Aug. 10, 1965 T. WAGNER 3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Filed Aug. 16, 1962

5 Sheets-Sheet 1

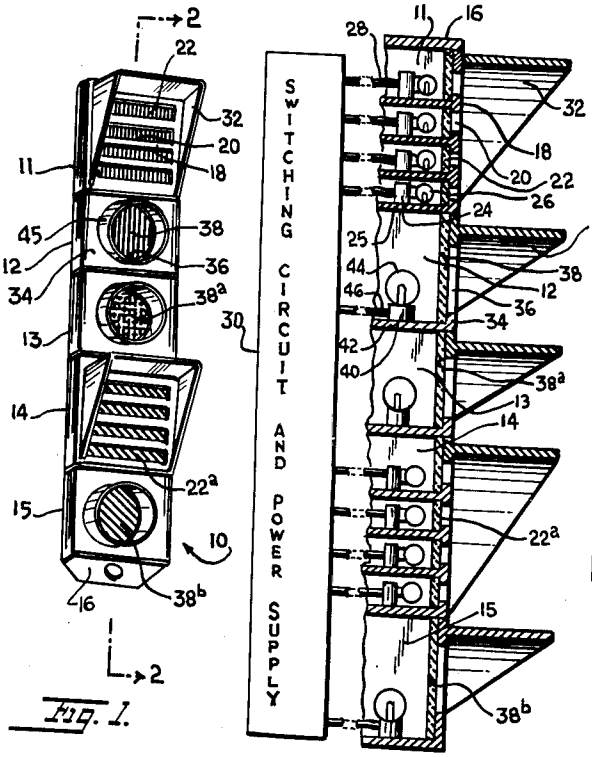

Fig. 1.

Fig. 2.

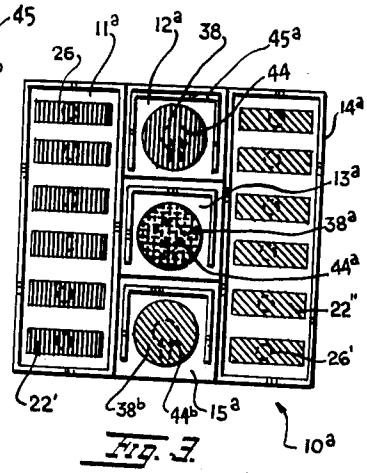

Fig. 3.

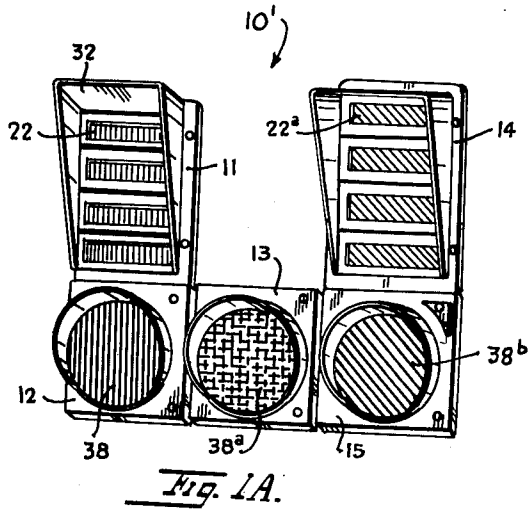

Fig. 1A.

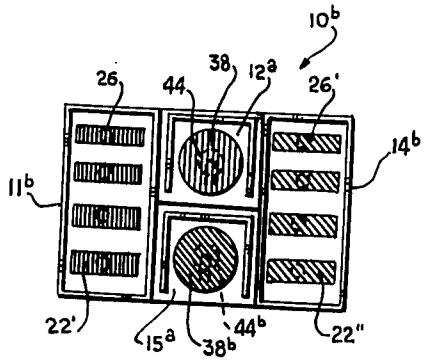

Fig. 4.

INVENTOR.
TOBIAS WAGNER
BY
ATTORNEY

Aug. 10, 1965 T. WAGNER 3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Filed Aug. 16, 1962

5 Sheets-Sheet 2

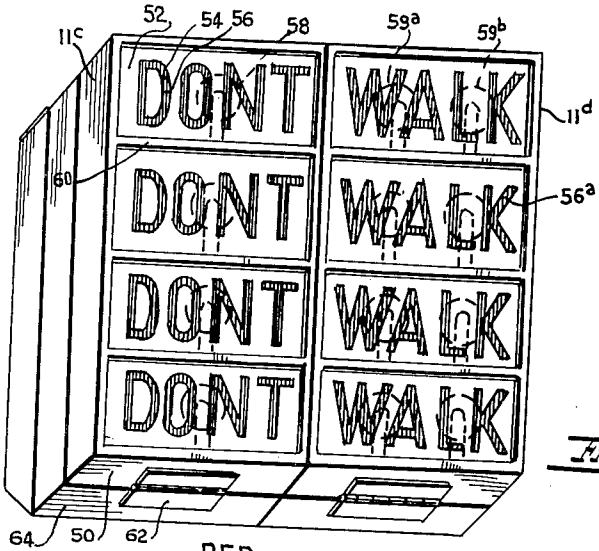

Fig. 5.

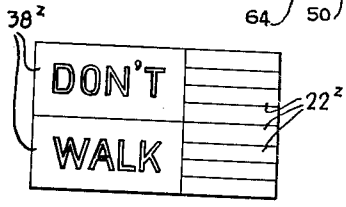

Fig. 18

Fig. 6.

INVENTOR.
TOBIAS WAGNER
BY
Zoltan Polachek
ATTORNEY

Aug. 10, 1965 T. WAGNER 3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Filed Aug. 16, 1962 5 Sheets-Sheet 3

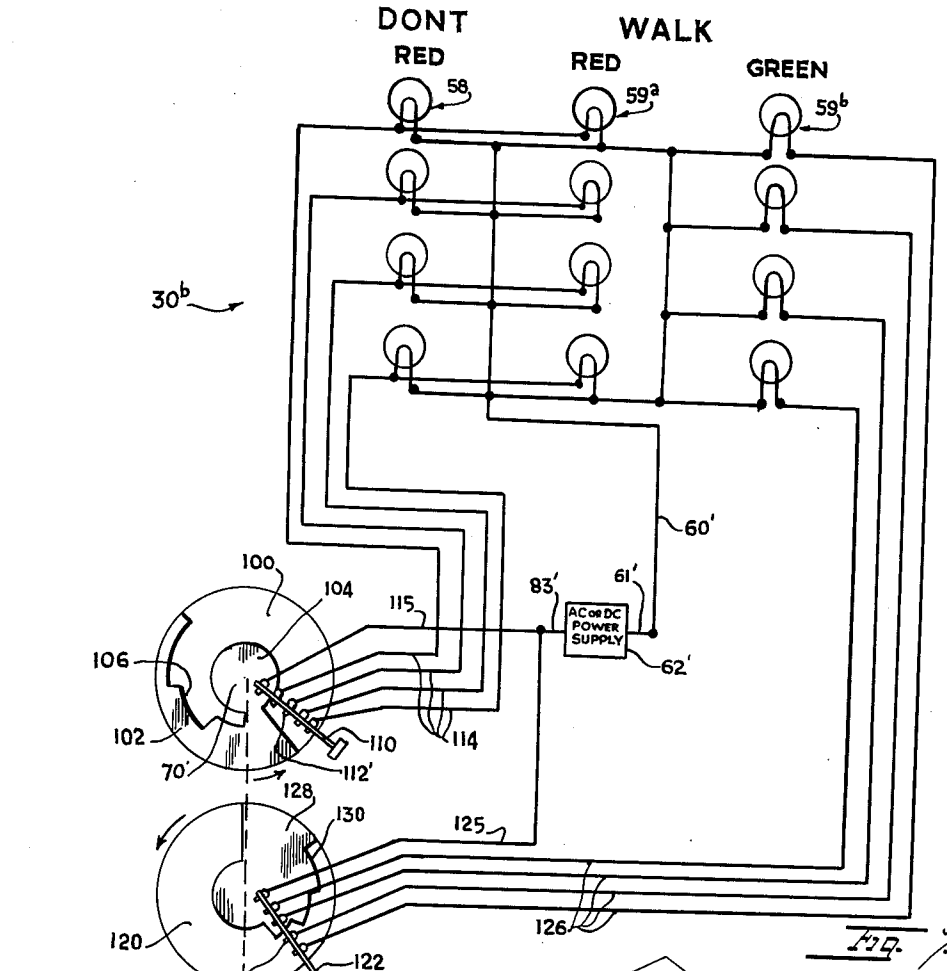

Fig. 7.

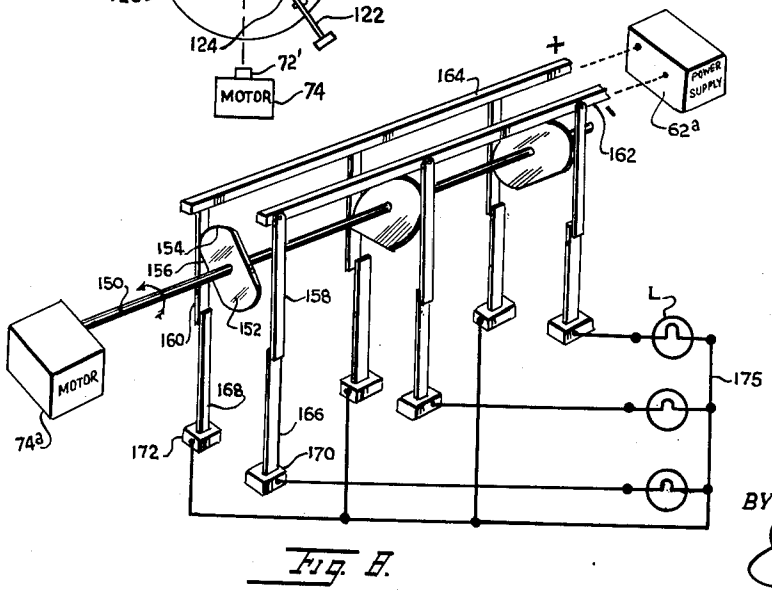

Fig. 8.

INVENTOR.
TOBIAS WAGNER
BY
ATTORNEY

Aug. 10, 1965

T. WAGNER

3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Filed Aug. 16, 1962

5 Sheets-Sheet 4

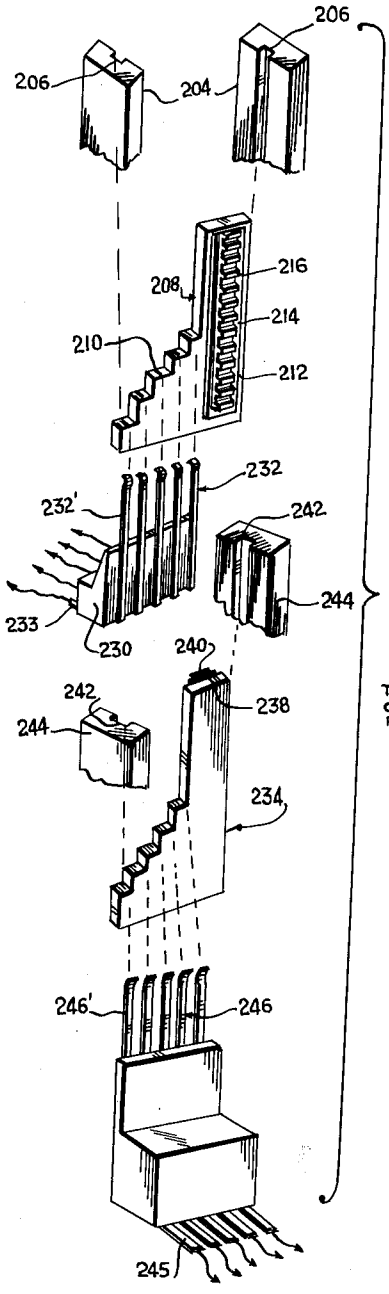

Fig. 10.

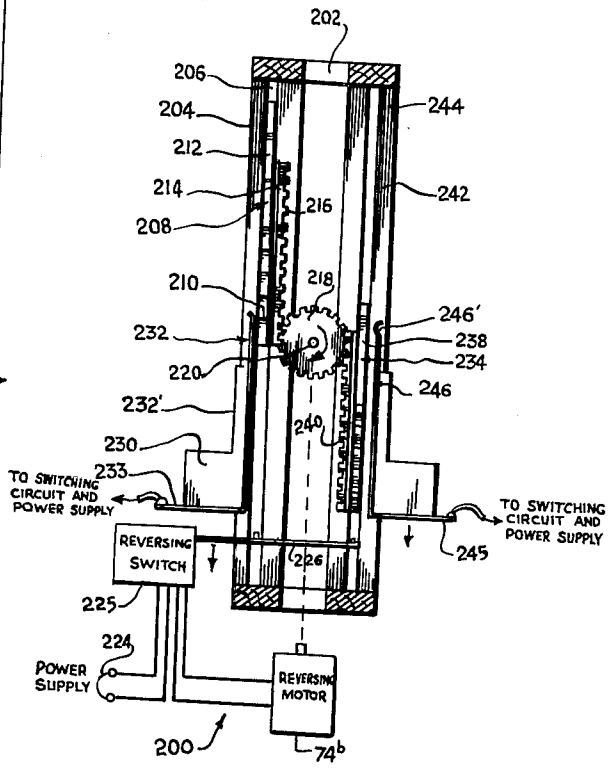

Fig. 9.

INVENTOR.
TOBIAS WAGNER
BY Zoltan A. Blacksp
ATTORNEY

Aug. 10, 1965 T. WAGNER 3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Filed Aug. 16, 1962 5 Sheets-Sheet 5

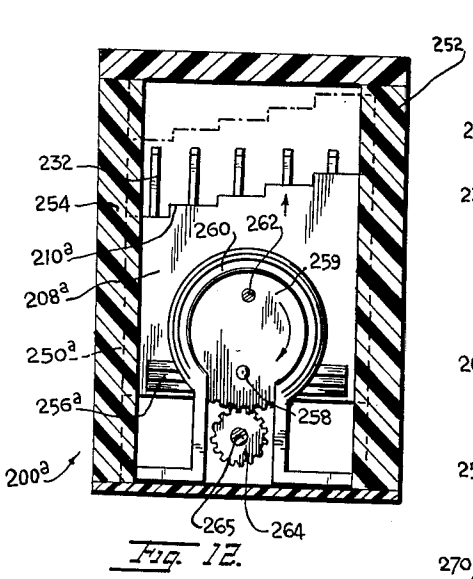

Fig. 12.

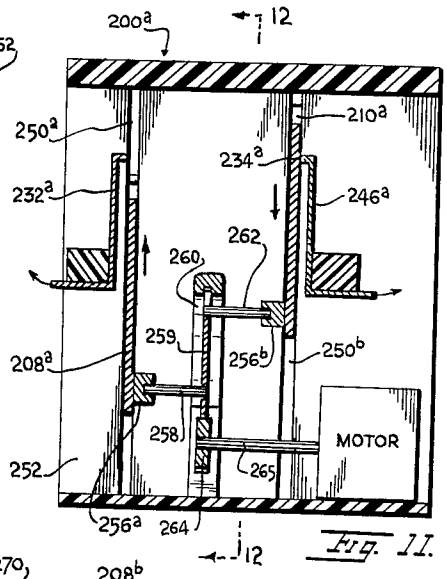

Fig. 11.

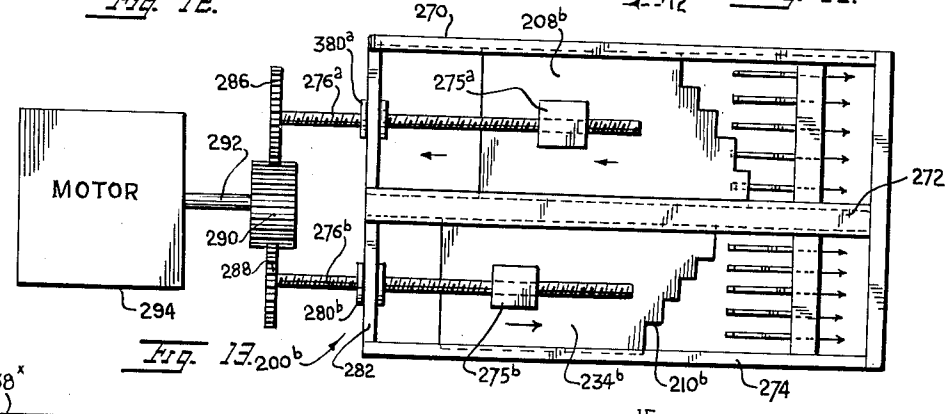

Fig. 13.

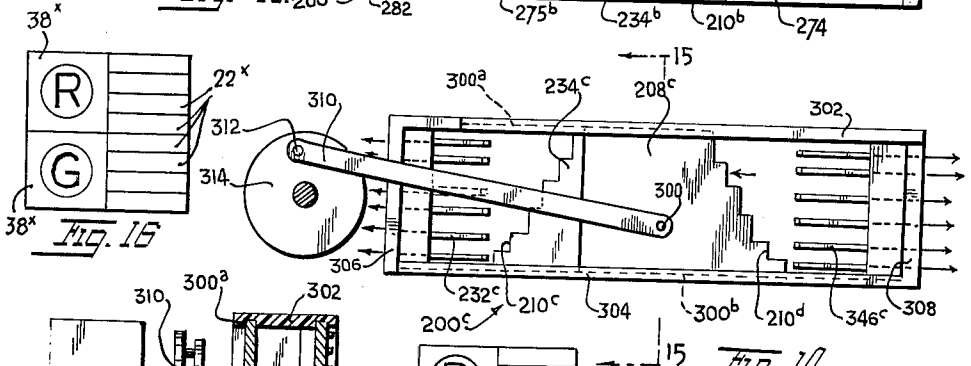

Fig. 16. Fig. 14.

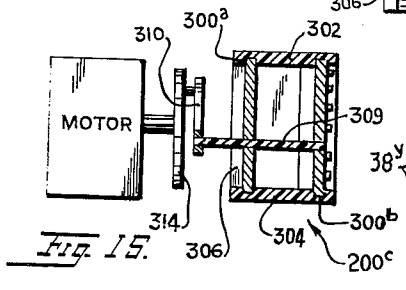

Fig. 15.

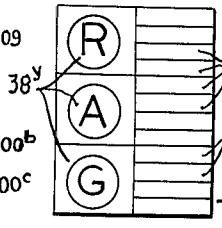

Fig. 17.

INVENTOR.
TOBIAS WAGNER
BY Zoltan Holaday
ATTORNEY

United States Patent Office 3,200,218 Patented Aug. 10, 1965

3,200,218

SAFETY TRAFFIC SIGNAL LIGHTS

Tobias Wagner, 2025 Valentine Ave., Bronx 57, N.Y.

Filed Aug. 16, 1962, Ser. No. 217,356
5 Claims. (Cl. 200—92)

This invention relates to traffic light signals designed to indicate at all times the duration of time remaining before a signal cycle changes or terminates.

Considerable difficulty is experienced by motorists in bringing their automobiles to a stop when a green light suddenly changes to red. Although in many jurisdictions an amber caution light is included, this does not represent a full solution to the problem, since the amber light remains on, usually, only for a very few seconds. Thus, the motorist may be approaching an intersection, maintaining a normal rate of speed sufficient in his judgment to permit him to pass the intersection while he still has a green light, and may be suddenly confronted with an imminent light change when he is almost at the intersection. Under these circumstances, it is necessary that he either bring his vehicle to a sharp stop or alternately, continue on through the intersection despite the fact that the signal may have completely changed before he is fully through the intersection.

It will be seen from the above that it is highly desirable that a motorist be provided with a visual indication, from the time the signal changes until the next change thereof, that will provide him with full knowledge as to the amount of time remaining before the next change. In this way, he can prepare himself further in advance, either for bringing his vehicle to a halt at an intersection, or alternatively, for preparing the vehicle to leave the intersection after it has been stopped thereat by a red light.

The difficulty experienced by motorists is experienced also by pedestrians, who oftentimes, in endeavoring to cross an intersection at which controls exist in the form of traffic lights, find themselves stranded in the middle of the intersection, thereby incurring considerable risk of injury as traffic begins to flow in a different direction.

It has been heretofore proposed to provide a visual indication on a traffic light signal whereby one can determine, generally, the extent of time remaining before the next light change. However, the main object of the present invention is to provide an improved type of device, which will be particularly adapted to provide a visual indication that can be seen at a substantial distance, so that an oncoming motorist can readily perceive the extent of time in a signal cycle remaining before he reaches an intersection and so that pedestrians can perceive the extent of time in the signal cycle remaining during which they can safely cross the intersection or during which they must wait before they can safely cross the intersection.

Another object is to provide a traffic signal with cycled red and green lights with or without an accompanying amber light and having associated signal units divided into illuminated sections which progressively are extinguished during the timing cycles.

A further object is to provide a traffic signal wherein progressively extinguished illuminated sections provide "walk" and "don't walk" indications to pedestrians.

A further object is to provide novel switching means for turning the successive illuminated sections of the traffic signal on and off.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIGS. 1 and 1A are perspective views of traffic signal devices embodying the invention.

FIG. 2 is a sectional view on an enlarged scale taken on line 2—2 of FIG. 1, with an associated switching circuit and power supply shown diagrammatically.

FIGS. 3, 4 and 5 are front elevational views of other traffic signal devices according to the invention.

FIGS. 6 and 7 are diagrams of switching and power supply circuits of the signal devices of FIGS. 3 and 5, respectively.

FIG. 8 is a perspective view of a switching device which may be employed in the traffic signal, certain components being shown schematically.

FIG. 9 is a vertical sectional view of another switching device, with certain components shown schematically.

FIG. 10 is an exploded perspective view of parts of the device of FIG. 9.

FIG. 11 is a vertical sectional view of another switching device.

FIG. 12 is a vertical sectional view taken on line 12—12 of FIG. 11.

FIG. 13 is a side elevational view of another switching device, parts being shown schematically.

FIG. 14 is a side elevational view partially in section of another switching device.

FIG. 15 is a cross sectional view taken on line 15—15 of FIG. 14.

FIGS. 16, 17 and 18 are front elevational views of still other traffic signal devices.

Referring to the drawings, there is shown in FIGS. 1 and 2, a traffic signal device 10 in which five units 11–15 are stacked one above the other and secured in a housing 16. Unit 11 at the top of the assembly includes a front frame 18 in which are a plurality of rectangular openings 20. Behind each opening is a transparent clear or colored lens plate 22. Preferably colored red. A lamp socket 24 is mounted behind each plate 22 on floor plate 25 and carries an electric bulb 26. Each socket is connected via an electric cable 28 to a switching circuit and power supply 30 shown diagrammatically in FIG. 1. This circuit arrangement is explained below in connection with FIG. 6. A tapered rectangularly U-shaped hood 32 extends forwardly from frame 18.

Below unit 11 is unit 12 which has a front panel 34 provided with an opening 36. A transparent clear or colored lens plate 38 is located behind panel 34. Plate 38 is preferably colored red. A lamp socket 40 is mounted on floor plate 42 behind lens plate 38. The socket carries a lamp bulb 44 and is connected by cable 46 to the switching circuit and power supply 30. A curved hood 45 extends forwardly of panel 34.

Unit 13, which is below unit 12, has the same construction as unit 12 except that lens plate 38^a is preferably colored yellow or amber.

Unit 14, which is below unit 13, has the same construction as unit 11 except that lens plates 22^a are preferably colored green.

Unit 15, which is below unit 14, has the same construction as units 12 and 13 except that lens plate 38^b is preferably colored green.

In signal device 10' of FIG. 1A, the same units are employed as in signal device 10 except that units 12, 13 and 15 are disposed in a horizontal array. Unit 11 is placed on top of unit 12 and unit 14 is placed on top of unit 15 as in device 10. Other parts of the device 10' corresponding to those of device 10 are identically numbered.

In FIG. 3 is shown another traffic signal device 10^a. Three units 12^a, 13^a, and 15^a are mounted one below the other. The construction of these units is similar to units 12, 13 and 15, respectively, except that hoods 45^a are shown as rectangular, although they could have other

shapes. The lens plates 38, 38a and 38b of the several units are respectively colored red, amber and green. At one side of the three units is a unit 11a having a plurality of sections in which are exposed lens plates 22' preferably colored red. The internal construction of unit 11a is similar to that already described for unit 11, except that the unit 11a may have a greater number of compartments containing the lamp bulbs. At the other side of units 12a, 13a, and 15a, is another multiple section unit 14a similar to unit 14 except that a greater number of compartments and lens plates 22'' are provided and these lens plates are preferably colored green. The device 10a employs a circuit as shown in detail in FIG. 6.

In FIG. 4, traffic signal device 10b is similar to device 10a, except that unit 13a which contains an amber lens plate is omitted. The laterally disposed units 11b and 14b are substantially identical with units 11 and 14 with red lens plates 22' in unit 11b and green lens plates 22'' in unit 14b. Also the same number of compartments are provided for the lamp bulbs in units 11b and 14b as are provided in units 11 and 14. Device 10b employs a circuit which is explained below in connection with FIG. 6.

In FIG. 5 is shown another traffic signal device 10c. This device has two units 11c and 11d. Unit 11c includes a cabinet 50 having front panels 52 provided with cutouts or apertures 54 spelling out the word "DON'T." Behind the panels are translucent or transparent lens plates 56 preferably colored red. A single lamp bulb 58 is located behind each of the front panels. If desired, bulbs 58 can be colored red. Unit 11c has four compartments divided by horizontal floor plates or panels 60. It is to be understood that one or more lamp bulbs may be provided instead of the single bulb shown at 58. Attached to cabinet 50 by hinge 62 is a rear cabinet 64 which contains a switching circuit and power supply shown schematically in FIG. 7. Unit 11d is similar to unit 11c except that two lamp bulbs 59a and 59b are located in each compartment. The lens plates 56a may be colored red, green or white but are preferably transparent, translucent or any color or uncolored while the lamp bulbs 59a and 59b are respectively colored red, green, white or any other color. In operation of the device, only the green bulbs 59b will light during one part of the operating cycle as will be explained in connection with the circuit of FIG. 7. During another part of the operating cycle as each one red bulb 58 in each compartment of unit 11c lights up a companion red bulb 59a will light up in a compartment on the same horizontal level of unit 11d. Thus, the device will display either "WALK" signs or red "DON'T WALK" signs.

Circuit 30a shown in FIG. 6 is arranged for operation of device 10a of FIG. 3. The circuit includes lamps 44, 44a and 44b which project red, amber and green lights, respectively, through the lenses of the compartments in which they are disposed. A first series of lamps 26 are designated 26A–26F and are disposed in compartments of unit 11a. A second series of lamps 26' designated 26G–26L are located in compartments of unit 14a. Each of the lamps has one terminal connected to common line 60 which terminates at one terminal 61 of a power supply 62. This power supply may be an alternating or direct current source and may be connected to an external source of electric power or to a self-contained battery pack.

A switching device 65 is provided for turning the various lamps on and off in a predetermined timed sequence or cycle. This device includes two rotatable insulated disks or plates 66, 68 mounted and rotated on a common insulated shaft 70 connected to and driven by drive shaft 72 of a continuously driven motor 74. A first insulated arm 76 is disposed radially adjacent disk 66. This arm is held stationary on a support 78. The arm 76 carries a series of spaced brushes or wiper contacts 80a–80g. Each contact has a lug 81 to which is connected a wire 82 terminating at a different one of the red lamps 26A–26F and a power supply terminal 83. A stepped switching plate 84 made of conductive material is secured to disk 66 and is contacted by brushes 80a, 80g as the disk 66 rotates.

Another stationary insulated arm 86 carries spaced brushes or wiper contacts 90a–90h. Each contact has a lug 92 to which is connected a wire 93 terminating at a different one of green lamps 26G–26L and at power supply terminal 83. Arm 86 is disposed radially of disk 68. On the disk is a circular central switch plate 94 with a short circumferential segment 96 extending radially thereof. An arcuate stepped switching plate 98 is disposed radially of the center plate 94 and makes electrical contact with segment 96 and plate 94 at point 99 where plate 98 is soldered or welded to segment 96.

Switching plate 84 has a series of six steps S which are spaced apart predetermined circumferential distances. The steps are uniformly radially spaced apart. Switching plate 98 has a series of six steps S' which are spaced apart predetermined circumferential distances and are uniformly radially spaced apart.

In operation of circuit 30a, brush 80a makes continuous contact with plate 84 as disk 66 rotates. This connects terminal 83 continuously to the contact plate 84. Brush 80b contacts plate 84 only during approximately 180° of the cycle of rotation of the disk. Brushes 80c–80g in turn contact plate 84 for approximately 30° shorter intervals. Brush 90a contacts center plate 94 continuously as disk 88 rotates. Brush 90b contacts segment 96 for a short interval of a few angular degrees. Brush 90c contacts plate 98 for an interval slightly less than 180°. Brushes 90d–90g contact plate 98 for successively shorter intervals, each about 30° or shorter than the next. While brush 90b contacts segment 96 no other brush contacts either of plates 84 or 98. While brushes 90a–90c are contacting plate 98 none of brushes 80b–80g contact plate 84 and vice versa.

Due to the arrangement described it will be apparent that green lamp 44b will be lighted along with all of lamps 26'. Then each of lamps 26G–26L will go out in succession and when lamp 26L goes out, lamp 44b will also go out. Then only the amber lamp 44a will be lighted. When this lamp goes out, all the red lamps 26 will go on along with red lamp 44. Then each red lamp 26A–26F will go out in turn. When lamp 26F goes out, lamp 44 goes out also and a new cycle starts with the lighting of green lamp 44b and lamps 26'.

The device 10a as viewed in FIG. 3, will show all the green lights in unit 13a and unit 15a coming on together. The green lights 26 will go out one at a time from top to bottom, and when the viewer sees the last light on at the bottom of unit 14a he knows that the amber light 44a is about to come on. After the amber light goes out all the red lights in unit 11b come on along with red light in unit 12a. The red lights 26 go out one at a time from top to bottom of the unit and when only the bottom red light remains the viewer knows that the green lights are about to come on and the red light 44 is about to go out, vice versa.

The circuit 30a can be used in the devices 10 and 10' of FIGS. 1, 1A, if six compartments are provided in each of units 11 and 14. If only four compartments are provided in each of units 11 and 14 as illustrated in FIGS. 1, 1A and 2, then contact plates 84 and 98 will be modified by omission of two of each of steps S and S' and spreading out circumferentially the remaining steps.

The circuit 30a can be modified for use in the device 10b of FIG. 4 by omitting the segment 96 and the amber light 44a, leaving only the red and green lights 44 and 44b. In addition, two each of steps S and S' will be omitted from the plates 84 and 98 and the remaining steps will be elongated circumferentially so that the steps of each plate occupy about 180°.

FIG. 7 shows circuit 30b adapted for operating the pedestrian traffic signal 10c of FIG. 5. Each of lamps 58,

59a and 59b has one terminal connected to the common line 60' terminating at terminal 61' of power supply 62'. Terminal 83' is connected via wire 115 to the radially inner one of brushes 112 on stationary arm 110. Arm 110 extends radially of rotating insulation disk 100 carrying conductive switch plate 102. This plate has circumferentially spaced steps 106 and a circular portion 104. The disk 100 rotates on insulated shaft 70' driven by shaft 72' of motor 74'. Wires 114 are connected between the other brushes on arm 110 and the respective red lamps 58.

Terminal 83' is also connected via wire 125 to the radially inner of brushes 124 on stationary arm 122. The other brushes 124 are connected by wires 126 to green lamps 59b. Red lamps 59a are connected in parallel with red lamps 58. Disk 120 carries stepped contact plate 128 having four circumferentially spaced steps 130. When brushes 112 are on the outer stepped portions of plate 102, brushes 124 are off of the outer stepped portions of plate 128.

In operation of 30b and device 10c all the red lights projected by lamps 58 and 59b through their lenses come on together to present red "DON'T WALK" signs. Then the pairs of lamps 58, 59a go out in turn. When the lowermost red lamps 58, 59a go out, the green "WALK" lamps 59b all go on together. These lamps go out one by one as the several brushes 124 pass the several steps 130. When the last green lamp at the bottom of the device goes out, all the red "DON'T WALK" lamps go on together to repeat the cycle. The last one or two green or red lights may be made to flash "on" and "off."

FIG. 8 shows diagrammatically a switching device which can be used in place of the switching devices employing stepped contact plates and brushes of circuits 30a and 30b. Motor 74a drives a cam shaft 150 carrying insulated cam plates or disks 152 spaced axially along the shaft. The cam plates have certain circularly edge portions 154 and other straight edge portions 156 chordal to the curved portions. The cam plates rotate between pairs of spring contacts 158, 160 supported by stationary bus bars 162, 164. The bus bars terminate at a power supply unit 62a. Stationary contact elements or strips 166, 168 are supported on stationary conductive bases 170, 172 and are normally closed with or in contact with contacts 158, 160, respectively. Each of bases 170 is connected to a different lamp L which may be any one of a series of lamps shown in any of devices 10, 10a–10c. Each of bases 172 is connected to a common line 175 connected to one terminal of each lamp.

As the cam shaft 150 rotates, each cam plate will separate a pair of spring contacts 158, 160 when the arcuate edge portions of the cam plate pushes the contacts outwardly to open the circuit normally closed through associated contact strips 166, 168. This opens the power supply circuit of the lamp associated with the open contacts and the lamp goes out. The arcuate and flat edges of the cam plates are arranged so that the lamps go out in turn as their power supply circuits are opened. This is the same function accomplished by the switching plates in circuits 30a and 30b.

FIGS. 9 and 10 illustrate another switching device which can be used in place of the switching devices employing stepped contact plates and brushes of circuits 30a and 30b. The switching device 200 includes a frame 202 having a first pair of vertical rails 204 provided with opposing grooves 206 in which is slidable a first flat electrical contact plate 208. Plate 208 has a series of steps 210 formed in its upper edge. A lateral portion 212 of the plate carries an insulation strip 214 on which is a rack gear 216 extending longitudinally of the plate.

Gear 216 is engaged by a spur gear 218 mounted on a shaft 220 and driven by a motor 74b. The motor is of reversing type. It is connected in circuit with power supply terminals 224 and a reversing switch 225 which may be a double-pole double-throw switch. The switch has an operating arm 226 which is contacted by bottom

edge of plate 208 at the lower end of travel of the plate so that the switch is thrown and the motor is reversed.

An insulation block 230 carrying spaced vertical contact elements or strips 232 is located so that the elements will contact plate 208 for different lengths of time as the plate moves vertically while being driven by gear 218.

Another contact plate 234 has steps 236 formed on its upper edge. Plate 234 faces plate 208 and carries an insulation strip 238 on which is another rack gear 240 facing rack gear 216. Rack gear 240 is also engaged by gear 216 which drives the plate 234 vertically in opposite directions to plate 208, so that when plate 208 is descending plate 234 is rising and vice versa. Plate 234 is guided in grooves 242 between two other rails 244 forming part of frame 202. Contact strips or elements 246 are vertically disposed to contact plate 234 for different periods of time as the plate moves vertically. Elements 246 are mounted on insulation block 250. Contact elements 232 and 246 have lugs 233, 245 which will be connected in circuit with the lamps, in place of the brushes of circuits 30a and 30b while the contact plates 208 and 234 will replace the contact elements carried by the rotating disks in those circuits.

It will be apparent from an inspection of FIGS. 9 and 10, that the left contact elements 232' and 246' will contact plates 208 and 240 for the shortest periods of time while motor 74b rotates at uniform speed. When plate 234 reaches the bottom of its travel between rails 244 it contacts operating arm 226 of the reversing switch and again reverses the motor. Thus, each time a plate 208 or 234 reaches the bottom of its travel it reverses the motor at the same time that the other plate reaches the upper end of its travel. In FIG. 9, plate 234 is just about to contact arm 226 to effect reversing of the direction of motor travel. When elements 232 are contacting plate 208 elements 246 are out of contact with plate 234 and vice versa.

The construction of the switching device 200 is preferred for some installations where reciprocating rather than rotating contacts are desired.

FIGS. 11 and 12 show another switching device 200a, having another arrangement for reciprocating contact plates 208a and 234a provided with steps 210a. The plates are movable in opposite directions in parallel grooves 250a, 250b formed in parallel insulated walls 252, 254. Each plate carries a horizontal insulated channel bar 256a, 256b. A first crank pin 258 slidably engages in the channel of bar 256a. This pin is eccentrically carried by a spur gear 259 rotatably in a channel ring 260. Another pin 262 diametrically opposed to pin and extending oppositely from gear 259 and is slidably disposed in the channel of bar 256b. A gear 264 on a shaft 265 is driven by a motor 266 rotates gear 259 and causes the plates 208a, 234a to slide in opposite directions. The steps of the plates alternately contact respective sets of contact elements 232a, 246a and the contact elements in each set respectively contact each contact plate for different lengths of time in a manner similar to that explained for the device 200. The contact elements will be connected to circuits 30a or 30b in place of the switching devices therein employing stepped contact plates and brushes.

FIG. 13 shows another switching device 200b having another arrangement for reciprocating contact plates 208b, 234b each provided with steps 210b. The plates move in parallel grooves formed between parallel walls, 270, 272, 274. Insulated nuts 275a, 275b are secured to sides of the plates and receive threaded shafts 276a, 276b. The shafts are journaled in bearings 280a, 280b, in an end wall 282 joining walls 270, 272, 274. The shafts have gears 286, 288 at their outer ends driven by a gear 290 on the end of a shaft 292 of motor 294. When the motor is running the threaded shafts are turned in opposite directions so that the plates 208b, 234b move in opposite directions. Thus the sets of contact elements 232b, 246b alternately contact the plates and the elements in each set con-

tact the associated contact plate for a different length of time. The contact elements may be connected to circuits 30^a or 30^b in place of the switching devices employed therein.

In FIGS. 14 and 15 is shown another switching device 200^c having another arrangement for reciprocating contact plates 208^c, 234^c. The plates are slidably disposed in grooves 300^a, 300^b formed in opposed insulated walls 302, 304 secured together by end walls 306, 308. A shaft 309 passes through the parallel plates and engages a drive shaft 310 which is connected by pin 312 to a crank or drive wheel 314. The wheel is rotated by a motor 316. The steps 210^c and 210^d of the respective contact plates extend in opposite directions and alternately contact the sets of contact elements 232^c, 246^c. The elements in each set contact their associated contact plate for different lengths of time. The contact elements may be connected to the circuits 30^a, or 30^b in place of the switching devices employed therein.

The invention may thus employ several different switching devices for automatically and cyclically turning off the green and red lights in a traffic signal for motorists and pedestrians. The traffic signal device may include time lapse signals in association with red and green signals with or without an amber warning signal; or the device may consist only of time lapse pedestrian signals. The several time lapse signals can be disposed in vertical arrays in a vertical assembly with the red and green lights with or without an amber light; or the time lapse signals can be disposed in vertical arrays alongside of vertical arrays of the red and green lights with or without an amber light.

The signal lights can be disposed in horizontal or vertical arrays, or in any other formation. And the differently colored lights may be interchanged from the positions shown in the drawing.

All of the various modes of operation described above can be controlled remotely by means of well known radio control circuits. The remotely controlled devices can be made responsive to a fixed frequency or to a combination of frequencies or to coded signals. The traffic signals can be controlled by vehicle counter devices which register traffic loads and can be set to vary the timing of the traffic signals in response to traffic loads.

In FIG. 16 two round lens plates 30^x are shown on one side and the corresponding parallel plates 22^x are shown on the other side. In FIG. 17 three sets of similarly arranged plates 30^y and 22^y are shown. In FIG. 18, the "DON'T WALK" plates 38^z are shown on one side and the corresponding parallel plates 22^z on the other side.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In a traffic signal assembly having differently colored lights, switching means for successively turning the lights on and off, comprising a pair of contact plates each having a series of steps at one end, means for reciprocating the plates cyclically, two sets of contact elements, said sets being disposed to contact respective contact plates alternately, the contact elements in each set contacting a contact plate for a different length of time as the plate is reciprocated by the reciprocating means.

2. In a traffic signal assembly having differently colored lights, switching means for successively turning the lights on and off, comprising a pair of contact plates each having a series of steps at one end, means for reciprocating the plates cyclically, two sets of contact elements, said sets being disposed to contact respective contact plates alternately, the contact elements in each set contacting a contact plate for a different length of time as the plate is reciprocated by the reciprocating means, said reciprocating means including a motor, a circular drive means operatively driven by said motor, crank pins eccentrically carried by said drive means and disposed at diametrically opposed points, said pins engaging the plates respectively, and guide means for guiding the plates to move in different directions alternately as the drive means is driven by said motor.

3. In a traffic signal assembly having differently colored lights, switching means for successively turning the lights on and off, comprising a pair of contact plates each having a series of steps at one end, means for reciprocating the plates cyclically, two sets of contact elements, said sets being disposed to contact respective contact plates alternately, the contact elements in each set contacting a contact plate for different length of time as the plate is reciprocated by the reciprocating means, said reciprocating means including a motor, a drive gear operatively driven by said motor, crank pins eccentrically carried by said gear and disposed at diametrically opposed points, said pins engaging the plates respectively, and guide means for guiding the plates to move in different directions alternately as the drive gear is driven by said motor.

4. In a traffic signal assembly having differently colored lights, switching means for successively turning the lights on and off, comprising a pair of contact plates each having a series of steps at one end, means for reciprocating the plates cyclically, two sets of contact elements, said sets being disposed to contact respective contact plates alternately, the contact elements in each set contacting a contact plate for a different length of time as the plate is reciprocated by the reciprocating means, said reciprocating means including a motor, a drive gear operatively driven by said motor, threaded shafts operatively driven in different directions by said gear, nuts carried by said plates and engaged by said threaded shafts, and guide means for guiding the plates to move in different directions alternately as the drive gear is driven by the motor.

5. In a traffic signal assembly having differently colored lights, switching means for successively turning the lights on and off, comprising a pair of contact plates each having a series of steps at one end, means for reciprocating the plates cyclically, two sets of contact elements, said sets being disposed to contact respective contact plates alternately, the contact elements in each set contacting a contact plate for a different length of time as the plate is reciprocated by the reciprocating means, said reciprocating means including a motor, a crank means operatively driven by the motor, a crank shaft connected to said crank means and reciprocated thereby, means connecting said crank shaft to said plates, and guide means for guiding the plates to reciprocate as the crank shaft is reciprocated.

References Cited by the Examiner

UNITED STATES PATENTS

2,285,168	6/42	Peterson	340—43
2,842,627	7/58	Wagner	340—43

FOREIGN PATENTS

112,058 12/40 Australia.

NEIL C. READ, *Primary Examiner.*

THOMAS B. HABECKER, *Examiner.*