Dec. 14, 1965 H. M. FREEMAN ETAL 3,223,412

MAGNETICALLY ACTUATED DOLL LIGHT

Filed Aug. 13, 1963

FIG. 1.

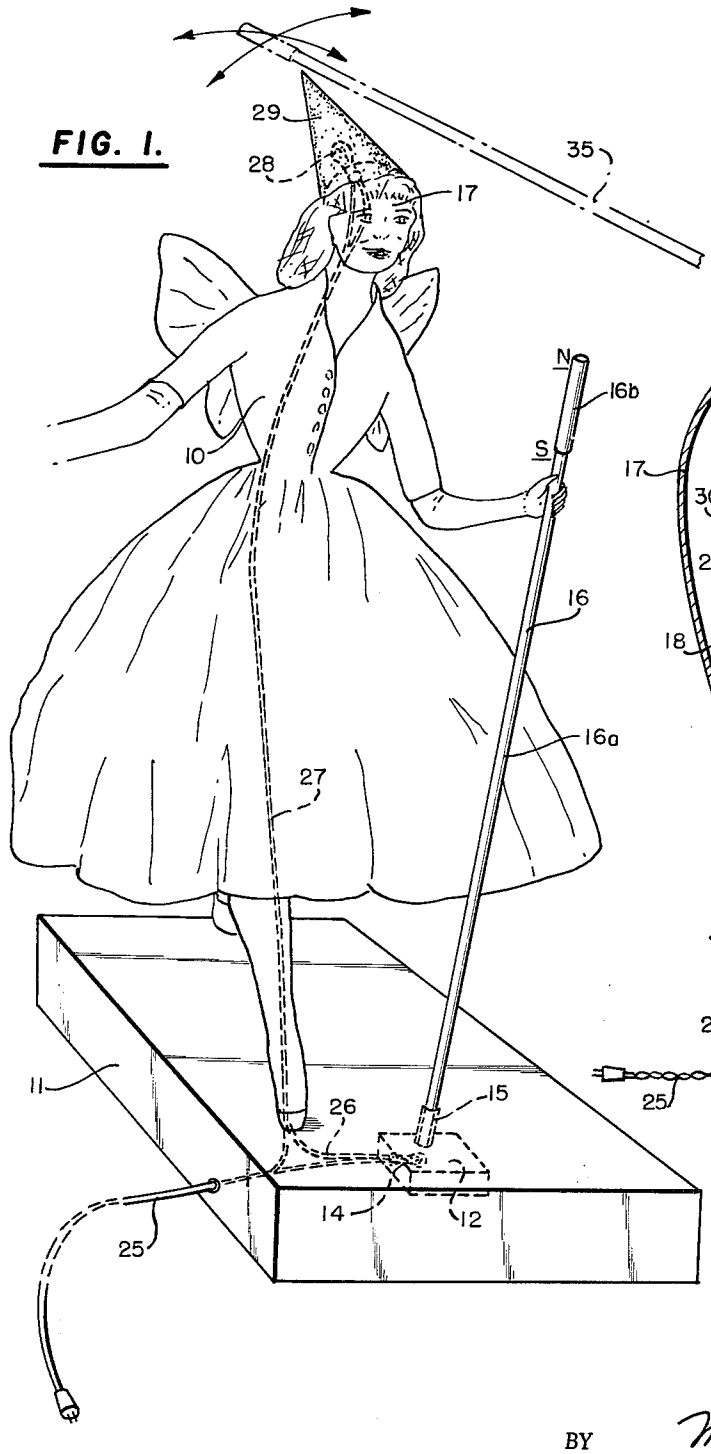


FIG. 2.

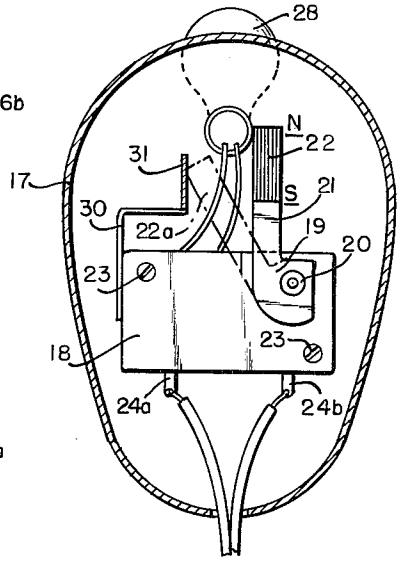
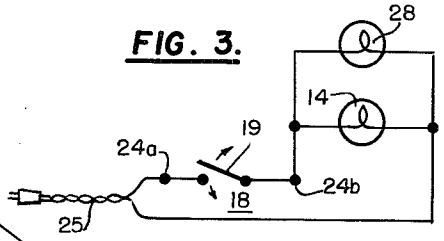


FIG. 3.



INVENTORS
H. M. Freeman
J. F. Toth

BY Moore, Hall & Pollock

ATTORNEYS

United States Patent Office 3,223,412
Patented Dec. 14, 1965

3,223,412

MAGNETICALLY ACTUATED DOLL LIGHT

Harold M. Freeman, Madison Heights, and John F. Toth, Ferndale, Mich., assignors to Inventions, Incorporated, Detroit, Mich., a corporation of Michigan

Filed Aug. 13, 1963, Ser. No. 301,859
5 Claims. (Cl. 272—8)

The present invention relates to electrical circuits of the types employing magnetically actuated switches, and is more particularly concerned with circuits employing concealed switches in association with a novel actuator or operator whereby unusual, pleasing and susprising effects may be achieved.

It is, accordingly, an object of the present invention to provide novel electrical circuit arrangements, particularly a lamp, adapted to be controlled by an external magnetic field.

Another object of the present invention resides in the provision of a lamp comprising a magnetically responsive electric switch member, associated with a magnetic operator member movable to opposing sides of said switch member and further movable adjacent either of said sides to effect a switching operation in either of two opposite directions from either side of the switch member, whereby a far more versatile magnetic switching operation is effected than has been possible heretofore.

A further object of the present invention resides in the provision of a novel lamp adapted to be used as a nursery room lamp, night light, television lamp, or the like; and adapted to be turned on and off by a novel hand-held magnetic actuator.

A still further object of the present invention resides in the provision of improved illumination devices having concealed magnetically actuable switches therein, associated with novel movable magnetic operators for applying an appropriate external attractive or repulsive field to either side of said switch.

The foregoing objects, advantages, construction and operation of the present invention will become more readily apparent from the following description and accompanying drawings, in which:

FIGURE 1 is an illustrative view of the present invention as embodied in a lamp;

FIGURE 2 is an illustrative cross-sectional view of a portion of the lamp shown in FIGURE 1, illustrating the switch arrangement employed therein; and

FIGURE 3 is a schematic diagram of one form of electrical circuit which may be controlled by the arrangement of the present invention.

Referring now to the several figures, like numerals of which identify like parts throughout, it will be seen that the present invention may be embodied in a lamp representative, for example, of a fairy godmother. The lamp itself comprises a doll **10** as its major portion, with said doll **10** thereby acting as an up-right decorative support section. Doll **10** which, in the form illustrated, is intended to represent a fairy godmother, may be mounted upon a sturdy base **11**, e.g., of wood, with the underside of the base **11** including a recess or receptacle **12** in which is mounted a small lamp bulb **14**. The upper side of recess **12** communicates with a socket **15** of elongated configuration adapted to receive and support a "magic wand" **16** comprising an elongated rod **16***a* having an elongated or bar magnet **16***b* of permanent magnetic material at one end thereof. In its preferred form, the rod member **16***a* comprises a flow plastic material whereby light from lamp bulb **14** may be caused to illuminate the length of rod **16***a*.

The doll **10** includes a head portion **17** (shown in cross-section in FIGURE 2) in which is recessed a switch

mechanism **18** preferably taking the form of a momentary contact micro-switch adapted to be actuated by means of an armature **19** rotatably attached at **20** to the switch mechanism. Armature **19** includes a sleeve **21** of non-magnetic material to which a further elongated permanent magnet **22** is attached. Switch **18** is held in place within head **17** of the doll **10** by means of a pair of mounting screws **23**; and electrical connections are made to said switch at a pair of terminals **24***a*, **24***b* which are located electrically in relation to the switch in the manner illustratively shown in FIGURE 3. The terminals **24***a* and **24***b* may further be interconnected to a line cord **25** and, by means of appropriately concealed conductors **26** and **27**, may be also connected to the aforementioned lamp bulb **14** in the base **11**, as well as to a further lamp bulb **28**. Lamp bulb **28** may, as best shown in FIGURES 1 and 2, be mounted in the head **17** of the doll **10**; and said lamp bulb **28** may be concealed from view by means of a removable translucent hat **29** forming a portion of the "fairy godmother" representation.

Switch **18** may comprise a commercially available microswitch, modified in the manner described to incorporate permanent magnet **22** magnetically spaced from the switch casing by means of a non-magnetic sleeve **21**. In accordance with the present invention, moreover, switch **18** further includes a magnetic keeper structure which is positioned adjacent the possible path of movement of permanent magnet **22**, but which is also magnetically spaced from the body of base **11**. To that effect, the keeper comprises a non-magnetic bracket **30** to which is attached a plate **31** of magnetic material; and, accordingly, when magnet **22** is moved from the position shown in full line in FIGURE 2 to the position **22***a* shown in dotted line, the switch is held in that new position **22***a* by the magnetic attraction between magnet **22** and plate **31**, until magnet **22** is somehow forcibly removed from the vicinity of plate **31**.

The switch actuation described is achieved, in accordance with the present invention, by the aforementioned wand **16**. In this respect, the lamp arrangement is such that the wand **16** may be removed from its socket **15** by one operating the lamp, e.g., a child, and then moved along any of many paths relative to all sides of the head **17** of doll **10**, in the manner illustratively shown at **35**.

The full line position of magnet **22**, shown in FIGURE 2, is assumed to be the normal unoperated position for the micro-switch armature; and may be maintained by an appropriate return spring mechanism comprising a portion of the micro-switch. In the course of moving or waving the wand **16**, and particularly the permanent magnet portion **16***b* of said wand, relative to magnet **22** of the micro-switch armature, the said armature may be caused to move from its full line position to the dotted line position **22***a* shown in FIGURE 2. Even if the magic wand then be removed from the vicinity of the doll's head, or even if it be moved along some other path, the attraction between magnet **22** and plate **31** will maintain the switch armature in its dotted line position. Further movement of the wand can, however, effect a forcible separation between magnet **22** and plate **31** whereby the micro-switch spring can then return the micro-switch armature to its original position.

In achieving the foregoing operation, it will be appreciated that magnet **16***b* can operate the switch from either side of the switch, and that either magnetic attraction or magnetic repulsion effects, or both, can be utilized to effect movement of the switch in either of its two possible directions. Merely by way of example, let us assume that bar magnet **22** is so positioned as to define a north pole at its top end and a south pole at its bottom end (this designation having been shown for purposes of illustration

in FIGURE 2). Let us further assume that the bar magnet **16***b* of magic wand **16** includes a north pole at its top end and a south pole at its bottom end, as also shown for purposes of illustration in FIGURE 1. Movement of magnet **22** from its full line to its dotted line position can accordingly be achieved by a magnetic repulsion effect wherein the top of magnet **16***b* is disposed in proximity to the top of magnet **22**, and to the right side of magnet **22** (as viewed in FIGURE 2), or by a magnetic repulsion effect when the bottom of magnet **16***b* is positioned adjacent the bottom right side of magnet **22**; or it may be achieved by a magnetic attraction effect in which the bottom of magnet **16***b* is disposed adjacent the top of magnet **22**, and to the left side thereof, as viewed in FIGURE 2, or by magnetic attraction between the top of magnet **16***b* and the bottom left side of magnet **22**.

Thus, movement of magnet **22** from its full line to its dotted line position may be effected from either side of magnet **22** and as the result of four different relative orientations between magnets **22** and **16**. By the same token, movement of the switch from its dotted line to its full line position (in FIGURE 2) can be effected by analogous magnetic repulsion or magnetic attraction effects, e.g., by moving the top of magnet **16***b* into a region adjacent the top of magnet **22**, and to the left thereof. In this respect, of course, the strength of magnets **16***b* and **22** should be chosen in relation to the size and material of magnetic plate **31** that said plate **31** can hold magnet **22** in its dotted line position **22***a* when so placed, but with the force of attraction being sufficiently small that it may be overcome by further movement of magnet **16***b* effected in the manner described.

It will, moreover, be appreciated that the specific magnetic polarities shown in FIGURES 1 and 2 are in no way mandatory, and either or both magnets may be reversed in position without in any way affecting the operation of the device. Indeed, since the essence of the device resides in the unpredictable nature of the movement required to achieve switch operation, the particular magnet polarities becomes totally immaterial. Moreover, it will be appreciated that a wide variety of positions for magnet **16***b* may result in any of the relative magnet orientations described above, thereby enhancing the unpredictable nature of the switching.

In operation, the child or person operating the lamp of FIGURE 1 may remove the wand **16** from its receptacle **15** and then wave or move said wand in various directions, adjacent either or both sides of the head **17** of doll **10**. At some point in this movement, micro-switch **18** will be closed, thereby energizing both of lamp bulbs **14** and **28** (which may comprise, for example, two 6 watt, 110 volt incandescent bulbs wired in parallel). The keeper **31** will serve to maintain the switch in its new position, whereafter wand **16** may be restored to its receptacle **15**. Lamp bulb **14** will, at this time, illuminate the shaft **16***a* of the wand, while lamp bulb **28** will provide further illumination via the translucent hat **29** of the doll, thereby giving an interesting and pleasing form of illumination. When it is desired to turn the lamp off, the wand **16** may again be removed from its receptacle **15** and again waved or moved in the manner described relative to the doll's head, thereby causing the microswitch armature to be restored to its original position, either as a result of magnetic attraction or magnetic repulsion, depending upon the particular wand movement. This will in turn deenergize both of lamp bulbs **14** and **28**.

Various modifications may be made, without departing from the principles of the present invention. By way of example in FIGURE 3, lamp **14** has been illustrated as separated from line cord **25** by means of switch **18**. If desired, lamp bulb **28** may be positioned in the manner shown in FIGURE 3, whereas lamp bulb **14** may be connected electrically to the left of switch **18**, i.e., directly across line cord **25**. This will result in the lamp bulb **14** being continually energized whereas lamp bulb **28** is

energized or deenergized in dependence upon the operation of switch **18**; and this will in turn result in the entire length of flow plastic rod **16***a* being always illuminated whenever the wand is placed in socket **15**, whereby the magic wand can always be seen by one desiring to operate the lamp bulb **28**. Other variations, and other uses for the novel switch and operator of the present invention, will become apparent to those skilled in the art. It must, therefore, be understood that the foregoing description is meant to be illustrative only, and all such variations and modifications as are in accord with the principles described are meant to fall within the appended claims.

Having thus described our invention, we claim:

1. A magnetically actuated doll light comprising a doll-shaped supporting structure including a base portion, lamp means attached to said supporting structure, means for selectively actuating said lamp means comprising electrical switch means concealed within said supporting structure, said switch means including a movable armature to actuate said switch means and having first movable permanent magnet means attached thereto for altering the position of said armature thereby to vary the energization state of said lamp means, said first permanent magnetic means being attached to said armature by non-magnetic means adapted to magnetically space said first permanent magnet means from said switch means, magnetic keeper means disposed at a fixed location adjacent the path of possible movement of said first magnet means, said keeper means comprising a body of magnetic material attached to and magnetically spaced from said switch means by further non-magnetic means, said keeper means being positioned for selective engagement with said first magnet means during alterations in the position of said armature, and operator means for selectively moving said first permanent magnet means toward and away from said keeper means thereby to alter the position of said armature, said operator means comprising an elongated wand mounted upon a portion of said supporting structure and completely removable therefrom to permit said wand to be manually varied in position in a random fashion adjacent the exterior of said supporting structure, at least a portion of said wand including second permanent magnet means adapted to interact magnetically with the field of said first magnet means during said random variations in position of said wand.

2. The device of claim **1** wherein said supporting structure includes holder means adapted to removably receive and retain said wand, and lamp means carried by said supporting structure adjacent said holder means for illuminating said holder means and the wand retained thereby.

3. In an illumination device, a supporting structure comprising a doll shaped member mounted upon a base portion, lamp means attached to said supporting structure, means for selectively actuating said lamp means comprising electrical switch means disposed within the head of said doll shaped member, said switch means including a movable armature having a first movable permanent magnet means attached thereto operative to actuate said switch means thereby to vary the energization state of said lamp means, and operator means for selectivity moving said first permanent magnet means to alter the position of said armature, said operator means comprising an elongated wand of flow plastic material having one end adapted to be removably mounted upon the base portion of said supporting structure, said lamp means including means within said base portion for illuminating said flow-plastic wand when said one end of said wand is mounted upon said base portion, said wand being completely removable from said base portion to permit said wand to be manually and randomly varied in position adjacent the exterior of said doll head, the other end of said wand including second permanent magnet means adapted to interact magnetically with the field of said first magnet means through the head of said doll during said random variations in position of said wand.

4. The device of claim 3 wherein said lamp means comprise a pair of bulbs electrically connected in parallel, one of said bulbs being located within said base portion and the other said bulbs being located within said head portion, and circuit means interconnecting said pair of bulbs to said switch means whereby said switch means controls the energization state of both said bulbs simultaneously and in like fashion.

5. The device of claim 3 wherein said switch means comprises a casing having a non-magnetic bracket thereon supporting a body of magnetic material in magnetically spaced relation to said casing adjacent the path of movement of said first magnet means, whereby said body is adapted to act as a keeper for selectively maintaining said armature in a predetermined position.

References Cited by the Examiner

UNITED STATES PATENTS

2,716,699	8/1955	Boden	46—226 X
2,749,663	6/1956	Lemelson	46—236
2,932,917	4/1960	Patane	46—228

RICHARD C. PINKHAM, *Primary Examiner.*