Nov. 3, 1953 S. HASKIN 2,658,187

TRAFFIC CONTROL INDICATOR OF THE CLOCK TYPE

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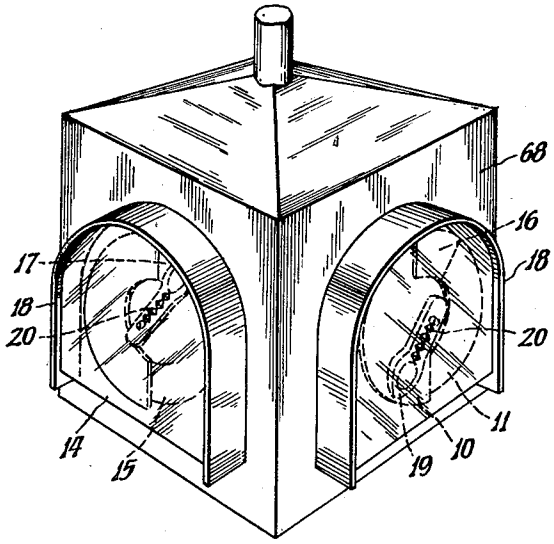


FIG. 1.

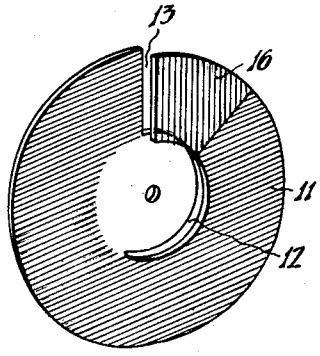


FIG. 2.

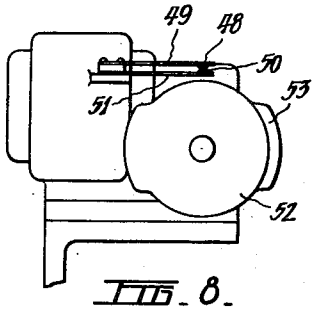


FIG. 8.

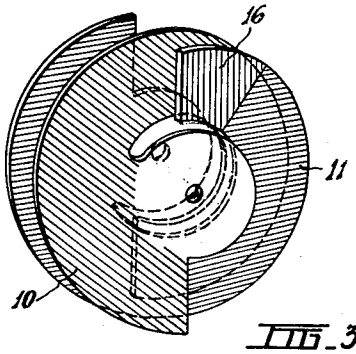


FIG. 3.

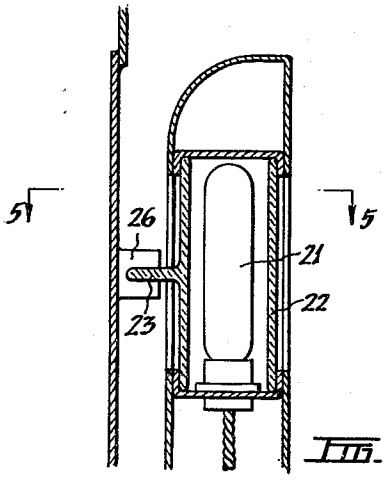


FIG. 4.

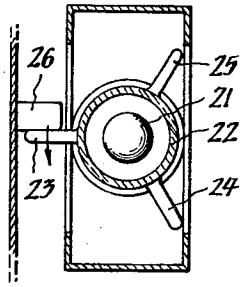


FIG. 5.

Inventor
Simon Haskin
By
Munn, Liddy & Glaccum
Attorneys

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TRAFFIC CONTROL INDICATOR OF THE CLOCK TYPE

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3 Sheets-Sheet 2

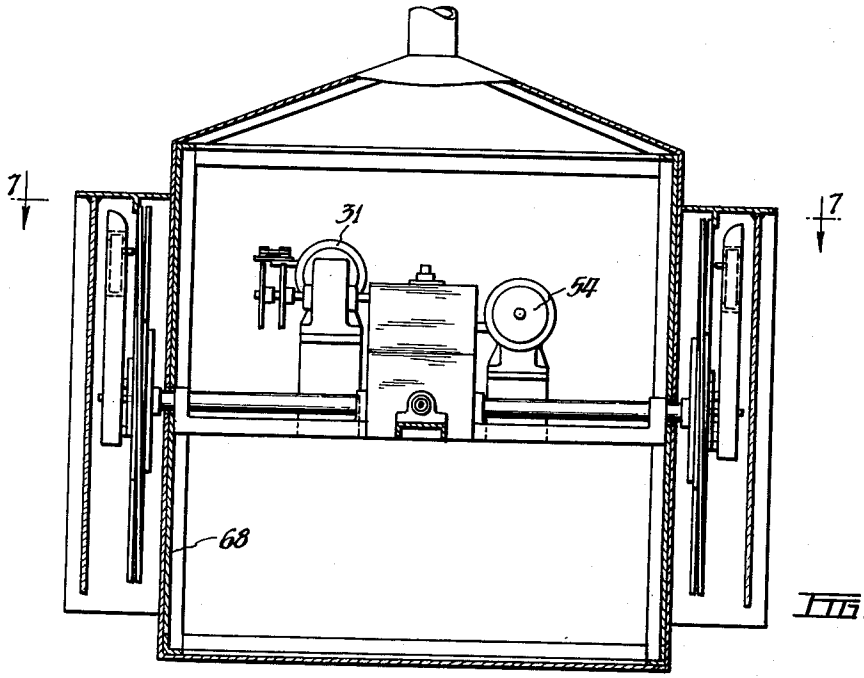


FIG. 6.

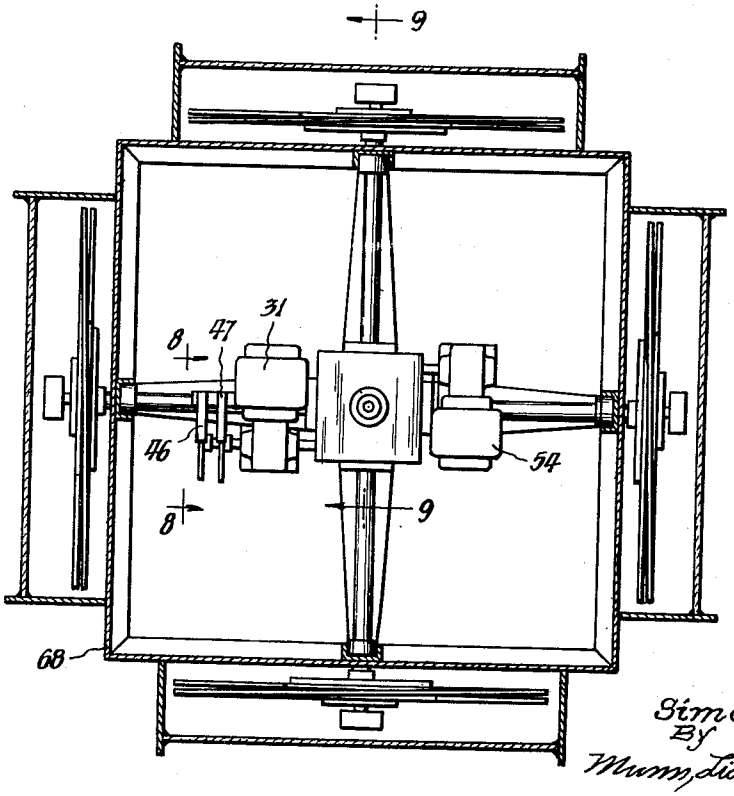


FIG. 7.

Inventor
Simon Haskin
By
Mum, Liddy & Glaccum
Attorneys

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TRAFFIC CONTROL INDICATOR OF THE CLOCK TYPE

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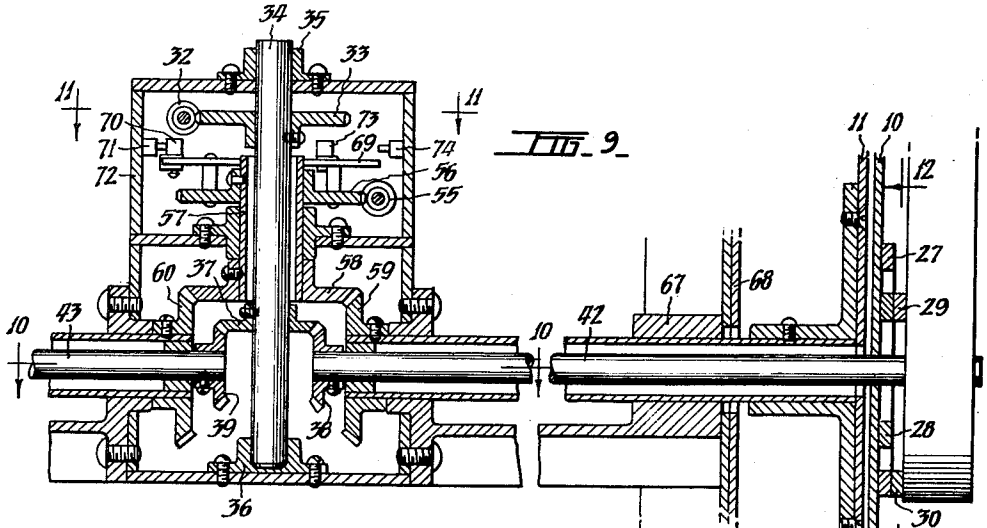


FIG. 9

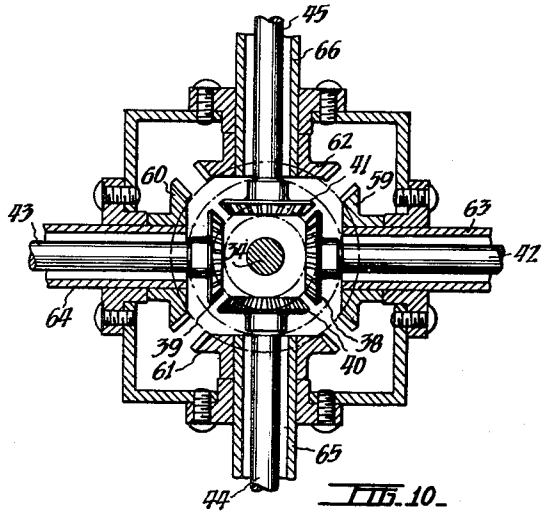


FIG. 10

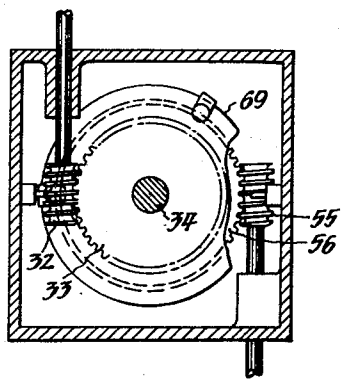


FIG. 11

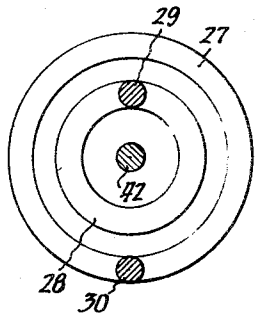


FIG. 12

Inventor
Simon Haskin
By
Munn, Liddy & Glascock
Attorneys

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UNITED STATES PATENT OFFICE

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TRAFFIC CONTROL INDICATOR OF THE CLOCK TYPE

Simon Haskin, North Carlton, Victoria, Australia

Application August 28, 1951, Serial No. 244,040

10 Claims. (Cl. 340—43)

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This invention relates to traffic control indicators of the type in which an indicator arm moves continuously over a dial composed of differently coloured portions which indicate respectively whether the roadway is clear or whether traffic in that direction is to stop. Normally one half of the dial is red and the other green, while sometimes an amber portion is provided between the green and the red so that the indicator hand does not pass directly from the green to the red. This type of traffic control indicator is referred to herein as a traffic control indicator of the clock type. This type of indicator has the great advantage that the driver of an approaching vehicle can see at a glance what fraction of the interval is unexpired and thus in the case of the "road clear" signal he can judge whether he has time to cross the intersection. With known constructions of clock type traffic control indicators, there is no provision for varying the relative durations of the two periods.

The object of this invention is to enable the duration of one period to be increased and that of the other to be decreased according to the amount of traffic in one direction as compared with the amount of traffic in the other direction; thus, for example, it may be desirable at certain periods of the day to allow for the passage of a greater quantity of traffic along one road than along a cross road while at other periods of the day the traffic requirements may be different.

This object is achieved by the present invention, according to which the areas of the two coloured parts of the dial representing the "clear" and "stop" signals are adjustable in relation to each other. The dial is formed of two slotted discs in each of which there is a slot having an arcuate portion forming part of the circumference of a circle of substantially smaller diameter than that of the disc and concentric with the disc, and at one end this slot extends across the outer portion of the disc in a radial direction. Each disc thus has an arcuate portion which is separated by the slot from the rest of the disc except where the inner end of the slot terminates. These discs are arranged so that the central portion of one disc is positioned in front of the central portion of the other disc and one disc is reversed in relation to the other, the free end of the arcuate portion of one disc being passed in front of the corresponding portion of the other disc. The central portion of the front disc, or in other words the circular portion corresponding to the space bounded by the arcuate portion of the slot and an imaginary continuation thereof, is of a neutral colour as it is not concerned with the indication of the control device. When one of these discs is turned in relation to the other, either more red and less green or more green and less red will become visible. Normally one disc will be stationary and one disc capable of partial or complete rotation. By having the arcuate slots extending over an angle of more than 180° and the discs reversed relatively to each other in the manner described above, the dial can be made to show all red or all green (except for the amber-coloured portion), thus enabling streets to be entirely closed to traffic if necessary or to carry traffic in one direction only.

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The device may be controlled entirely manually by any suitable simple control gear or it may be controlled electro-mechanically, the direction of movement depending upon which of two control buttons is pressed. Preferably, however, it is controlled automatically, by a time clock for example, so as to vary the relationship of the red and green areas according to the time of day.

To attract the attention of a person approaching the traffic control indicator, the indicator arm carries an electric light which is switched off and on automatically as the arm revolves, to provide frequently occurring flashes of light corresponding in colour to the colour on the dial over which the indicator arm happens to be passing at the time.

Other advantages and features of the invention appear from the accompanying drawings, the subjoined detailed description and the appended claims. In these drawings—

Figure 1 is a perspective view of a traffic control indicator in accordance with the invention,

Figure 2 is a perspective view of one of the coloured discs,

Figure 3 is a perspective view of a co-operating pair of coloured discs,

Figure 4 is a sectional view through the outer end of an indicator arm,

Figure 5 is a sectional view on the line 5—5 in Figure 4,

Figure 6 is a view in sectional elevation through the traffic control indicator,

Figure 7 is a sectional plan view on the line 7—7 in Figure 6,

Figure 8 is a view in end elevation on the line 8—8 in Figure 7,

Figure 9 is an enlarged view in sectional elevation on the line 9—9 in Figure 7,

Figure 10 is a sectional plan view on the line 10—10 in Figure 9,

Figure 11 is a sectional plan view on the line 11 in Figure 9, and

Figure 12 is a view in sectional elevation on the line 12—12 in Figure 9.

Referring now to the drawings, an indicator unit will normally comprise four dials disposed at 90° to each other so that each dial can face along one road leading to an intersection. The unit can be suspended at the centre of the intersection or mounted on a post or pillar in the normal manner. Each dial is formed in two parts, one part comprising a fixed disc and the other part comprising a disc which can be rotated relatively to the fixed disc. Both discs are of similar size, are mounted co-axially and are similarly slotted in the manner shown in Figures 2 and 3. Each disc contains an arcuate slot 12 forming part of the circumference of a circle of substantially smaller diameter than that of the disc and concentric with the disc, and a slot 13 which joins one end of the slot 12 and extends radially across the outer portion of the disc. Each disc thus has an arcuate portion which is separated by the slots 12, 13 from the rest of the disc except where the inner end of the slot 12 terminates. Each pair of discs is arranged so the central portion of one disc is positioned in front of the central portion of the other and one disc is reversed in relation to the other, the free end of the arcuate portion of the rear disc being disposed in front of part of the front disc and vice versa. In one pair of dials which face in opposite directions, the movable disc 11 is coloured red except for a small portion 16 adjacent the radial slot which is coloured amber, while the fixed disc 10 is coloured green. In the other pair of dials, the movable disc 14 is coloured green while the fixed disc 15 is coloured red except for a small portion 17 adjacent the radial slot which is coloured amber. Each dial is provided with a canopy 18 carrying electric lamps which illuminate the dial.

Each dial carries an indicating arm 19 which is rotated by mechanism described hereinafter. Each of the arms are provided with reflectors 20 on their front surfaces to catch the light directed on to them from under the canopy and throw portion of it on to the portion of the dial over which the arm is passing. These reflectors 20 will also cause a certain amount of flashing to be visible on the arm, which will assist in attracting the attention of a driver or pedestrian approaching the control indicator. Each indicator arm houses an electric light globe 21 adjacent its outer end, the light being visible through a coloured transparent cylindrical screen 22 fitted into the arm. To supply current to the globe 21, energised rings 27, 28 are provided on the front disc of each dial, such rings being wiped by carbon brushes 29, 30 provided on the respective arms. The screen 22 is divided into three equal parts longitudinally, one part being red, another green and the other amber. Radially projecting lugs 23, 24, 25 are fixed to the screen and are adapted to come into contact, one after the other, with three projections 26 fixed on the discs at the junctions of the different colour sectors. As the arm rotates around the dial, a lug on the screen will come into engagement with a projection 26 when the arm crosses a junction line between colours, thus causing the screen to rotate and bring that portion of the screen in front of the globe 21 corresponding in colour to the colour of the area over which the arm is to pass. This is repeated at each junction line and thus the colour of the illumination at the end of the indicator arm is kept constantly synchronized with the colour of that portion of the dial over which the arm is passing.

In a modification, the reflectors 20, instead of being attached directly to the arm, are mounted on a cylindrical sleeve which is mounted on the arm between the pivot point and the electric globe. The sleeve is provided with a rubber or other friction wheel which bears against the face of the dial as the arm moves around the dial, thus causing the sleeve and the reflectors thereon to revolve around the arm as the latter moves around the dial.

The indicating arms are driven by an electric motor 31 which operates a worm 32 engaging worm wheel 33. This wheel is fixed on vertical shaft 34 which is mounted in upper and lower bearings 35, 36 respectively. The shaft 34 carries a horizontal bevel gear 37 which meshes with four vertical bevel gears 38, 39, 40 and 41 carried on the driving shafts 42, 43, 44 and 45 respectively. These shafts are connected to the respective indicator arms and cause them to rotate in unison in front of the dials.

The electric supply circuit through which the rings 27, 28 on the dials are energised includes two switches 46, 47; one switch controlling the supply to two of the arms and the other switch controlling the supply to the other two arms. Each switch includes a downwardly directed upper contact 48 mounted on a rigid bar 49 and an upwardly directed lower contact 50 mounted on a flexible bar 51. The lower contacts are normally separated from the upper contacts but are adapted to be raised periodically by cams 52, 53 so as to engage the upper contacts and thereby close the switches during a part of each rotation of the cams. This alternate opening and closing of the globe circuits results in flashes of light being produced at the outer ends of the indicating arms and this effect also tends to arrest the attention of a driver or pedestrian approaching the control indicator.

The relative positions of the red and green discs and accordingly the relative proportions of the red and green areas which are visible, is controlled by electric motor 54. This motor drives worm 55 and worm wheel 56 which is fast on sleeve 57 surrounding the shaft 34. Horizontal bevel gear 58, which is secured to and rotatable with sleeve 57, meshes with four vertical bevel gears 59, 60, 61 and 62 which are secured to horizontal sleeves 63, 64, 65 and 66 carried on shafts 42, 43, 44 and 45 respectively. The outer ends of the sleeves 63, 64, 65 and 66 are each supported in bearings 67 attached to the walls of the casing 68 and connected to the rear side of the movable disc in each instance. Operation of the motor 54 will thus cause simultaneous rotation of the four movable discs so as to vary the relative proportions of the red and green areas visible on the dials. As in each pair of oppositely directed dials, discs of the same colour are adapted to be thus rotated, and the movable discs in one pair are coloured red while the movable discs in the other pair are coloured green, it is obvious that operation of the electric motor 54 will simultaneously increase the amount of red visible in one pair of dials and increase the amount of green visible in the other pair of dials and that the amount by which the red increases in one pair will be equal to the amount by which the green increases in the other.

By manual operation of the motor 54, it is thus possible for the time of a complete revolution of

the indicator arm around the dial to be divided between the "clear" period and "stop" period in any desired proportion.

The proportion between the "clear" and "stop" periods may also be adjusted automatically at certain periods of the day when it may be desirable to allow for the passage of a greater quantity of traffic along one road than along a cross road while at other periods of the day the traffic requirements may be different.

This automatic adjustment is best controlled by means of a time clock which is adapted to start the motor 54 at any desired period of the day. To switch off the motor after the movable discs have been rotated through the desired angle, a disc 69 is mounted at the upper end of sleeve 57 and is provided with upstanding abutments 70, 73 which can be fixed on the disc at any desired circumferential position. After the motor 54 has been put into operation by means of the time clock, it will continue to rotate the movable discs in the dial and disc 69 until an abutment comes into contact with one of the switches 71, 74 provided on the walls of the housing 72. When this occurs, the switch contacted by the abutment will be operated to switch off the motor.

At a later period of the day it may be desired to restore the dials to their original relative positions. In this case the time clock will act, when desired, to start the motor so that it rotates the movable discs in the dials and the disc 69 in the reverse direction to their previous respective movements. This reverse movement will continue until the other of the abutments comes into contact with the other switch whereby the motor is cut off.

By this method it is obvious that the adjustment of the relative proportions of the red and green areas can be effected automatically at any desired period of the day or night and that the variation in such proportions can be controlled by altering the circumferential distance separating the abutments 70, 73.

I claim:

1. In a traffic control indicator of the clock type, two discs co-acting to form a dial, an indicator arm adapted to rotate in front of the dial, and electric light globe carried on said arm, a cylindrical transparent screen around said globe formed with different coloured sections, and interengaging means mounted on the arm and on one of the discs adapted to rotate the screen and produce different coloured lighting effects as the arm rotates in front of the dial, each disc being slotted along portion of the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

2. In a traffic control indicator of the clock type, two discs co-acting to form a dial, each disc being slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

3. In a traffic control indicator of the clock type, a plurality of dials facing in different directions, each dial comprising a pair of co-acting discs each slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the co-acting discs in each dial being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

4. In a traffic control indicator of the clock type, a plurality of dials facing in different directions, each dial comprising a pair of co-acting discs each slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, indicator arms adapted to rotate in front of the dials, driven shafts to rotate said indicator arms, gear wheels on said shafts, a master gear wheel meshing with the gear wheels on said shafts and a drive shaft carrying said master gear wheel, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the co-acting discs in each dial being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

5. In a traffic control indicator of the clock type, a plurality of dials facing in different directions, each dial comprising a pair of co-acting discs each slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, indicator arms adapted to rotate in front of the dials, driven shafts to rotate said indicator arms, gear wheels on said shafts, a master gear wheel meshing with the gear wheels on said shafts and a drive shaft carrying said master gear wheel, sleeves around the driven shafts each connected to one of the discs in a different dial, gear wheels on said sleeves, a master gear wheel meshing with the gear wheels on said sleeves and a driven sleeve around said drive shaft and carrying the last-mentioned master gear wheel, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the co-acting discs in each dial being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc

and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

6. In a traffic control indicator of the clock type, two discs co-acting to form a dial, each disc being slotted along portion of the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, an indicator arm adapted to rotate in front of the dial, a driven shaft to rotate said indicator arm, an electric motor adapted to drive said shaft, means adapted to rotate one of the discs relatively to the other through any desired angle, such means comprising a sleeve around the driven shaft and an electric motor adapted to rotate said sleeve, a time clock adapted to start the last-mentioned electric motor at a predetermined time, a plate rotatable with said sleeve, abutments on said plate and switches adapted to stop the last-mentioned electric motor when engaged by said abutments, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

7. A traffic control indicator of the clock type comprising four dials disposed at 90° intervals, each dial comprising two co-acting discs each slotted along portion of the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, indicator arms adapted to rotate in front of the dials, driven shafts to rotate said indicator arms, gear wheels on said shafts, a master gear wheel meshing with the gear wheels on said shafts and a drive shaft carrying said master gear wheel, sleeves around the driven shafts each connected to one of the discs in a different dial, gear wheels on said sleeves, a master gear wheel meshing with the gear wheels on said sleeves and a driven sleeve around said drive shaft and carrying the last-mentioned master gear wheel, a worm wheel on said driven sleeve, a worm driving the worm wheel and an electric motor driving the worm, a time clock adapted to start the electric motor in one direction at a predetermined time and to re-start the motor in the reverse direction at a later time, a disc on the said driven sleeve, abutments adjustable around the circumference of said disc, and switches adapted to stop the said motor when engaged by said abutments, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the co-acting discs in each dial being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcutae slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

8. In a traffic control indicator of the clock

type, two discs co-acting to form a dial, an indicator arm adapted to rotate in front of the dial, an electric light globe carried on said arm, annular contacts on the front disc and wiping contacts on the arm adapted to remain in electrical connection with the annular contacts during rotation of the arm, each disc being slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

9. In a traffic control indicator of the clock type, two discs co-acting to form a dial, an indicator arm adapted to rotate in front of the dial, an electric light globe carried on said arm, and interrupting means adapted to alternately make and break the supply circuit to said globe, each disc being slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

10. In a traffic control indicator of the clock type, two discs co-acting to form a dial, an indicator arm adapted to rotate in front of the dial, and reflectors mounted on said arm, each disc being slotted along an arc extending for more than half the circumference of a circle of smaller diameter than that of the disc and concentric with the disc, the arcuate slot in each disc being connected with a radial slot extending from one end of the arcuate slot outwardly to the periphery of the disc, the discs being arranged co-axially and reversed relatively to each other, the free end of the annular portion of the rear disc defined by the arcuate slot being disposed on the front side of the front disc and the free end of the annular portion of the front disc defined by the arcuate slot being disposed on the rear side of the rear disc.

SIMON HASKIN.

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