May 6, 1930. O. E. JOHNSON 1,757,050

TRAFFIC SIGNAL

Filed March 15, 1928

Fig. 1.

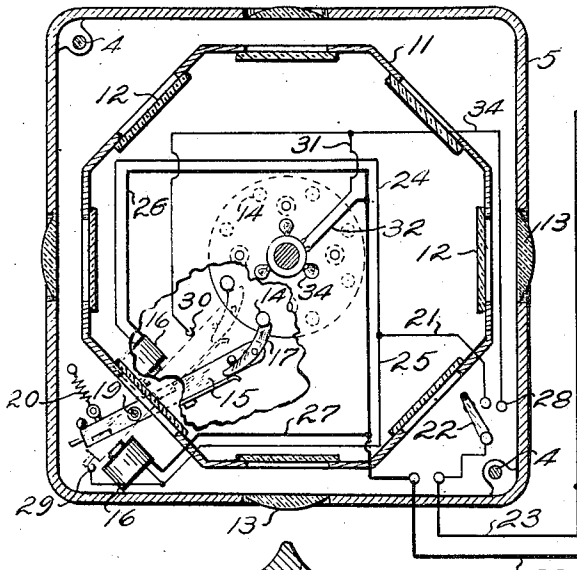


Fig. 2.

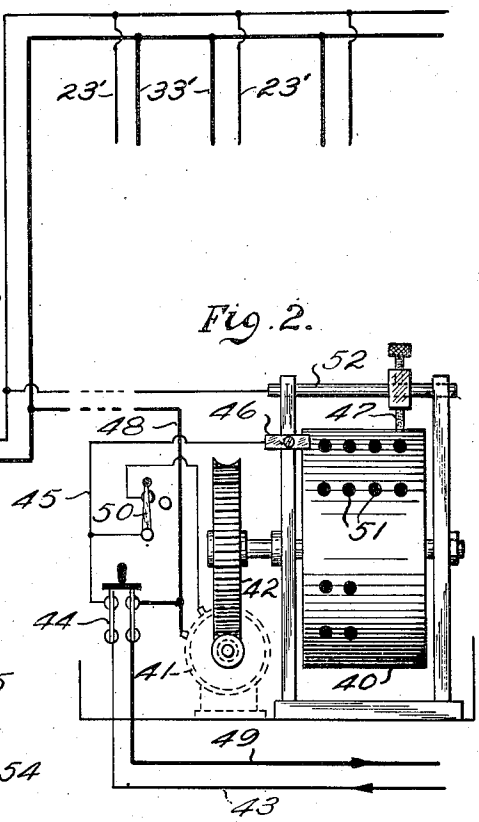


Fig. 3.

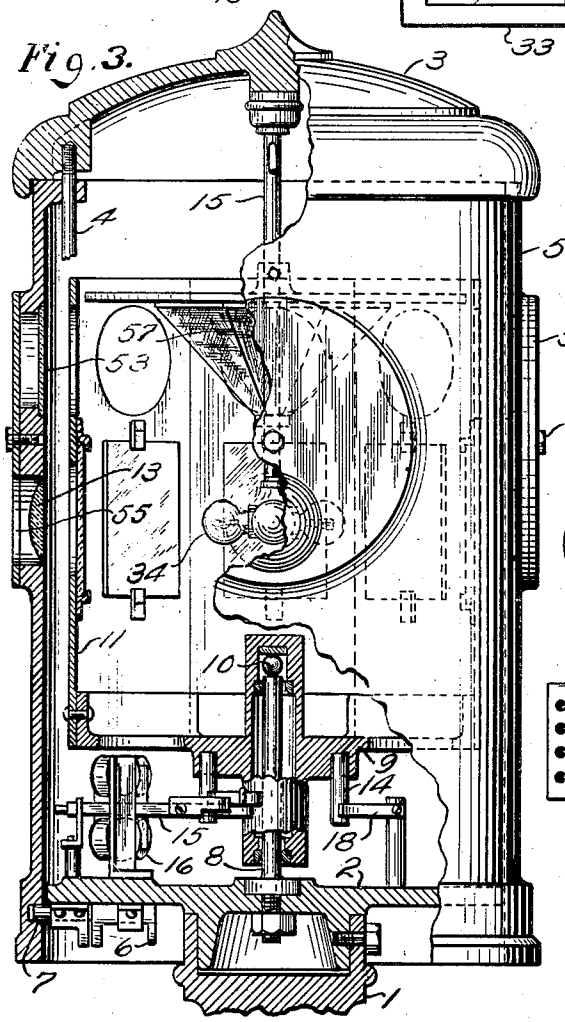


Fig. 4.

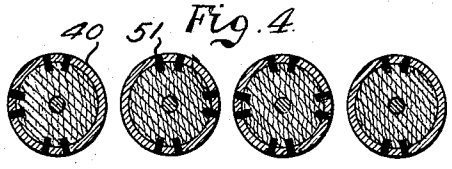
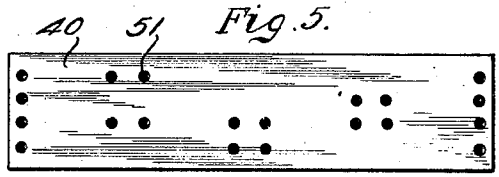


Fig. 5.



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TRAFFIC SIGNAL

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This invention relates to electrically operated traffic signals intended for use at street intersections.

The purposes of the invention are to provide a simple and reliable construction wherein differently colored signals will become visible through the same lenses at required intervals and to provide a simple means for changing the timing of said signals; to provide means whereby the same signals may be continuously displayed when desired or certain signals continuously displayed in one direction while signals in the other direction alternate as usual; and to provide convenient means for individual and group control of a plurality of signalling devices.

The objects of the invention are accomplished by a construction as shown in the accompanying drawings, in which:

Figure 1 is a plan view including one of the signalling devices in section and a wiring diagram for a plurality of such signalling devices.

Fig. 2 is a view in elevation showing a commutator device for controlling the signals and the wiring connections for the commutator and motor for driving the same.

Fig. 3 is a view in elevation and partly in section of one of the signalling devices.

Fig. 4 illustrates a plurality of sections through the commutator, and

Fig. 5 is a projected plan view of the commutator.

The apparatus by which the invention is carried into practice consists of a plurality of electrically operated signalling devices which are arranged in multiple in a two-wire circuit, under the control of a distantly located commutator having a brush which is adjustable into different contact relationships with the commutator. By this adjustable brush the time interval between signals may be varied. Each signaling device for location at street intersections consists of a casing provided with a set of lenses each facing in a different direction, and means within the casing for alternately changing the color of the light at each lens.

In the drawings 1 indicates a supporting post for one of the signalling devices. Secured to the upper end of this post is a base plate 2 which is connected to a cover 3 by tie rods 4. A casing 5 is slidably mounted on the tie rods 4 and normally held in its upper position by a latch 6 extending into a recess 7 in the case. The base 2 of the signalling device has a central upwardly extending post 8 which supports a rotatable drum shaped signal color determining means 9. This color determining means rests upon the ball 10 at the upper end of the post. The upwardly extending wall 11 of the drum 9 is preferably octagonal in form as shown in Fig. 1 and carries a plurality of differently colored glass windows 12 for registering with the glass lenses 13 in the casing 5. A cluster of incandescent lamps 34 is suspended from the top 3 by rod 15. The light from these lamps serves to illuminate the lenses 13 through the colored windows 12. The windows are arranged so that while red is exposed through two of the lenses green will be exposed through the remaining two lenses. There are four amber windows between the red and the green. The windows in the drum 9 are successively brought before the lens by rotating this drum with a step-by-step motion arranged to allow a regulatable time interval between the movements of the drum.

The ratchet means for imparting a step-by-step movement to the drum 9 consists of a series of pins 14 projecting downwardly from the base of the drum and a coacting operating lever 15. The lever 15 is actuated by magnets 16 and carries a pawl 17 for engaging pins 14 in one direction of movement of the lever and idly ride over such pins in the opposite movement of the lever. To prevent the drum 9 from overrunning or being dragged backward on the return motion of lever 15 a retaining means in the form of a spring 18 (Fig. 3) is provided for engaging the pins 14. The lever 15 is pivoted at 19 and normally held in the position shown in Fig. 1 by spring 20. The magnets 16 oscillate the lever 15 from this position to the dotted line position thus causing one-eighth of a rotation of drum 9 for each operation of the magnets.

The magnets 16 are in a circuit shown in Fig. 1. One wire 21 of this circuit leads from switch 22 connected with the line 23, to the branches 24 and 25 connected with the electro-magnets 16, the return wires from these magnets being indicated at 26 and 27. The lamp circuit is made through lever 15 when in the dotted line position. This lever by connecting contacts 29 and 30 allows current to flow from conductor 25 to conductor 31 leading to the lamp. The return conductor for the lamps is indicated at 32. The switch 22 is provided between the conductor 21 and the line wire 23 so that the circuit for the magnets may be opened at this point and if desired the lamp circuit may be closed by throwing the switch 22 over to the contact 28. In this position of the switch, the signal remains illuminated but its colors do not change since the drum 9 remains stationary. Ordinarily in the normal operation of the signal, while the drum is rotating, the lamps are illuminated when the drum is at rest since at this time the lever 15 engages contacts 29 and 30.

The line conductors 23 and 33 respectively lead to any number of signals arranged in parallel across the line as indicated at 23′ and 33′ in Fig. 1. Any number of signalling devices may be controlled to operate in unison by means of a commutator construction such as shown in Fig. 2.

The common control means or commutator for a group of signalling devices consists of a motor driven cylinder 40. The motor for driving this cylinder is indicated at 41 and drives the cylinder at a slow rate through worm gearing 42. The current for supplying the line conductors 23 and 33 for operating all of a group of signals is supplied through a conductor 43, switch 44, conductor 45, brush 46 engaging the edge of the commutator and from the commutator the current flows through the adjustable brush 47 to the conductor 23. Current returns from the conductor 33 through the conductor 48 and switch 44, to the return conductor 49. The motor 41 is under the control of a switch 50 arranged as shown in Fig. 2 so that the motor circuit may be opened without interfering with the flow of current through the commutator in order that the signal lamps may remain lighted when it is not desired to have the signal drums rotated to change the color of the signal. In the normal operation of the commutator when it is constantly driven by the motor the flow of current to the signalling devices is interrupted at the required times by insulator inserts 51, which are arranged in annular rows around the commutator. The brush 47 is adjustable along its supporting rod 52 so that it may be set to cooperate with any one row of insulators. These are arranged differently as indicated at Fig. 4 so that the relative periods at which red, green and amber signals are displayed may be changed as desired.

Should it be desired to permanently display red in one direction without interfering with the normal signal arrangement for different directions, this may be done by using red colored translucent windows 53 located above the lense 13 as shown in Fig. 3. The windows 53 are normally covered by a plate 54 having a single aperture 55 for normally registering with lense 13 but the plate 54 may be swung on its fastening pivot 56 so that the opening 55 registers with the window 53 and the lense 13 is covered. Mirrors 57 reflect the light through windows 53.

In the operation of the signalling device motor 41 is normally constantly driven and current flows through the commutator 40 to all of the signalling devices connected therewith. When the brush 47 disengages an insulator 51 and makes contact with the commutator surface, current flow through the brush to the conductor 23 and from it to the magnets 16 causing the lever 15 to move from full-line position to the dotted line position as shown in Fig. 1. This causes the drum member to be rotated one step. The lamps of the signalling devices are also illuminated when the lever 15 comes into contact with the contacts 29 and 30, in the lamp circuits. The lamp remains illuminated until another insulator 51 comes below the brush 47, when the commutator lever 15 is released and swings back to the full-line position (Fig. 1) under the action of spring 20. This action is regularly repeated at intervals according to the number and setting of the insulators 51 with respect to brush 47.

The colored windows 12 carried by the drum 9 are arranged so that while red is shown through one pair of lenses 13 green is shown through the remaining pair of lenses. Next amber shows at all of the lenses. All of these colors are shown through one set of lenses 13.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A signalling device of the class described comprising a housing provided with a plurality of lenses each facing in a different direction, illuminating means within said housing, a drum in said housing comprising differently colored translucent members, means for displaying differently colored lights at said lenses to give different traffic signals, translucent colored windows in said housing for giving a stop signal, one near each of said lenses, and a cover for each of said windows, said covers being mounted to

be movable from said windows across said lenses.

2. A signalling device of the class described comprising a housing provided with a plurality of lenses each facing in a different direction, illuminating means within said housing, a drum rotatably mounted in said housing comprising differently colored translucent members for displaying differently colored lights at said lenses to give different traffic signals, translucent colored windows in said housing to give a stop signal, one for each of said lenses, a cover for each of said windows, said covers being mounted to be movable from said windows across said lenses, and means within said housing for reflecting light from the illuminating means through said translucent colored windows.

3. In a signal device of the class described, comprising a housing having a pair of apertures in each side thereof, a drum rotatably mounted in said housing comprising a plurality of differently colored transparent plates arranged to register with one aperture of each side of said housing, and having spaced apertures therein arranged to register with the other aperture of each side of said housing, windows of a uniform color in said last-mentioned apertures, illuminating means in said housing, means for rotating said screen for projecting differently colored light rays through one aperture of each side of said housing successively to give different traffic signals, and for intermittently projecting light rays of a single color through the other aperture on each side to give a stop signal, and an adjustable cover on each side of said housing for alternatively concealing the light rays projected through one of the apertures thereof.

Signed at Chicago this 12th day of March, 1928.

OTTO E. JOHNSON.