March 19, 1946. B. P. RUCKER 2,396,971

TRAFFIC SIGNAL

Filed April 26, 1944 2 Sheets-Sheet 1

Fig. 1

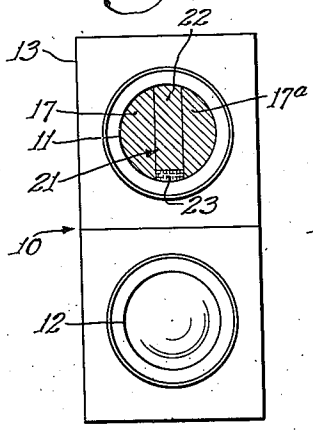


Fig. 2

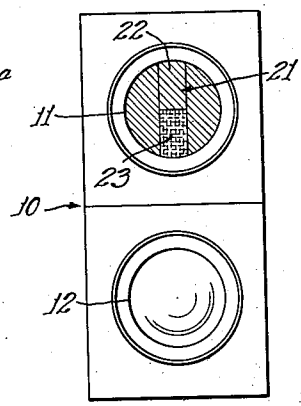


Fig. 3

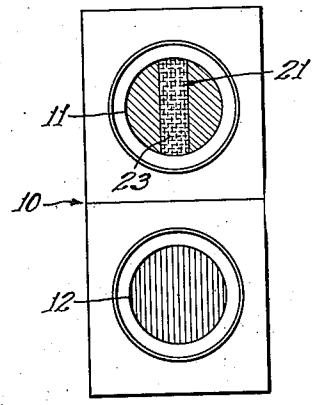
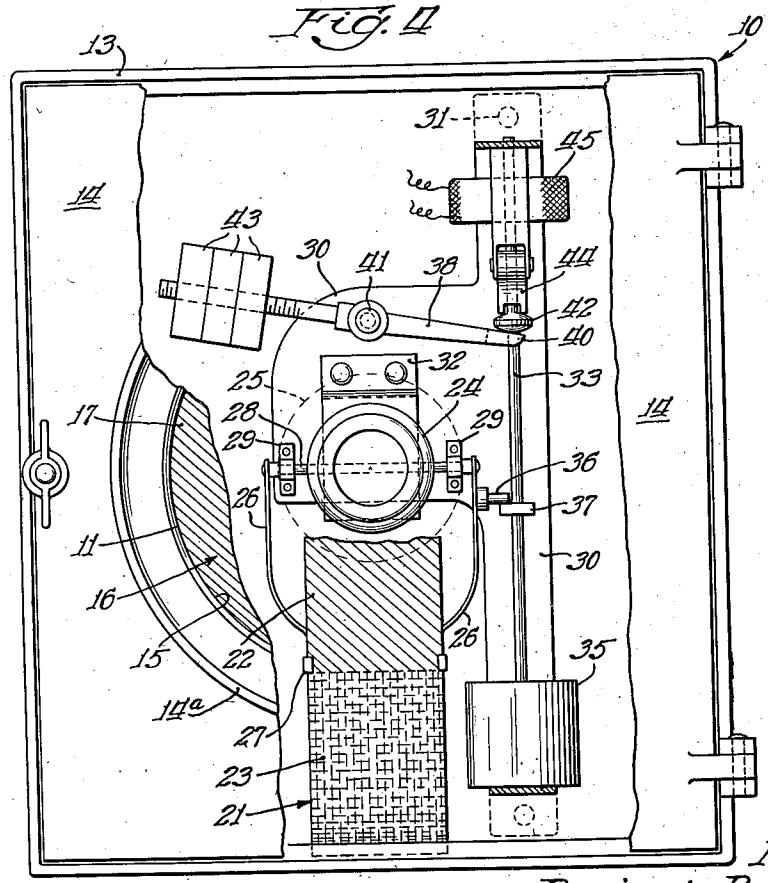


Fig. 4



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Filed April 26, 1944 2 Sheets-Sheet 2

Fig. 5

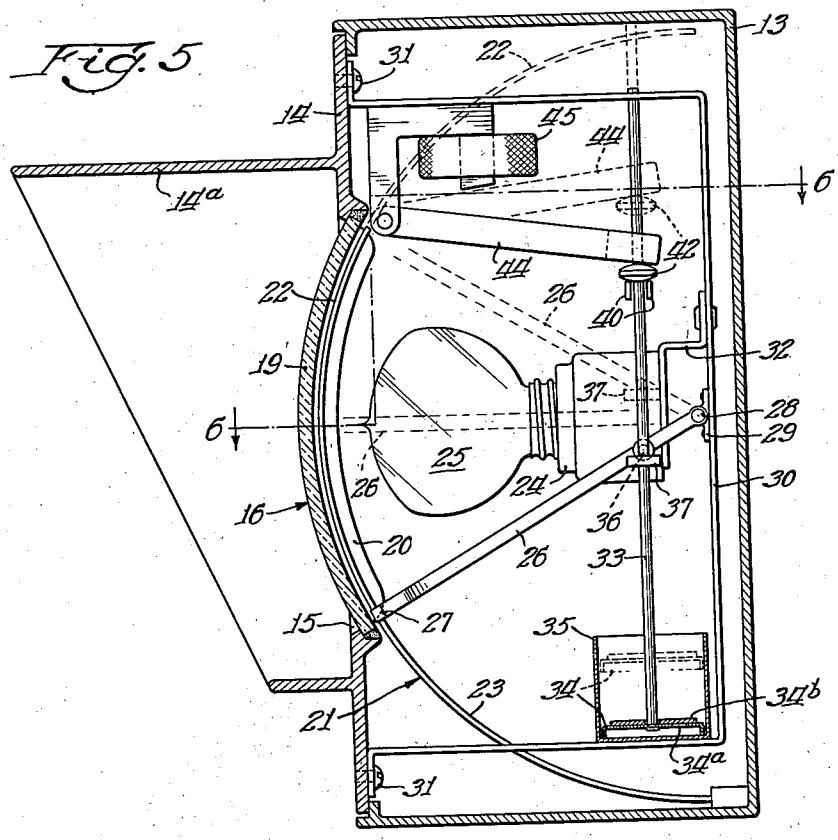


Fig. 6

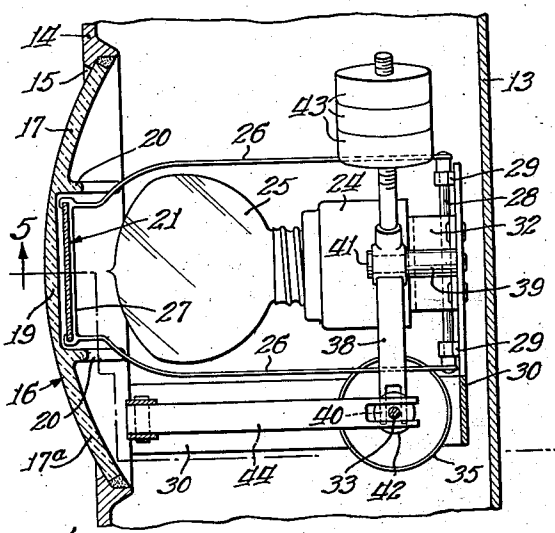
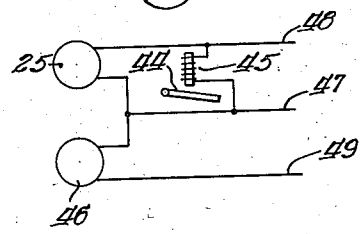


Fig. 7



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TRAFFIC SIGNAL

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Application April 26, 1944, Serial No. 532,853

4 Claims. (Cl. 177—327)

This invention relates to a traffic signal and one of its objects is to apprise the public in advance when the signal changes will occur.

In accordance with the present day conventional traffic signal, green, yellow and red lights are employed to indicate when the traffic shall proceed, proceed with caution or stop. It is very difficult for a person to judge how soon the yellow caution light will show when the green one is "on" and careful persons hesitate to cross an intersection when they approach it with the green light "on" unless they know that it has been "on" only a few seconds.

In accordance with the present invention, an indicator, operating in conjunction with the green light, moves relative thereto during the intervals of illumination thereof, thereby indicating how much time has elapsed since it became illuminated, whereby the public may ascertain how much longer the green light will be "on"; in other words, how soon the traffic signal will change from green to red.

In its simplest form the invention contemplates the use of a green lens having a clear section therein behind which is a translucent strip having a green section, which completes to all intents and purposes a green lens, this strip having also a yellow section, which when the strip is moved along the clear section of the lens during a given interval of time (approximately thirty seconds), indicates to the public, by the amount of yellow showing between the green sections of the lens, what portion of the thirty seconds have elapsed, thus enabling the public to judge whether it is safe to cross the intersection controlled by the traffic signal.

While I have referred to green, yellow and red lights, it is to be understood that these are only suggestive as any other combination of colored lights may be used.

Another object of the present invention is to provide simple means for moving a bi-colored strip along the clear section of the lens during a predetermined interval of time.

Another object is the provision of a concavo-convex lens having two spaced colored segments connected by a clear section, in combination with a bi-colored translucent strip, having one section of a color corresponding with that of the lens segments and a section of a contrasting color, together with means for moving the bi-colored strip along the clear section of the lens.

Other objects and advantages will appear in the course of this specification and with all of said objects and advantages in view, this invention consists in a traffic signal having a colored lens and a translucent strip of a color contrasting with that of the lens and movable along the lens and having means for moving it.

The invention further consists in a traffic signal having a lens composed of two spaced colored segments connected by a clear section and a translucent bi-colored strip movable along the clear section of the lens and having means for moving it.

The invention further consists in a traffic signal having a lens, a source of light and means for progressively changing the color of a portion of the lens.

The invention further consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the drawings accompanying this specification in which:

Fig. 1 is a front elevation of a traffic signal embodying one form of the present invention and showing the bi-colored strip in a position occupied at the commencement of its movement along the lens;

Fig. 2 is a similar view showing the bi-colored strip advanced further along the lens;

Fig. 3 is a view similar to Figs. 1 and 2, but showing the bi-colored strip advanced completely across the lens and the red light turned on;

Fig. 4 is a front elevation of the traffic signal with a portion of the door thereof broken out to show parts that would be otherwise hidden from view;

Fig. 5 is a view partly in side elevation and partly in vertical cross section taken approximately on the line 5—5 of Fig. 6, showing the moving parts at the limit of their upstroke in dotted lines;

Fig. 6 is a horizontal section taken approximately on the line 6—6 of Fig. 5 with the strip actuating lever occupying a horizontal position, and with portions of the housing or box, broken away; and

Fig. 7 is a diagrammatic view of the electric circuit employed in the signal.

Referring to said drawings, the reference character 10 designates a traffic signal, embodying one form of the present invention, mounted upon a suitable post, or other support (not shown), which signal is divided into upper and lower signal units, one for the green signal 11 and one for the red signal 12. As a preference, two separate housings may be used, one for each signal unit.

As illustrated, the green, or "go ahead," signal

unit is contained in a box 13 having an open front closed by a door 14 hinged thereto at one side and fastened by a latch or lock. Centrally disposed in said door is an opening 15 in which is cemented, or otherwise secured, a lens 16 desirably of concavo-convex form and surrounded by a hood 14a. As shown, this lens has two complemental segments 17, 17a, desirably of green color, spaced apart and connected by a clear glass parallel sided section 19. For clearly dividing the lines of division between the green segments and the clear section, the lens is formed with rearwardly extending ribs 20 at the dividing lines. The lens may be constructed in any suitable manner and the segments 17, 17a may be composed of green glass formed separately from the clear section and fused thereto.

Cooperating with the lens is a translucent bi-colored strip 21 of approximately the same width as the clear section of the lens, and said strip is disposed immediately behind said clear section and is movable lengthwise thereof.

One section 22 of the translucent strip 21 is of the same color as that of the segments of the lens, green in the instant case, and when this section is disposed behind the clear section of the lens, it presents to all intents and purposes a disc-like lens of one color. The other section 23 of the strip is of a contrasting color, such as yellow, with a sharp line of division between the two colors. It will be obvious that when the yellow section 23 is being moved into view behind the clear section of the lens, the green section 22 recedes; and as the strip continues to advance, the line of division between the two colors moves along the clear section of the lens from one end thereof to the other; for example, from the bottom to the top thereof.

The length of time for the travel of the yellow section of the bi-colored strip along the lens may be determined by the traffic rules and regulations, and is usually approximately thirty seconds.

Mounted behind the lens in a lamp socket 24 is an electric lamp 25 which illuminates the lens and bi-colored strip when the electric current is turned on, thereby making the entire green light visible; and it also makes the yellow section, seen through the lens, clearly visible as it travels along the same.

The bi-colored strip 21 is here shown as of arcuate form, and of an extent approximately twice that of the length of the clear section of the lens. The strip may be composed of plastic or other translucent material. Any suitable mechanism may be employed for oscillating the strip through its arc of rotation, and the one shown has been chosen merely for the purpose of illustration.

As shown, the bi-colored strip is carried by a pair of levers 26 connected to the strip as by a cross bar 27 hooked over the side edges of the strip; and said levers are welded or otherwise rigidly secured to a shaft 28 pivotally mounted in brackets 29 that are fastened to a supporting member 30 which is secured to the door 14 as by screws 31 and carries the entire operating mechanism. The lamp socket 24 is supported from said supporting member 30 by a bracket 32 secured thereto in any suitable manner.

Disposed at one side of one of the levers 26 is a vertically extending reciprocatory rod 33, the upper end of which is guided in a horizontal part of the supporting member 30, its lower end being shown as secured to a piston 34 contained in a dash pot 35 mounted on the lower horizontal part of the supporting member 30, the purpose of which dash pot will be presently explained. The piston has a vent aperture 34a therein, controlled by a disc valve 34b which rests on the piston.

One lever 26 is operatively connected with the rod 33 so as to be actuated thereby and, as shown, said lever has a pin 36 projecting therefrom which overlies a button or other shoulder 37 fast on the rod. Upward movement of the rod causes the levers 26, and therewith the bi-colored strip, to be swung in an upward direction. The upstroke of the rod 33 is through a distance which swings the entire yellow half of the bi-colored strip into register with the lens.

This rod may be reciprocated by any suitable mechanism and, as here shown, a counterweighted lever 38 is provided for this purpose which is fulcrumed, as at 41, upon a block 39 mounted upon the supporting member 30. The counterweighted lever has a fork 40 on one arm that underlies a button or other shoulder 42 that is fast on the rod 33. The other arm of the counterweighted lever has one or more weighted bodies 43 adjustably mounted thereon as, for instance, by a screw threaded connection therewith; the counterweighted lever functions to lift the rod 33 and therewith swing up the levers 26 and the bi-colored strip whenever the rod is released from its down position. The rod is held in its down position by an armature 44 of an electro-magnet 45 mounted on the horizontal part of the supporting member 30. When the electro-magnet is deenergized, the free end of the armature rests upon the button 42 and counteracts against the counterweighted lever 38; and when the electro-magnet is energized, it attracts the armature, thereby releasing the rod, whereupon the counterweighted lever raises the rod.

The upstroke of the rod is retarded by the dash pot 35 and piston 34; and by adjusting the counterweights 43 and/or by regulating the capacity of the dash pot, the time limit for swinging up the bi-colored strip through its arc of rotation can be regulated to conform to the traffic rules and regulations. The time interval depends upon many factors; among which are the amount of traffic at any given intersection, and the width of the intersection. Thirty seconds may be taken as an average time limit for a signal change.

Conventional control means may be used to control the circuits for the electric lamps and electro-magnet, but as the circuit controlling means forms no part of this invention, it is not described nor illustrated. The electric lamp for the red light signal unit is seen at 46 in Fig. 7, where the conductors for the two lamps are shown at 47, 48 and 49. The electro-magnet is arranged in parallel with the lamp 25. As will be understood, the electric current is turned on alternately to the two lamps 25, 46, and when the current is turned on for the lamp 25 the electro-magnet is simultaneously energized so that the bi-colored strip begins to move upward as soon as the lens 16 and bi-colored strip 21 are illuminated.

In the operation of the traffic signal with the parts at rest, as seen in solid lines in Fig. 5, and the current turned on for the lamp 46 of the red light signal unit, then when the current to said lamp 46 is turned off and the current to the lamp 25 and electro-magnet is turned on, the lens 16 and bi-colored strip 21 are illuminated and the

electro-magnet becomes energized, thereby attracting the armature and releasing the rod **33** from its down position. The counterweighted lever **38** then begins to raise said rod against the retarding action of the dash pot, and the rod, through its connection with the lever **26**, swings the latter upward, and therewith swings the bi-colored strip upward, along the clear area of the lens.

When the current is first turned on to the lamp **25**, the green section of the bi-colored strip is disposed behind the clear section of the lens and the whole lens shown as a green disc. As the rod continues to rise, the upper edge of the yellow section of the strip becomes visible and the green section begins to recede from the clear space of the lens (see Fig. 1). During the upward swing of the bi-colored strip, the yellow section thereof moves upwardly displacing the green section (see Fig. 2) until it finally completely displaces it (see Fig. 3) so that the yellow color alone appears between the two green segments of the lens. At this instant, the circuit controlling means breaks the circuit for the lamp **25** and the electro-magnet. When the electro-magnet is deenergized the armature falls by gravity, overbalancing the counterweighted lever and the rod **33** drops, permitting the levers **26** and bi-colored strip **21** to swing down to the limit of their down movement, thereby again presenting the green section of the bi-colored strip to the clear section of the lens.

Because of the valve controlled vent aperture in the piston, the down stroke of the rod **33** and parts moved thereby will be more rapid than their upstrokes.

From the above it will be apparent that I have provided a traffic signal by which the public will be apprised by glancing at the green light approximately how much time is left before the green light will be extinguished and the red light turned on. A person can determine very easily by the amount of yellow showing between the green segments of the lens approximately how much time has elapsed since the green light came "on," and how much longer it will remain in the "on" position.

One advantage of the instant traffic signal is that it makes street crossing safer, as the public can tell at a glance the time which will elapse before the "stop" signal comes on. Two signal units will suffice, instead of three, as at present. This represents a saving in materials, wiring, controller costs, and so forth.

Instead of using a lens having two colored segments separated by a clear area, a complete colored lens may be used and an opaque arcuate strip of half the extent of the bi-colored strip may be used, which in one position is above or below the lens, permitting the rays of light from the lamp to show through the entire lens, but which strip may be moved along the lens, thereby progressively cutting off the rays of light which are intercepted by the strip, and thereby indicating how much time has elapsed since the green light was turned "on" and how much time is left before the red light will show.

Having thus described my invention, it is obvious that various modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, arrangement, and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a traffic signal, a housing having a lens opening in a wall thereof, a lens mounted in said opening and having two spaced segments of similar selected color and a clear area between said segments, a translucent bi-colored strip disposed behind said clear area and having one section of the same color as the color of the lens segments and a contiguous section of a contrasting color, said strip being movable along the clear area, whereby to cause the first mentioned section of the strip to recede from said area and the section containing the contrasting color to appear in the clear area, actuating means for said bi-colored strip and means to illuminate the lens and strip.

2. In a traffic signal, a housing having a lens opening in a wall thereof, a lens of selected color mounted in said opening, a movable translucent bi-colored strip of less width than the diameter of the lens and having one section of the same color as the lens and having a contiguous section of a contrasting color, means to move said strip along said lens from a first position in which the section of the strip having the same color as the lens registers with the lens, to a second position in which the section which contains the contrasting color registers with the lens, actuating means for said bi-colored strip and means to illuminate the lens and translucent member.

3. In a traffic signal, a housing having a lens opening in a wall thereof, a stationary translucent lens member mounted in said opening and a movable translucent strip of less width than the diameter of the lens member operatively related to said stationary translucent lens member and movable relative thereto, said stationary translucent lens member having a selected color and the movable translucent strip having a section of contrasting color, progressively movable along the stationary translucent member, actuating means for said movable translucent strip and means to illuminate the lens.

4. In a traffic signal, a housing having a lens opening in the wall thereof, a lens having two spaced segments, mounted in said opening, both segments having similar selected colors and a clear area between said segments, a translucent bi-colored arcuate strip disposed behind said clear area and having one section of the same color as the color of the segments of the lens and a contiguous section of a contrasting color, lever means secured to and carrying said strip, a reciprocatory rod operatively connected to said lever means, means for moving said rod in one direction, retarding means for said rod, an electro-magnet having an armature for depressing said rod and an electric lamp in parallel with said electro-magnet for illuminating said lens and bi-colored strip.

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