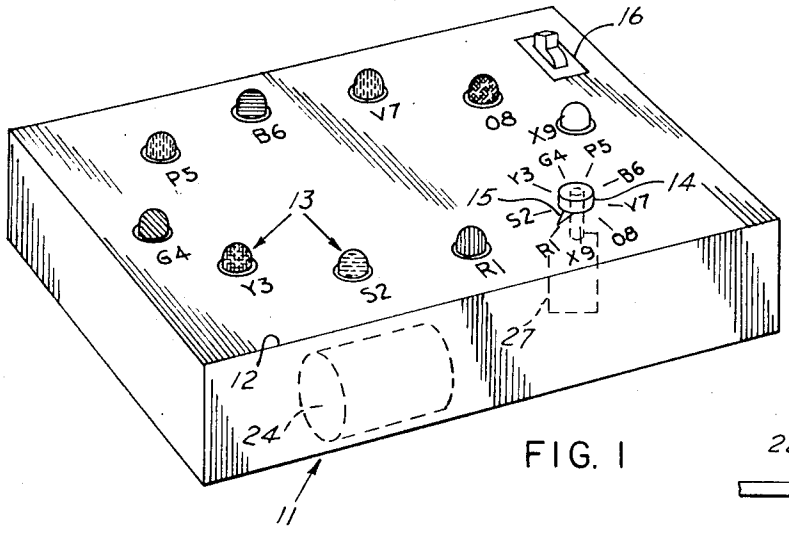


FIG. 1

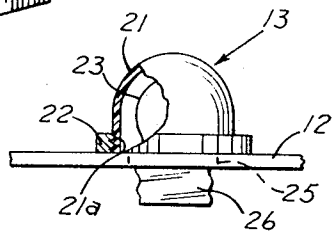


FIG. 2

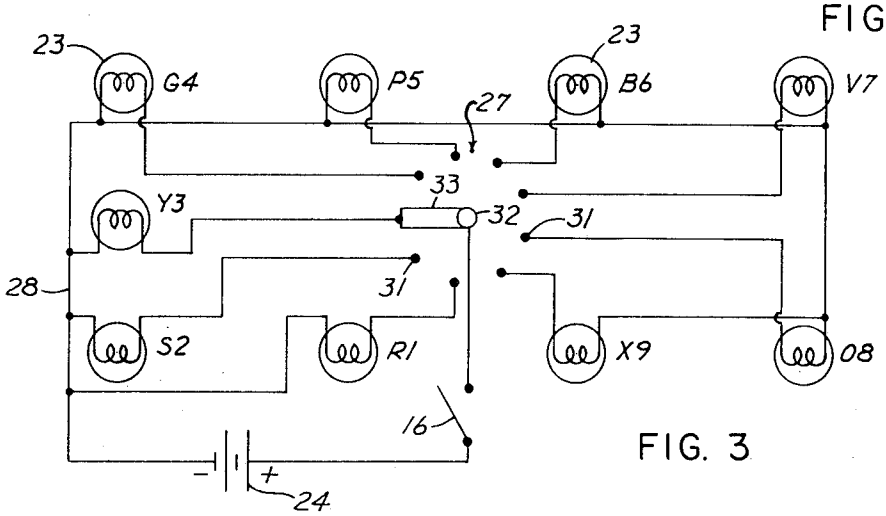


FIG. 3

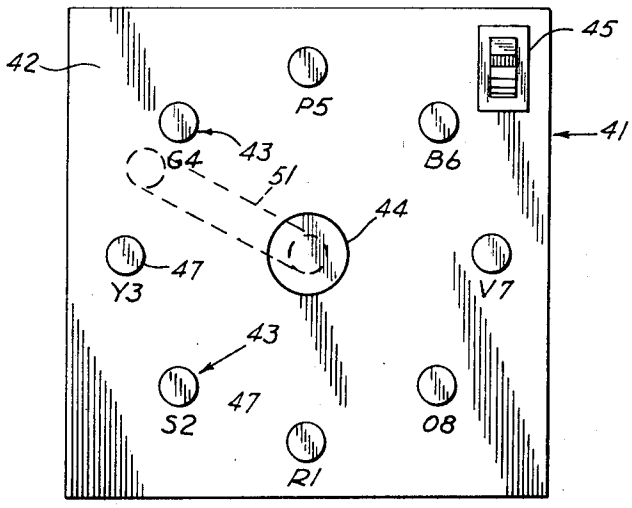


FIG. 4

INVENTOR
JAMES W. BARNARD
BY
Reilly and Lewis
ATTORNEYS

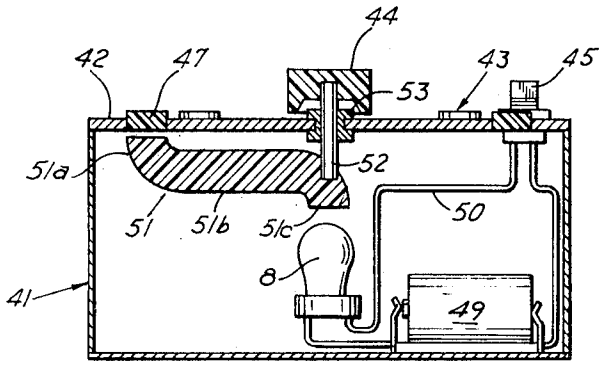


FIG. 5

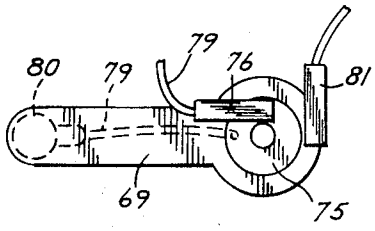


FIG. 8

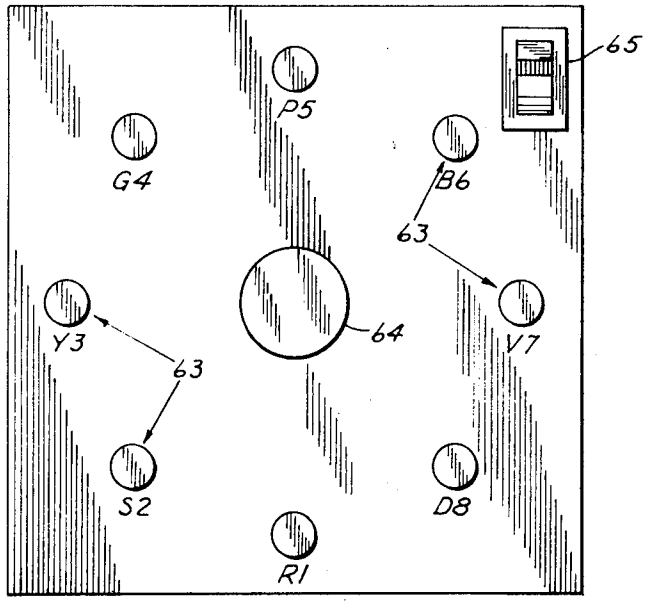


FIG. 6

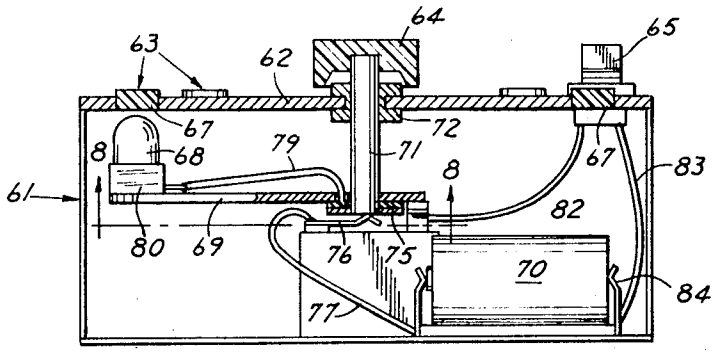


FIG. 7

SELECTIVELY ILLUMINABLE TOY

This invention relates to novel illuminable toy apparatus particularly suited for the amusement of and the teaching of hand-eye coordination to small children.

Children generally seem to be interested in the turning of knobs and at the same time are usually attracted and amused by lighted objects. It has also been observed that significant improvement in a child's coordination can be given to a child by devices which require a child to coordinate one object with another.

Accordingly, an object of this invention is to provide a novel child's toy which is simple, durable and relatively inexpensive to manufacture.

Another object of this invention is to provide a toy to both amuse and teach hand-eye coordination to relatively small children.

Yet a further object of this invention is to provide toy apparatus in which the child may selectively illuminate one of a plurality of stations by turning a knob employing lights, lenses and a low voltage power supply.

In accordance with the present invention in a preferred embodiment there is provided a display board formed as the top of a housing having a plurality of distinctive illuminable stations arranged in a desired pattern on the display board. A rotary control knob mounted on the display board is associated with a light source in such a way that the stations are selectively and sequentially illuminated as the knob is rotated. The stations are defined by lenses of a translucent material which are made distinctive by different colors and associated with apertures in the board. In one form a rotary electric switch sequentially connects power to a light bulb at each station. In another form a radial arm under the board and attached to the knob mounted on the board carries a single light bulb which moves under apertures with lenses in the board, and in yet a third form the light is transmitted by a light-conductive rod to each lens in apertures in the display board. A control switch mounted on the display board permits power from the battery to the light circuits to be selectively turned on or off by the child.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a selectively illuminable toy embodying features of the present invention;

FIG. 2 is a fragmentary elevational view of a station on the display board of FIG. 1 with portions broken away to show interior parts;

FIG. 3 is a schematic electric circuit diagram for the toy shown in FIG. 1;

FIG. 4 is a top plan view of another form of selectively illuminable toy;

FIG. 5 is a vertical sectional view through the center of the toy shown in FIG. 4;

FIG. 6 is a top plan view of yet another form of toy;

FIG. 7 is a vertical sectional view through the center of the toy of FIG. 6; and

FIG. 8 is a bottom plan view of the rotary arm taken along lines 8—8 of FIG. 7.

Referring now to the drawings, the toy shown in FIGS. 1–3 comprises a rectangular housing or casing **11** having a display board **12** forming the top wall thereof. A plurality of distinct illuminable stations each generally represented at **13** are randomly arranged in an elliptical pattern on top of the display board so as to be visible to the user from above the board. A manual control knob **14** having a pointer **15** together with an on-off electric control switch **16** are also mounted on the display board **12** adjacent stations **13** for handy access to the user. While all of the parts are shown on a flat display board in the same plane so as to be essentially co-planar, it is understood that some of them could be mounted on the side walls of the housing.

The top surface of the display board **12** has indicia in the form of a combined letter and number at each station **13** which corresponds to indicia adjacent and circumferentially arranged around the knob **14** to provide for a correlation between each station and a knob setting. The indicia shown from a lower station on the board adjacent the knob and proceeding clockwise is **R1, S2, Y3, G4, P5, B6, V7, O8** and **X9** and the bulbs are shown as being of different colors corresponding to the first letter of the color so that the letters, numbers and colors correlate the knob position to the station. The colors of the stations are **R1** red, **S2** silver, **Y3** yellow, **G4** green, **P5** purple, **B6** blue, **V7** violet, and **O8** orange, and **X9** may be clear. Radial position indicia lines are shown on the display board adjacent the knob **17** which are arranged at circumferentially spaced intervals around the knob and align with the pointer for each letter-number indicia, and these may also be colored to correspond with the letters associated therewith. These indicia will allow the child to correlate a knob setting to a particular illuminable station and thereby serve to teach the child hand-eye coordination.

Each illuminable station is defined by a circular, generally convex lens **21** of a translucent material, preferably plastic, which is shown as covering an aperture **25** in the board and projecting above the top surface of the board. The lens **21** has a lower skirt portion with external threads **21*a*** threading into internal threads in a circular lens socket **22** surmounted on the display board **12**, as best seen in FIG. **2**, which permits the removal and replacement of the lens from the board.

The illumination for each station is provided by an electric light bulb **23** powered by a low voltage storage battery **24** with the bulb being disposed in the aperture **25** in the display board surrounded by the lens socket **22**. The light bulb **23** is shown as being threaded in a bulb socket **26** which may be supported under the display board in a suitable manner. It is understood that other forms of conventional bulb sockets may be used. Energization of each light bulb **23** is controlled by a rotary switch **27** which connects in a series circuit with the battery **24**, the power control switch **16** and each of the light bulbs **23**. The negative or ground side of the battery is connected to a common ground side of each light bulb by a common line **28**.

The rotary switch **27** is of conventional rotary switch structure and comprises a plurality of stationary contacts **31** disposed in a circular pattern with each being electrically insulated from the other, a rotary shaft **32** disposed centrally of the contacts and a radially extending contactor arm **33** mounted on the shaft for conjoint rotation therewith with the free end of the arm being disposed to wipe against the stationary contacts **31**. The control knob **14** is fixedly secured to the upper end of the shaft for conjoint rotation therewith. The shaft **32** provides a common terminal for the rotary switch and is shown as being connected to one side of switch **16**. Each of the stationary contacts **31** forms a terminal which is connected by a separate line **34** with a light bulb so that as the shaft **32** is rotated through a full revolution the contact arm **33** will sequentially engage each contactor **31** and thereby sequentially transmit power from the battery **24** to the light bulbs via control switch **16**. One contact of the rotary switch may be used in place of the control switch **16** by leaving said one contact open. In this way no bulb is energized.

In the operation of the toy, the child will turn knob **14** and rotate shaft **32** and as the shaft **32** is rotated the arm **33** moves from contact to contact and the light bulbs **23** are sequentially energized and with each station being illuminated by light passing through the aperture and lens at each station. The control knob **14** will of course rotate in either direction, allowing the child to select a desired station to be illuminated, and by reading and correlating the indicia on the board at the station and the control knob the child will be able to illuminate a selected station. The power for the lights may be turned on or off at the child's discretion by moving switch **16**.

While the illuminable stations are shown as being in a generally elliptical pattern and arranged to be illuminated in a sequence proceeding clockwise when the switch shaft is turned clockwise, it will be appreciated that the rotary switch arrangement shown in FIGS. 1–3 will permit the illuminable

stations to be located in any position on the display board and wired to a selected one of the stationary contacts **31** of the switch so that the stations do not necessarily have to illuminate in the consecutive sequence shown. It is further understood that the illuminable stations may take a variety of shapes and sizes and that colored bulbs can be used in place of the colored lenses, but the lenses provide color and protect a light bulb.

In an alternative form of illuminable toy shown in FIGS. **4** and **5** there is provided a housing **41** having a display board **42** forming the top wall thereof. A plurality of distinct illuminable stations **43** are shown as being arranged in a circular pattern in the display board. A manual control knob **44** is mounted centrally of the board within the stations and an on-off control switch **45** is mounted in one corner of the display board. The top surface of the display board has the same form of indicia as that above described using R1, S2, Y3, G4, P5, B6, V7, and O8 proceeding clockwise with R1 being in the lower 6 o'clock position and each succeeding station being at 45° intervals.

The stations of this form are defined by a flat lens or disk **47** of a translucent material mounted in an aperture in the board and each preferably colored a different color. The illumination for these lenses is provided by the same light bulb **48** located at a central position in the housing and powered by a storage battery **49** located in the housing. The battery **49**, light bulb **48** and switch **45** are connected in a series circuit by wires **50** in the housing. The light from the bulb is conducted to each station as the knob is being turned, by a fiber-optic rod **51** of a generally S-shape having a downturned inner end **51***a*, a horizontal internal section **51***b* and an upturned outer end **51***c*. The rod **51** is fixedly mounted at the lower end of a shaft **52** supported in a bearing **53** mounted on the display board and carries the control knob at its upper end. In this way, as the knob is rotated the lower downturned end **51***c* of the conductor will remain above the light bulb at all times and the upper upturned end **51***a* will sequentially move under each lens **47** to transmit light through the lens and thereby sequentially illuminate each station. While the pattern of the lenses in this form must be confined to a generally circular array, some variation may be accomplished by enlarging the upper end to the light conductor. The light-conductive rod **51** may be of a lucite material and several bundles may be used if desired for illuminating more than one lens at a time.

In the third form of illuminable toy shown in FIGS. **6–8** there is provided a housing **61** with a display board **62** forming the top wall thereof. Again, a plurality of distinctive illuminable stations **63** are shown on the display board and arranged in a circular pattern. A manual, rotary control knob **64** is mounted centrally of the stations and in the center of the board and an on-off control switch **65** is also mounted on the board. The indicia on the board to identify the stations is again R1, S2, Y3, G4, P5, B6, V7 and D8 and arranged in the same relative positions as the form shown in FIGS. **4** and **5**. Each station is defined by a flat lens **67** of a colored translucent material mounted in an aperture in the display board to receive light from a bulb within the housing.

The illumination for the lenses is provided by a light bulb **68** mounted at the outer end of a radial arm **69** and is positioned so as to move sequentially under each lens, the bulb being powered by a battery **70** in the housing. The arm is supported at its inner end on a vertical shaft **71** mounted in a bearing **72** secured to the display board and has the control knob **64** mounted on its upper end. In this way the control arm and light bulb are supported by the center shaft and motion is transmitted from the control knob to the arm to move the light bulb.

Again the battery **70**, light bulb **68** and control switch **64** are connected in a series circuit and in this form power is connected to the movable light bulb via a slip ring type arrangement. This arrangement includes a conductive disk **75** mounted on the arm under the shaft for rotation with the arm about the axis of the shaft. A resilient conductive contact element **76** connects via a wire **77** and contact element **78** to the positive terminal of the battery **70**. A wire **79** connects from the disk **75** to the socket **80** for the bulb. The socket is connected to the arm **69** which is engaged by another contact element **81** which is at all times in engagement with the arm. A wire **82** connects from this ground contact element **81** to one side of the switch **65** and a wire **83** connects the other side of the switch **65** to the contact element **84** engaging the battery case. In this way the switch **65** opens and closes the ground side of the power circuit to the light bulb to selectively turn the bulb on and off.

Although the present invention has been described with certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.

What is claimed is:

1. An illuminable toy comprising a display board, a plurality of distinctive illuminable stations arranged in a predetermined pattern on said board, each of said stations being defined by an aperture and a lens associated with the aperture in the display board, means for illuminating said stations, and a rotary control knob on the display board operatively associated with said illuminating means so as to sequentially illuminate and darken said stations upon the rotation of said knob.

2. An illuminable toy as set forth in claim **1** wherein each lens is of a different color.

3. An illuminable toy as set forth in claim **1** including a control switch mounted on the display board to regulate said illuminating means.

4. An illuminable toy as set forth in claim **1** wherein said illuminating means includes at least one light bulb mounted under the display board and means to supply electric power to the light bulb.

5. An illuminable toy as set forth in claim **4** including a light bulb for each station and a rotary switch having a separate contact connected to each light bulb with the knob being adapted to move a contact arm over the contacts to sequentially energize and de-energize the light bulbs.

6. An illuminable toy as set forth in claim **5** including indicia means on the board for correlating each station with each setting of said rotary switch.

7. An illuminable toy as set forth in claim **4** including a light-conductive rod connected to the knob to transmit light from the light bulb to each station.

8. An illuminable toy as set forth in claim **4** including a radial arm connected to the knob for rotation therewith and having a light bulb on the end of the arm to sequentially move under each station and electric contact means associated with the arm to connect electric power to said light bulb as said knob is rotated.

9. An illuminable toy comprising a flat display board, a plurality of illuminable lenses in apertures in the board arranged in a predetermined pattern, means for illuminating each of said lenses so as to be visible from above the board including at least one light bulb and an electric battery for energizing said light bulb, and a rotary control knob mounted on the display board for selectively regulating the light from the bulbs to the lenses so as to sequentially illuminate and darken said lenses upon the rotation of said knob.

10. An illuminable toy comprising a housing with a flat display board forming a top wall thereof, a plurality of illuminable lenses arranged in the same plane in apertures in the board in a predetermined pattern, means in the housing for illuminating each of said lenses including at least one light bulb and an electric battery for energizing the light bulb, a rotary control knob mounted on a vertical shaft in the display board for selectively regulating the light from the bulbs to the lenses so as to sequentially illuminate and darken said lenses upon the rotation of said knob, and a control switch mounted on the display board to regulate the energization of the light bulb by said battery.

11. An illuminable toy as set forth in claim **10** wherein the lenses are randomly located on the display board with a light

bulb located under each lens, said illuminating means including a rotary switch with a center shaft coupled to the knob, a contact arm carried by the shaft, a pluraiity of contacts arranged in a circular pattern around the shaft to be engaged by said arm and insulated from one another, each one of said contacts being connected to one of said light bulbs.

12. An illuminable toy as set forth in claim 10 including a generally S-shaped light-conductive member supported on the lower said center shaft for conducting light from the light bulb to each said lens as the shaft is rotated.

13. An illuminable toy as set forth in claim 10 including a rotary arm connected to one end of said shaft with the light bulb mounted on the end of said arm, and means including movable and stationary contact elements from the battery to the light bulb via said arm.

* * * * *