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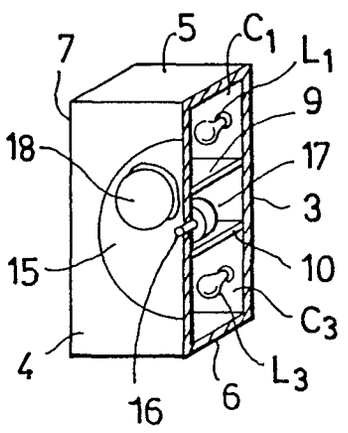
(54) Rotatable signal for directing traffic.

(57) A traffic signal is described comprising a housing having a source of green light in a first section, a source of red light in a second section, and a source of yellow light in a third section. The traffic signal further includes a cover plate closing one end of the housing, a drive for cyclically rotating the cover plate, and a light-transmitting window carried by the cover plate on one side of its rotary axis such that, during each rotary cycle of the cover plate, its window traverses the respective sections of the housing so as to transmit green light for a first portion of the cycle, yellow light for another portion, and red light for a further portion.



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ROTATABLE SIGNAL FOR DIRECTING TRAFFIC

The present invention relates to traffic signals, such as are provided at the intersections and other locations of public roads and highways for controlling the traffic therethrough.

The traffic signals in present use include a green light which is energized to direct the traffic to "go," and a red light which is energized to direct the traffic to "stop." They frequently also include a "caution" yellow light energized at the end of the energization period of the green light to alert the traffic of the impending change of the light from green to red; and some traffic signals also energize the "caution" yellow light at the end of the energization period of the red light to alert the traffic of the impending change from red to green.

One of the big disadvantages of traffic signals of this type is the fact that, except for the brief "caution" yellow light period, there is no indication to the traffic how much time is left before the end of the "green" light period or of the "red" light period. The lack of an indication of the end of the "green" light period can produce a dangerous situation, for example when the light abruptly changes from green to red just as the vehicle is about to enter the intersection, particularly when the vehicle is fast-moving as in an open highway. The driver of such a vehicle is not only placed in an uncomfortable position as he approaches the intersection because of his apprehension that the traffic signal may turn from green to red at a critical instant, but he is also placed in a dangerous situation since, if he continues through the intersection when the light changes from green to red there is a danger of colliding with a vehicle traversing the intersection from the cross-traffic, and if he brakes too quickly, there is

a danger of being collided by another vehicle directly behind him and not braking at that instant. Because of this danger, some traffic signals include an arrangement for "blinking" the green signal just before it is to change to yellow, but this merely alerts the driver of the impending change from green to red slightly before the energization of the yellow signal.

An object of the present invention is to provide a traffic signal having advantages in the above respects. More particularly, an object of the present invention is to provide a traffic signal which also continuously informs the drivers of the current point in the traffic signal cycle at any particular instant such that each driver is aware of the time left for the respective portion of the traffic signal then energized and can therefore control his vehicle accordingly well before he approaches the intersection.

According to a broad aspect of the present invention, there is provided a traffic signal comprising: a housing; a source of green light in a first section of the housing on one side of its horizontal axis; a source of red light in a second section of the housing on the opposite side of its horizontal axis; a cover plate closing one end of the housing; a drive for cyclically rotating the cover plate about the housing horizontal axis; and a light-transmitting window carried by the cover plate on one side of its rotary axis, such that for a first portion of each rotary cycle of the cover plate, the window traverses the first section of the housing to transmit green light therethrough, and for a second portion of each rotary cycle of the cover plate, the window traverses the second section of the housing to transmit red light therethrough.

In the preferred embodiments of the invention as described below, the housing further includes a source

of yellow light in a third section thereof, such that for a third portion of each rotary cycle of the cover plate, the window traverses the third section of the housing to transmit yellow light therethrough.

Such traffic signal provides continuous indications to the vehicle drivers of the point the traffic signal cycle is at any particular instant and also of the time remaining until the respective portion of the signal cycle terminates and the next portion starts, so that the driver can control his vehicle accordingly. Such a traffic signal thus not only avoids the dangerous situation which may be created by the presently used traffic signals as described above, but also relieves the vehicle drivers of the apprehension of a possible signal change at a critical point as they approach the traffic signal at the intersection. Other advantages of the traffic signal of the present invention are that they consume substantially less electricity, and can be constructed more compactly, than the conventional traffic signals.

Further features and advantages of the invention will be apparent from the description below.

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

Fig. 1 is a three-dimensional view illustrating one form of traffic signal constructed in accordance with the present invention;

Fig. 2 is a sectional view along lines II--II of Fig. 1;

Fig. 3 is a schematical sectional view along lines III--III of Fig. 1;

Fig. 4 is a diagram helpful in understanding the operation of the traffic signals of Figs. 1-3, and

Figs. 5, 6a, and 6b illustrate another traffic signal constructed in accordance with the present invention.

The traffic signal illustrated in Figs. 1-3 of the drawings comprises a housing 2 including a rear wall 3, front wall 4, top wall 5, bottom wall 6, and end walls 7, 8. The interior of housing 2 is provided with a first pair of parallel partitions 9, 10, and a second pair of parallel partitions 11, 12, extending perpendicularly to and between partitions 9, 10. Partitions 9-12 thus divide the interior of housing 2 into five sections or compartments, namely: two large compartments C_1, C_2 at the top and bottom of the housing, respectively; two smaller compartments C_3, C_4 on opposite sides of the housing and between the larger compartments C_1, C_2; and a central compartment C_5 bounded by the other four compartments.

Four colored lamps are disposed within the four compartments C_1-C_4, as follows: a red lamp L_1 in the top compartment C_1; a green lamp L_2 in the bottom compartment C_2; a yellow lamp L_2 in one side compartment C_3; and another yellow lamp L_4 in the other side compartment C_4. The central, fifth compartment C_5 does not include a lamp, but is used for another purpose as described below.

The front wall 4 of housing 2 is closed by a circular cover plate 15 which is mounted for rotation about the central horizontal axis 16 of the housing. Cover plate 15 is rotated by an electric motor 17 supported on partition 10 within the central compartment C_5 so as to be xoaxial with the central horizontal axis 16 of the housing.

Rotatable cover plate 15 is opaque but includes a transparent window 18 of circular configuration laterally of the central horizontal axis 16 of the

housing and its cover plate 15. Window 18 is so located that during each cycle of rotation of its cover plate 15, the window traverses the four sections or compartments of housing 2 in succession, thereby to transmit through the window the colored light of the respective housing compartment with which it is aligned during the respective portion of the rotational cycle of the cover plate. Motor 17 is driven to rotate cover plate 15, and thereby its window 18, in the clockwise direction so that window 18 traverses compartments C_1-C_4 in sequence and becomes aligned with each compartment to project the color of that compartment during a portion of each cycle.

The operation of the traffic signal illustrated in Figs. 1-3 of the drawings is schematically indicated in the diagram of Fig. 4. Thus, during each cycle of rotation of cover plate 15, its window 18 first traverses compartment C_1 to project therethrough the red light of its lamp L_4, then compartment C_2 to project the green light of its lamp L_2, and finally compartment C_3 to project the yellow light of its lamp L_3.

It will thus be seen that each cycle of rotation of cover plate 15 results in projecting through window 18 a red "stop" light and a green "go" light in separate phases of each cycle, with a yellow "caution" light being displayed in a smaller portion of the cycle just before each switch-over from red-to-green and green-to-red. It will also be seen that just before each switch-over, a part of window 18 will be of one color, that preceding the switch-over, and another part will be of the other color, subsequent to the switch-over.

Thus, by a quick-glance at the traffic signal, the viewer is immediately apprised of the exact point in

the cycle at which the traffic signal is at the instant, and therefore how much time is left before there will be a switch-over in the traffic signal. The vehicle driver therefore can control the vehicle accordingly, since he knows whether he has sufficient time to traverse the intersection, or whether he should start to slow-down the vehicle so as to come to a safe stop before arriving at the intersection.

The illustrated traffic signal thus avoids the possibly dangerous situation discussed above resulting from a sudden change in traffic signals at a critical point during the approach to the intersection. It also relieves the vehicle driver of the apprehension that such a sudden change may occur as he approaches the intersection.

Fig. 5 illustrates another traffic signal constructed in accordance with the present invention, which provides not only light signals for directing traffic, but also other signals, such as arrow signals (or word signals) for directing the traffic. Figs. 6a and 6b illustrate the operation of the traffic signal of Fig. 5.

Thus, as shown in Fig. 5, the traffic signal illustrated comprises a housing 102 whose interior includes a single lamp 104, e.g. a circular fluorescent lamp, and is closed by a screen 105 having three colored light-transmissive sections, namely an upper red section 106, an intermediate yellow section 107, and a lower green section 108, separated along straight parallel lines 109, 110. Just below the green section 108, housing 102 includes indicia, in the form of an arrow 112, which is covered by a blue light-transmissive screen.

As in the embodiment of the invention described in Figs. 1-4, the front wall of housing 102 is closed by a circular cover plate 115 mounted for

rotation about the central horizontal axis of the housing. Cover plate 115 is rotated by an electric motor 117 mounted centrally of the housing rear wall. Rotatable cover plate 115 is opaque but also includes a transparent window 118 of circular configuration and disposed laterally of the central horizontal axis of the housing, such that rotation of the cover plate by motor 117 causes window 118 to traverse the red housing section 106, yellow housing section 107, green housing section 108, and yellow housing section 107, in that sequence.

Cover plate 115 is further formed with an elongated slot 120 along its outer periphery alignable with indicia 112 during the appropriate portion of the cover plate rotary cycle. This is more particularly illustrated in Figs. 6a and 6b. Thus, as shown in Fig. 6a, indicia 112 is normally concaled by cover plate 115, but when the cover plate arrives at the appropriate portion of the cycle wherein a left turn is permitted, its slot 120 uncovers indicia 112 to signal to the traffic that a left turn is permitted.

It will be appreciated that other types of indicia may be used instead of the left-turn arrow 112. Thus, there may also be included a right-turn arrow, or word directions such as "walk," "stop," or "caution," for example, to aid persons suffering from color blindness.

Fig. 5 illustrates a further modification, in that it includes means for returning the cover plate to its home position when the electric motor 117 is de-energized. In this em bodiment, the returning means comprises a weight 122 secured to the motor drive for biasing the motor to a home position when the motor is de-energized. This home position would be selected to align window 118 of the cover plate 115 with a

predetermined color section of the housing, e.g., the red section or the yellow section, according to the particular application of the traffic signal. Thus, if it is desired to produce a continuous signal of one kind at a particular intersection, for example, a stop or a caution signal, it is only necessary to locate weight 122 with respect to the rotary position of the cover plage 115 so that the proper signal will be displayed when the motor is de-energized.

In some cases it may be desirable not to include the yellow "caution" section to avoid confusion that may be caused by an observer seeing partly yellow together with red or green. In such a case, the intermediate yellow section could be non-illuminated or blackened, to avoid the yellow being displayed at the same time as the green or red.

Many other variations may be made. Thus, where the intersection includes a traffic signal facing each of the four (or more) directions of traffic, one such signal may be provided for each direction. In addition, the traffic signal housing could be sectioned to project only the red "stop" light and the green "go" light, or only one of the two yellow "caution" lights. The traffic signal could also be embodied in a portable unit containing a battery supply for use in emergency situations.

Claims

1. A traffic signal, comprising: a housing; a source of green light in a first section of said housing on one side of its horizontal axis; a source of red light in a second section of said housing on the opposite side of its horizontal axis; a cover plate closing one end of the housing; a drive for cyclically rotating said cover plate about said housing horizontal axis; and a light-transmitting window carried by said cover plate on one side of its rotary axis, such that for a first portion of each rotary cycle of the cover plate, said window traverses said first section of the housing to transmit green light therethrough, and for a second portion of each rotary cycle of the cover plate, said window traverses said second section of the housing to transmit red light therethrough.

2. The traffic signal according to Claim 1, wherein said housing further includes a source of yellow light in a third section thereof, such that for a third portion of each rotary cycle of the cover plate, said window traverses said third section of the housing to transmit yellow light therethrough.

3. The traffic signal according to Claim 2, wherein said housing further includes a source of yellow light in a fourth section of said housing noncontiguous to said third housing section, such that during each rotary cycle of the cover plate, said window traverses said housing sections according to the following sequence: the first section to transmit green light, the third section to transmit yellow light, the second section to transmit red light, and the fourth section to transmit yellow light.

4. The traffic signal according to Claim 1, wherein said cover plate and said window are both of circular configuration, said window having a diameter less than one-third that of said cover plate.

5. The traffic signal according to Claim 1, wherein said drive is an electric motor mounted within said housing in alignment with its horizontal axis.

6. The traffic signal according to Claim 5, wherein said drive includes means returning said cover plate to a home position to align said window with a predetermined color section of the housing when said electric motor is de-energized.

7. The traffic signal according to Claim 6, wherein said latter means comprises a weight secured to said motor drive for biasing same to said home position.

8. The traffic signal according to Claim 1, wherein said housing further includes traffic control indicia, and said cover plate includes a further window normally concealing said traffic control indicia but exposing same at the proper time in the cycle of the cover plate according to the indicia to be displayed.

9. The traffic signal according to Claim 1, wherein said source of green light and said source of red light include separate green and red lamps in said first and second sections, respectively.

10. The traffic signal according to Claim 1, wherein said source of green light and said source of red light include a lamp common to said first and second sections, and a screen having a green filter in said first section, and a red filter in said second section.

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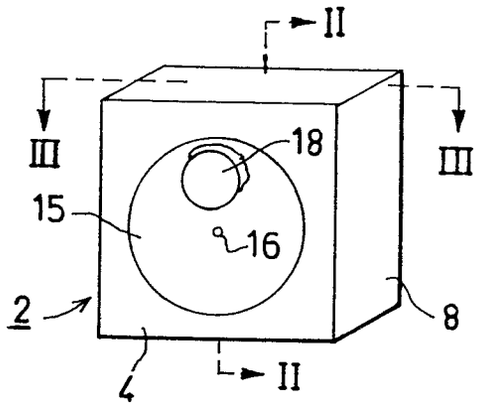

FIG. 1

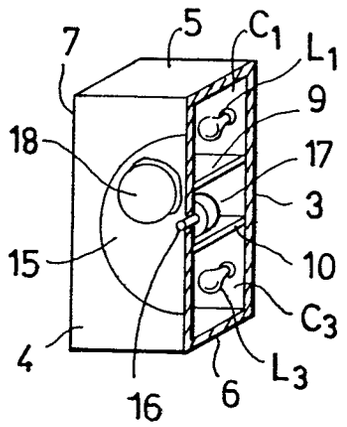

FIG 2

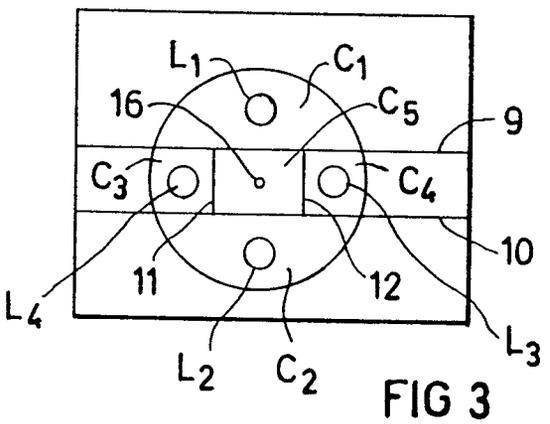

FIG 3

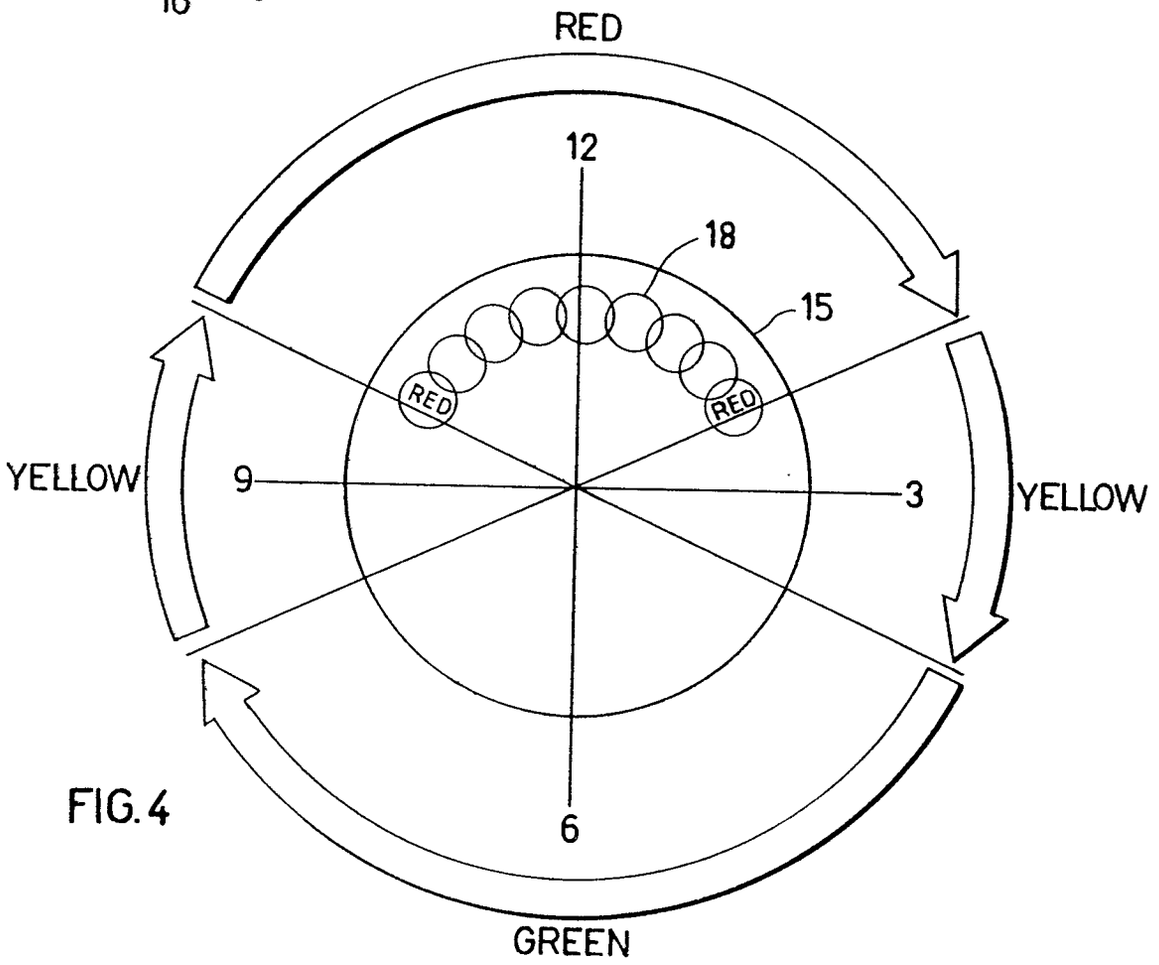

FIG. 4

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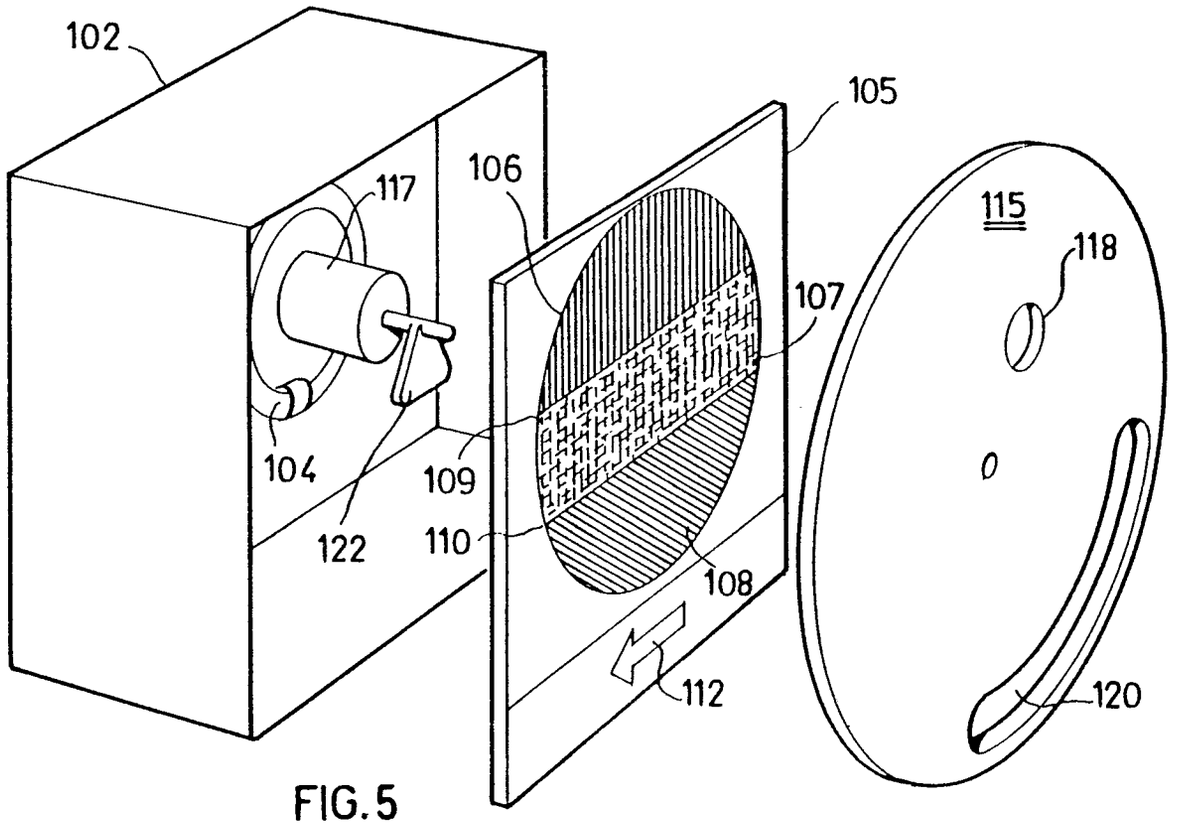

FIG.5

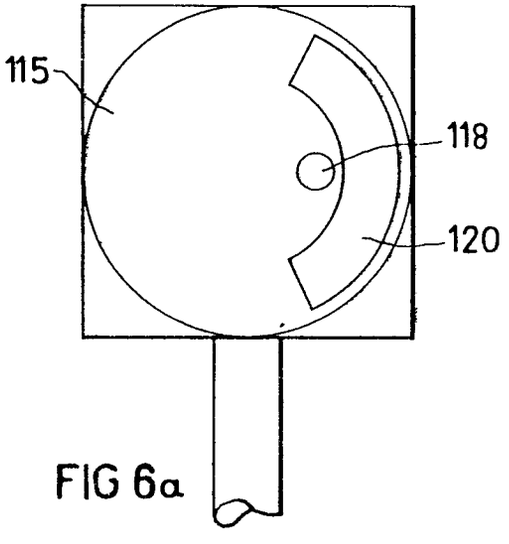

FIG 6a

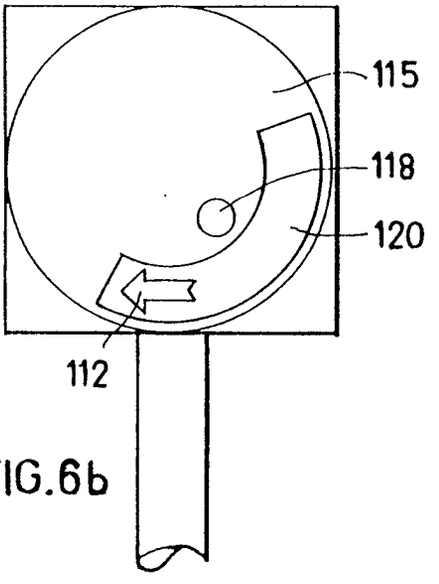

FIG.6b