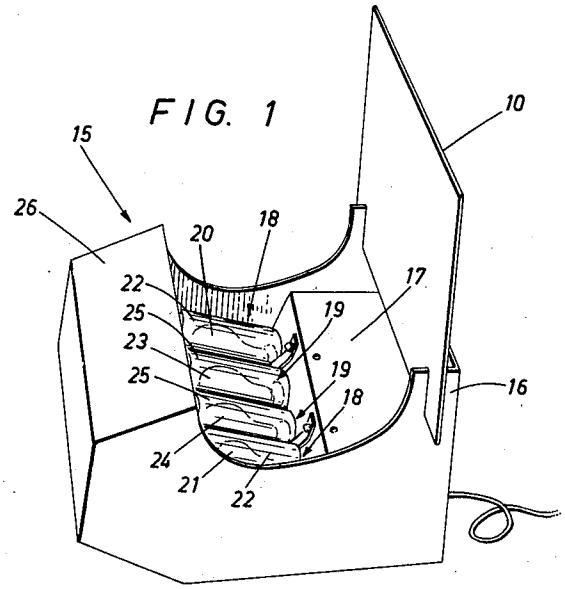
Nov. 3, 1964 C. P. SAILA 3,154,871

ANIMATED DISPLAY SIGN

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FIG. 1



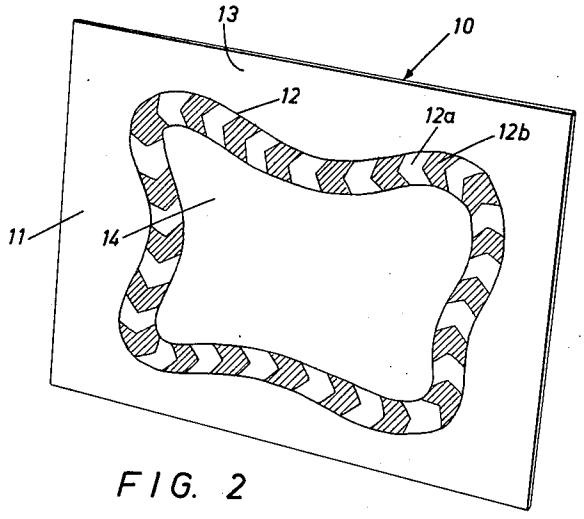


FIG. 2

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ANIMATED DISPLAY SIGN

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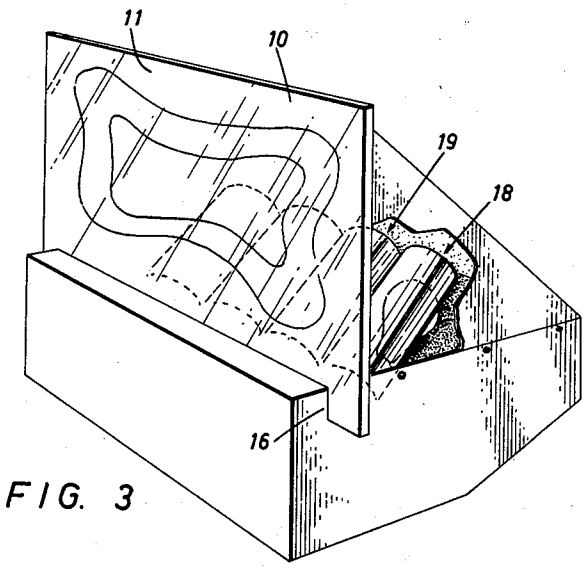


FIG. 3

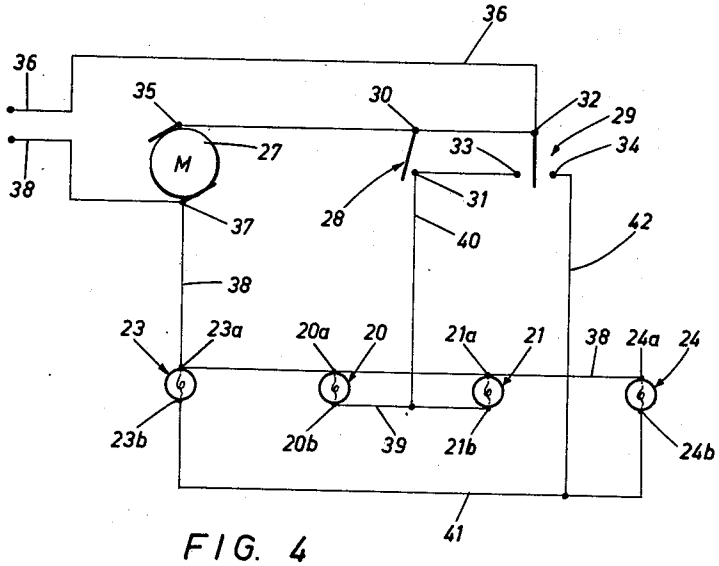


FIG. 4

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Nov. 3, 1964 C. P. SAILA 3,154,871

ANIMATED DISPLAY SIGN

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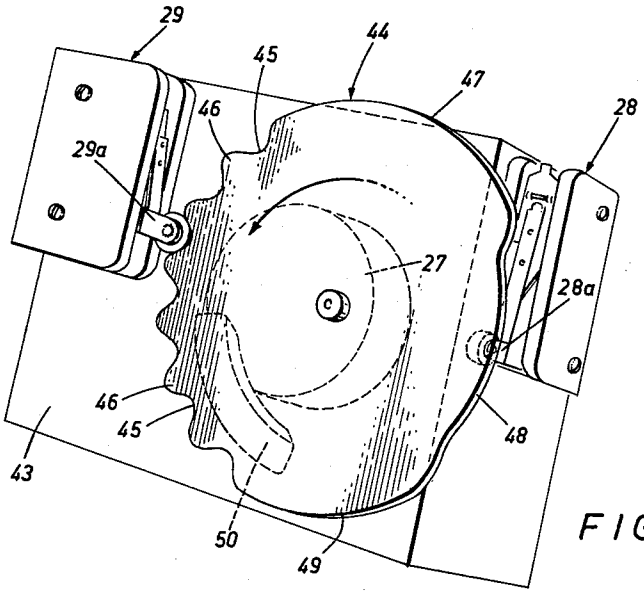


FIG. 5

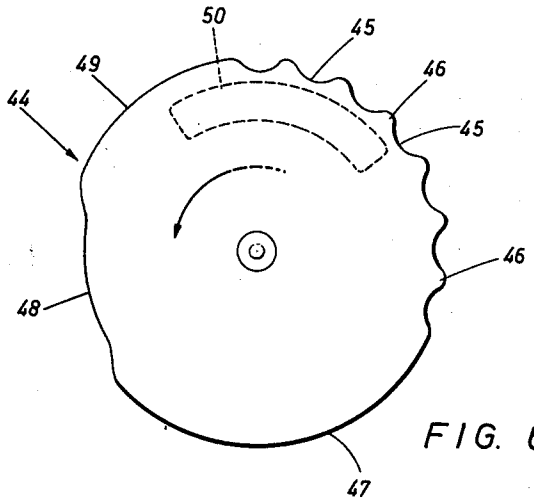


FIG. 6

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United States Patent Office 3,154,871
Patented Nov. 3, 1964

3,154,871

ANIMATED DISPLAY SIGN

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Filed Oct. 19, 1961, Ser. No. 146,222
1 Claim. (Cl. 40—130)

This invention relates to animated display signs. More particularly, this invention relates to display signs of the type in which the illusion of motion of parts of the sign in the mind of an observer is created by illuminating the signs in a particular sequence by light casting devices which are adapted to illuminate the signs in a particular sequence.

Examples of animated display signs of the general type to which my invention relates are disclosed in the following United States Patents: 2,040,538, dated May 12, 1936, issued in the name of Nelson Perry Smith for Animated Sign and Method of Operating It; 2,043,200, dated June 2, 1936, issued in the name of Garrett B. Linderman, Jr. for Animated Sign and Method of Operating It; 2,137,127, dated November 15, 1938, issued in the name of John Gordon Best for Animated Sign and Method of Operating It; 2,014,271, dated September 10, 1935, issued in the name of John Gordon Best for Illuminated Sign; and also in Canadian Patents 391,561 and 391,562, each dated October 1, 1940 and issued in the name of John Gordon Best for Animated Sign.

As is set out in detail in the aforementioned patents, animation of display signs of the general type to which my invention relates is dependent upon such factors as the known laws of colour reflection and absorption, colour combinations employed in the indicia on the sign and the background of the sign, colour combinations employed in the light casting devices employed, frequency of cyclic colour changes by the light casting devices, irradiation, chromatic aberration, reflection, absorption, and persistence of vision.

In a large number of the aforementioned patents, animation of the sign is produced only by alternately illuminating the sign with two coloured lights which are deficient in the hues of each other, for example, red and green. If the red and green lights are flashed on and off at a suitable frequency, red and green colours in the sign will be accentuated when the red and green lights respectively are on, and if the red and green colours on the sign are properly disposed with relation to each other, the illusion of animation will be created. However, there is no variation in this sequence or the frequency of alternate illumination, and the red and green are flashed on and off alternately and continuously. In some of the aforementioned patents, for example, 2,040,538, alternative flashing sequences are mentioned. For example, the green light may be kept on continuously and the red light alternated on and off at suitable frequencies, or both the red and green lights may be kept on continuously and polychromatic or orthomatic light alternated on and off at suitable frequencies.

After considerable investigations, experiments and trials, I have discovered a sequence of operation for the light casting devices which not only results in a much better illusion of animation than it has hitherto been able to create in accordance with the teachings of the aforementioned patents, but also results in a considerably more effective display sign from the advertising point of view. In addition, it has been found that the effectiveness of prior art type animated display signs which employ only the repeated steady sequence of alternate flashing of red and green or other coloured lights, from the observer's point of view, lessens materially after only a short time. This is due primarily to the monotony of the alternating

flashes. The sequence of operation of light casting devices employed with my animated display sign has been especially designed with great consideration for the psychological effects produced thereby, so as to provide a sign which holds the attention of the observer for a considerable length of time without the observer becoming bored. In fact, because of the complicated sequence of operations employed, it might well be fair to say that a reasonably intelligent man becomes increasingly interested in the display as the sequence of operations is repeated. This, of course, is the result of natural curiosity on behalf of the observer to comprehend how a particular effect is achieved. It goes without saying, of course, that it is vital in the advertising of wares or services to at least attract the attention of an observer. It is even better to be able to hold the attention of the observer, and, of course, the longer the better. Psychologically, while the two aforementioned characteristics are important, and indeed must precede the third characteristic to be mentioned hereinafter, an ideal display sign is one which has all three characteristics. The third characteristic, which is related to the second, is the ability of the display to appeal to the mind of the observer. Its mode of operation should present a puzzle to the observer, but not a puzzle incapable of solution by the mass of people, nor a puzzle readily solved by the mass of people. A puzzle which is readily solved holds little attraction, and hence holds an observer's attention for only a short time. What is more important, however, the solution of such a puzzle offers no sense of achievement to an observer. Thus, a display sign which presents a simple puzzle in its mode of operation does not require much time or mental effort on the part of the observer to solve the puzzle and leaves no lasting impression with him. The signs referred to in the aforementioned patents are of this general type. A sign which presents a puzzle in its mode of operation which is too difficult for solution by the mass of people in a relatively short time also is objectionable, because, while it may attract the attention of an observer for a longer time than if the puzzle were simple, the solution of the puzzle supersedes the effect of the sign in the mind of the observer, and this is not the only undesirable effect. The observer, because he could not solve the puzzle is, from a psychological point of view, depressed and disgruntled by his defeat. Therefore, even if the observer remembers what wares or services were being advertised, consciously or subconsciously he associates an unpleasant experience with the wares or services. Therefore, where the puzzle is simple of solution, the tendency is for the observer to forget the display altogether. Where the puzzle is difficult to solve, if the observer recalls the wares or services, he associates an unpleasantness therewith. Both results are in direct opposition to the results desired, i.e. a recollection of the wares or services at a later date coupled with a favourable disposition toward them. These favourable results are achieved by presenting to the observer a puzzle which is intermediate in difficulty of solution to the puzzles already mentioned, and it has been found that these results are achieved with an animated display sign embodying my invention, because such a sign was designed bearing in mind the psychological effects desired, and yet it was also designed to achieve enhanced animation effects. The effect of a display sign which presents a puzzle of intermediate difficulty to an observer is two-fold: (*a*) to draw his attention for a longer period than if the puzzle had been simple, thus permitting the wares or services advertised to become more impressed on the mind of the observer, and (*b*) because the observer will be pleased with having solved the puzzle in a relatively short time, to associate with the wares or services a pleasant experience. Thus, in accordance with my invention, I have provided an animated

display sign which produces more effective animation than has hitherto been possible, and at the same time which is designed to meet the psychological requirements of not only preventing the observer from becoming bored, apathetic or disgruntled, but also actually presenting the advertised wares or services in such a manner that they are impressed on the observer and associated with a pleasant experience.

In brief, an animated display sign embodying my invention comprises a holder and a display sign removably supported in the holder. The sign has coloured indicia thereon coloured in two contrasting colours which are deficient in the distinguishing hues of each other. At least one set of coloured light casting devices comprising at least two lights are provided. One of the light casting devices includes one of the lights and is adapted to cast light corresponding at least substantially to one of the colours on a surface of the sign. The other of the light casting devices includes the other of the lights and is adapted to cast light corresponding at least substantially to the other of the colours on the surface of the sign. A switching device is connected in circuit with the lights. The switching device is adapted to switch the lights on and off in the following repeated sequence of steps:

(*a*) The one light flashing alternately with the other light a predetermined number of times;

(*b*) The other light on and the one light out;

(*c*) All of the lights on;

(*d*) The one light on and the other light off; and

(*e*) The other light on and the one light out.

The time intervals between flashes of the one light and the other light and between flashes of the other light and the one light in step (*a*) are at least substantially equal, are sufficient to convey the impression of animation of the sign to an observer, and are substantially less than each duration of illumination of the lights in steps (*b*), (*c*), (*d*) and (*e*). The durations of illumination of the one light and the other light in step (*a*) are at least substantially equal, are sufficient to convey the impression of animation of the sign to an observer, and are substantially less than each duration of illumination of the lights in steps (*b*), (*c*), (*d*) and (*e*).

Apparatus embodying my invention will become more apparent from the following detailed description taken in conjunction with the drawings, in which:

FIGURE 1 is a perspective view of one embodiment of my invention,

FIGURE 2 shows a display sign card which may be used with the embodiment of my invention shown in FIGURE 1,

FIGURE 3 is an alternative embodiment of my invention,

FIGURE 4 is a wiring diagram of the electrical apparatus used with an animated display sign embodying my invention,

FIGURE 5 illustrates switching apparatus useful in practising my invention, and

FIGURE 6 is a front elevation of the cam shown in FIGURE 5.

Referring to FIGURE 2, I have shown a display sign card **10** made of cardboard or other opaque material and having a display or viewing surface **11** on which are printed indicia **12** in the form of arrows. Alternate indicia **12***a* and **12***b* are coloured in two contrasting colours which are deficient in the distinguishing hues of each other. Preferably indicia **12***a* are red and indicia **12***b* are green, as these have been found to be the most suitable colours. However, other pairs of contrasting and preferably mutually exclusive and complementary colours could be used. In addition, to achieve a different type of animated effect, a third colour could be employed. For example, arrows **12** could alternate in the repeated sequence of red, blue, red, green. The background **13** and **14** of display sign card **10** is coloured in positive and negative colours respectively. As used herein, a negative colour is one that will not respond to either of the hues of light cast on the display sign during normal operation thereof. A negative colour frequently employed is black. A positive colour, on the other hand is one which responds at least substantially equally to each hue of light cast upon the sign. What constitutes a positive colour is, as in the case of a negative colour, dependent upon the colours of the indicia and the colours of light cast upon the sign. Where the indicia are red and green, white is a satisfactory positive colour.

It will be understood that the term indicia as used herein is intended to cover markings on the sign in such geometrical forms as circles, triangles, rectangles, rings, squares, etc. and also covers letters, numerals and markings taking the form of elements of a non-geometrical pictorial or design representation.

As aforementioned, background **14** is coloured in black, and with the particular display sign card illustrated, it is intended that the merchandiser should write his weekly special in chalk over background **14**. Preferably red and/or green chalk should be employed.

As best shown in FIGURE 1, apparatus embodying my invention comprises a housing **15** which has as a part thereof a holder **16** in which display card **10** is removably supported. Positioned below holder **16** is a cover plate **17** under which is the apparatus shown in FIGURE 5. Extending outwardly from and mounted on cover plate **17** are light casting devices **18** and **19**. Light casting devices **18** comprise light bulbs **20** and **21** and semicylindrical, red, transparent plastic masks **22**. Light casting devices **19** comprise light bulbs **23** and **24** and semicylindrical green, transparent masks **25**. Thus light casting devices **18** and **19** each are adapted to cast on sign card **10** a colour corresponding to a colour of the indicia on the sign. It will be appreciated that instead of employing masks **22** and **25**, coloured lights could be used. Housing **15** has a hood portion **26** which prevents light from the light casting devices from being observed directly by the person looking at the sign card.

The embodiment of my invention shown in FIGURE 3 is similar to that shown in FIGURE 1 and employs the same light casting devices and the same switching apparatus (FIGURE 5). The differences are that at least the indicia of sign **10** are transparent, and the light casting devices are placed on the side of the sign remote from the viewing surface **11**, whereas in FIGURE 1 the light casting devices are placed on the viewing side of the sign.

Referring now to FIGURE 4, I have shown an electric motor **27**, light bulbs **20**, **21**, **23** and **24** and microswitches **28** and **29**. Microswitch **28** has contacts **30** and **31**, and microswitch **29** has contacts **32**, **33** and **34**. Contacts **30** and **32** and one terminal **35** of motor **27** are connected by a wire **36** to a suitable supply of electrical energy (not shown). The other terminal **37** of motor **27** and one terminal **20***a*, **21***a*, **23***a* and **24***a* of lamp bulbs **20**, **21**, **23** and **24** respectively are connected by a wire **38** to the other side of the electrical energy supply. Terminals **20***b* and **21***b* of lamp bulbs **20** and **21** respectively are connected together by a wire **39** and are connected by another wire **40** to contacts **31** and **33**. Terminals **23***b* and **24***b* of lamp bulbs **23** and **24** respectively are connected together by a wire **41** and are connected by another wire **42** to contact **34**.

Referring now to FIGURE 5, I have shown a support strap **43** secured by suitable means to the underside of cover plate **17**. Motor **27** is secured to support strap **43**, and the shaft of the motor is connected to and drives a cam **44**. Secured to support strap **43** are microswitches **28** and **29** which have switch actuating arms **28***a* and **29***a* respectively which ride on the undersde and the cam edge respectively of cam **44**.

The cam edge of cam **44**, as best shown in FIG. 6, comprises a plurality of notches **45** separated by raised por-

tions 46, this section being followed by a smoothly curved section 47, a generally straight section 48 and another smoothly curved section 49. On the underside of cam 44 there is a raised cam surface 50 which extends for part of the length of section 49 and the section made up of notches 45 and raised portions 46. Switch actuating arm 28*a* bears against the underside of cam 44 and is positioned in the path of cam surface 50, so that the arm engages the cam surface.

In accordance with my invention, and in order to obtain the desirable results aforementioned, I operate my light casting devices in the following repeated sequence of steps:

(*a*) Lights 20 and 21 together flashing alternately with lights 23 and 24 together a predetermined number of times (the number of times is determined by the number of notches 45 and raised portions 46),

(*b*) Lights 23 and 24 on, lights 20 and 21 out,

(*c*) All of the lights on,

(*d*) Lights 20 and 21 on, lights 23 and 24 out, and

(*e*) Lights 23 and 24 on, lights 20 and 21 out.

The time intervals between flashes of lights 20 and 21 together and flashes of lights 23 and 24 together, and between flashes of the latter and flashes of the former are (1) at least substantially equal, (2) sufficient to convey the impression of animation of the sign to the eyes of an observer, and (3) substantially less than the duration of each of steps (*b*), (*c*), (*d*) and (*e*). These time intervals are well known. The durations of illumination of lights 20 and 21 and of lights 23 and 24 in step (*a*) are (1) at least substantially equal, (2) sufficient to convey the impression of animation of the sign to the eyes of an observer, and (3) substantially less than the duration of each of steps (*b*), (*c*), (*d*) and (*e*). These durations of illumination are well known. Preferably the total time interval for step (*a*) should be about eight seconds.

The durations of steps (*b*), (*c*), (*d*) and (*e*) preferably all are at least substantially equal. I have found a duration of four seconds for each step to be preferable.

In the operation of apparatus embodying my invention a display sign card or transparency 10 is inserted in holder 16, and wires 36 and 38 are connected to a suitable source of electrical energy, thus energizing motor 27 and causing it to rotate. Steps (*a*), (*b*), (*d*) and (*e*) are controlled by microswitch 29 alone. Step (*c*) is controlled by microswitches 28 and 29 together. During all but step (*c*), when switch actuating arm 28*a* of microswitch 28 is depressed by cam surface 50, thereby closing contacts 30 and 31, these contacts are open. During steps (*a*), switch actuating arm 29*a* of microswitch 29 rides in notches 45 and over raised portions 46. When arm 29 is in a notch, contacts 32 and 33 are connected and lights 20 and 21 are energized, while lights 23 and 24 are out. When arm 29*a* rides over a raised portion 46, contacts 32 and 34 are connected and lights 23 and 23 are energized, while lights 20 and 21 are out. During step (*b*), which takes place over about one half of the length of section 47, contacts 32 and 34 are connected and lights 23 and 24 are on, while lights 20 and 21 are out. Step (*c*) takes place over the second half of section 47. During step (*c*) contacts 30 and 31 are closed as aforementioned, contacts 32 and 34 remain closed, and hence all lights are on. Step (*d*) occurs over the length of section 48, and during step (*d*) arm 29*a* causes contacts 32 and 33 to be closed (contacts 30 and 31 are open during this step), thereby energizing only lights 20 and 21. Step (*e*) occurs over the length of section 49 when contacts 32 and 34 are closed, and hence only lights 23 and 24 are energized. This sequence then is repeated.

It will be appreciated that while I have disclosed my invention as practised with apparatus employing four light bulbs, more or fewer light bulbs could be employed. For example, one of light bulbs 20 and 21 could be deleted. For a larger display more than one set of light bulbs could be used. Where the colours employed are red and green, it should be noted that it is preferable to place the red light casting device between green light casting devices.

While I have disclosed certain preferred embodiments of my invention, those skilled in the art will realize that changes and modifications may be made therein without departing from my invention as defined in the appended claim.

What I claim as my invention is:

An animated display sign comprising a holder, a display sign removably supported by said holder, said sign having coloured indicia thereon coloured in two colours which are deficient in the distinguishing hues of each other, first and second coloured light casting devices including first and second light sources respectively, said first light casting device being adapted to cast light corresponding substantially to one of said colours on a surface of said sign, said second light casting device being adapted to cast light corresponding substantially to the other of said colours on said surface of said sign, and a switching device connected in circuit with said light sources, said switching device being adapted to switch said light sources on and off in the following repeated sequence of steps:

(*a*) said first light source flashing alternately with said second light source a predetermined number of times,

(*b*) said second light source on and said first light source out,

(*c*) both said first and said second light sources on,

(*d*) said first light source on and said second light source out,

(*e*) said second light source on and said first light source out,

the time intervals between flashes of said first light source and flashes of said second light source and between flashes of said second light source and flashes of said first light source in step (*a*) being susbtantially equal, being sufficient to convey the impression of animation of the sign to an observer, and being substantially less than the duration of each of steps (*b*), (*c*), (*d*) and (*e*), the durations of illumination of said first light source and said second light source in step (*a*) being substantially equal, being sufficient to convey the impression of animation of the sign to an observer and being substantially less than the duration of each of steps (*b*), (*c*), (*d*) and (*e*), the durations of steps (*b*), (*c*), (*d*) and (*e*) all being substantially equal, and the duration of step (*a*) being about twice the duration of any one of steps (*b*), (*c*), (*d*) or (*e*), said switching device comprising a cam, means for rotating said cam, two microswitches, said cam having a cam surface and a cam edge, one of said microswitches being operated by said cam surface, the other of said microswitches being operated by said cam edge, and first electrically conductive means connecting one terminal of each of said light sources and adapted to be connected to one side of a source of electrical energy, said other microswitch having two contacts, one of said contacts being adapted to be connected to the other side of said source of electrical energy, the other of said contacts being electrically connected to the another terminal of said first light source, said one microswitch having first, second and third contacts, said first and second contacts being electrically connected in one position of said one microswitch, said first and third contacts being electrically connected in another position of said one microswitch, said first contact being adapted to be connected to said other side of said source of electrical energy, said second contact being electrically connected to said other contact, said third contact being electrically connected to another terminal of said second light source, said cam edge comprising a plurality of notches followed by a first smoothly curved portion, a generally straight portion and

a second smoothly curved portion, said cam surface extending for part of the length of each of said second smoothly curved portion and said plurality of notches, in a rotation of said cam the contacts of said other microswitch being closed only during engagement of said other microswitch with said cam surface, said first and second contacts being closed only during engagement of said one microswitch with said straight portion and with said notches, said first and third contacts being closed only during engagement of said one microswitch with said smoothly curved portions and the raised portions between said notches, said colours being red and green.

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