June 10, 1941. C. W. CAMPBELL 2,244,675

TRAFFIC CONTROL SIGNAL

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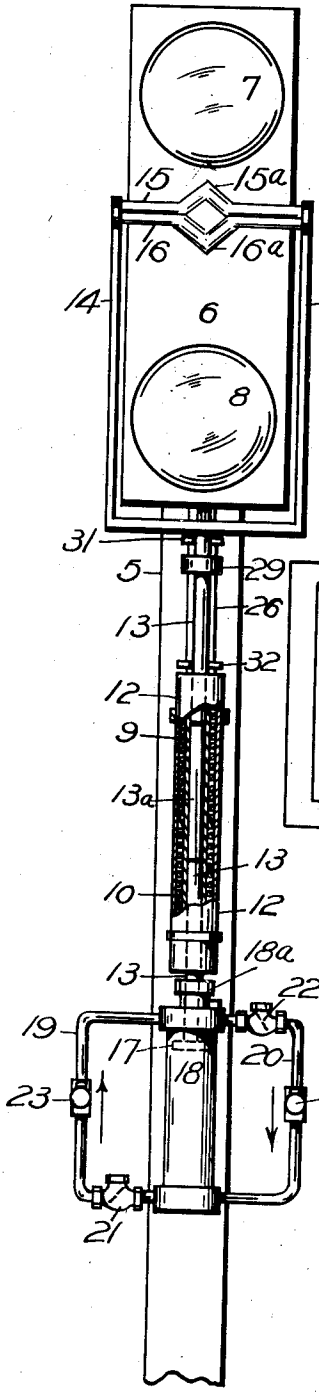


Fig. 1.

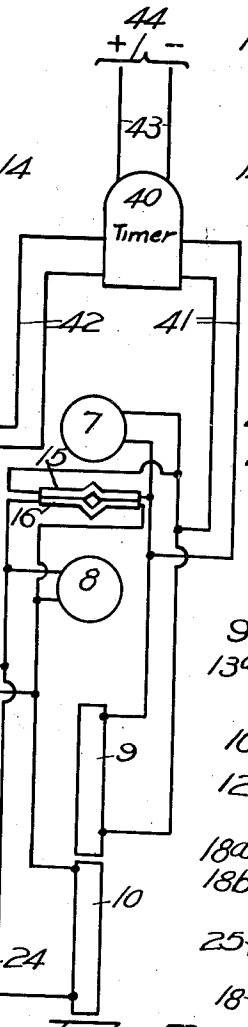


Fig. 3.

Fig. 2.

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TRAFFIC CONTROL SIGNAL

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3 Claims. (Cl. 177—337)

This invention relates to improvements in traffic control signals.

At street or highway intersections, that are provided with traffic control signals, pedestrians or motorists are often in the intersection when the signals change. A pedestrian may thus be trapped in a dangerous position or a motorist may have to back out of the intersection to avoid an accident. In any case, confusion and danger may attend a sudden change of traffic signals at busy intersections.

It is an object of this invention to provide a traffic signal that shows the approximate proportion of the time period that has elapsed since the last signal change and the approximate proportion of the period that remains before the next signal change will occur.

Another object of the invention is the provision of such a signal that can be installed to cooperate with previously established signals.

A further object is to provide such a signal that readily can be timed to suit traffic conditions.

A still further object is the provision of a movable traffic signal that may indicate a different time period from that indicated by an alternately changed stationary signal, with which it cooperates.

Other objects and advantages reside in the details of design and construction that will be disclosed more fully in the following description and in the drawing wherein like parts are similarly designated and in which;

Figure 1 is a front elevation, partly in section, showing a traffic signal that embodies this invention;

Figure 2 is a side elevation of the same; and

Figure 3 is a diagrammatic view of wiring circuits that are well adapted to be used with the signal shown in Figures 1 and 2.

In the drawing, reference character 5 denotes a pole or standard that supports a stationary light housing 6 having the usual traffic lamps, 7 that is red and 8 that is green.

Attached to the standard 5 are two solenoid coils 9 and 10 respectively, that are positioned end to end and that may be housed in a common cylindrical jacket 12. A rod 13 is slidably positioned through the solenoid coils, and has an iron magnetic core section 13*a*, in the magnetic field of the coils, the other parts of the rod being of non-magnetic material such as brass or aluminum.

At the upper end of the rod 13 is a frame 14, that carries an indicative element such as a pair of neon-type luminous tubes, 15 red, and 16 green, that are positioned across the light housing 6. Each luminous tube is provided with a point 15*a* and 16*a*, respectively, to indicate the direction of its movement when illuminated.

The lower end of rod 13 carries a double acting piston 17 that fits in a closed cylinder 18 that is filled, through a plug 18*b*, with a liquid such as thin oil, and which is provided with a packing gland 18*a* around the rod 13 and with two piston by-pass conduits 19 and 20 respectively. The by-pass 19 is provided with a check valve 21 to pass liquid only in an upward direction and the by-pass 20 is provided with a check valve 22 to pass liquid only in a downward direction. Each by-pass is provided with a valve 23 and 24 respectively, so that the flow of liquid therethrough may be optionally restricted, spring clips 25 serving to retain the valves in a selected position and degree of opening.

Adjacent the solenoid assembly and preferably parallel thereto, is a tube 26 that carries a pulley 27 at its upper end, over which passes a cord 28 that is attached at one of its ends to the rod 13 by means of a collar 29 and at its other end to a counterweight 30 that is freely suspended thereby in the tube 26.

A stop 31 is adjustably attached to the tube 26 to engage the collar 29 on the rod 13, in its upward movement, and a second stop 32 is positioned to engage the collar in its downward movement.

Operation

In operation, a time clock-switch 40, Figure 3, alternately connects circuits 41 and 42 with a power supply circuit 43 inclusive of a source of energy 44, to alternately illuminate the stationary red traffic lamp 7 and the similar green traffic lamp 8, as is the conventional custom.

The upper solenoid 9, is connected with the red light circuit 41, as is also the red neon-type tube 15, so that all are energized simultaneously. This acts upon the magnetic core section, 13*a*, of the rod 13 to raise the rod and its associated assembly, the speed and time of the upward movement being governed by the degree of opening of the valve 24 in the by-pass 20. This upward movement continues until the collar 29, on the rod 13, is engaged by the stop 31 which, normally is synchronized to be at a point where the red light tube 15 coincides in position with the edge of the main red light 7, and at a time when the time clock-switch is about to energize the circuit 42 to, in turn, energize the lower solenoid 10, the green lamp 8 and the green tube light 16. Whereupon the rod 13 and its assembly reverses its direction of travel and starts downward, the speed of travel and the time required to complete the down stroke, to bring the collar 29 in contact with the stop 32, being governed, optionally, by the degree of the opening of the valve 23 in the by-pass 19. The arrival of the assembly at the downward limit of its movement, normally, will be at about the time the red light circuit is again energized, to again start the assembly upward to repeat the cycle. The counter-

weight 30 relieves the mechanism of raising dead weight, so that the work involved is principally the overcoming of friction in the various component parts.

By this arrangement, a signal is provided that may be installed on, and connected with, previously established electrical signals that are commonly provided with a conventional stationary red lamp and a stationary green lamp and a time clock-switch to alternately energize and illuminate the lamps.

The travel and position of the movable neon-type tube lamps will approximately indicate the proportion of time that has elapsed since the last signal change and the proportion of time that remains before the signal will again change.

The synchronization of the travel of the light tubes, with the change of the stationary lights, is readily accomplished by the setting of the control valves 23 and 24, which have been illustrated as out in the open for clarity, but which would preferably be housed under lock and key to prevent unauthorized tampering. The limits of travel of the movable signals can readily be fixed by the location of the stops 31 and 32. It may be preferred to have the red tube stop at the edge of the red light and the green tube stop at the edge of the green light or each tube could travel to approximately the center of its corresponding stationary light.

The timing can be arranged so that the light tubes will arrive at the limits of their travel at about the time of the light change, or the tube lights can be timed to reach the stationary lights a few seconds before the change of signals. In any arrangement, the public will soon learn to judge the situation upon arrival at an intersection of streets or highways, and thereby know whether to start across the intersection or to wait for the next change of signals.

The points 15*a* and 16*a* on the respective light tubes indicate the direction of their travel,, during their illumination, and call attention to the fact that when an illuminated tube light arrives at, or adjacent a stationary light of the same color, a change in lights, and the direction of traffic, is imminent. The colors "red" and "green" are herein referred to because of the accepted present practice in traffic lights, but the invention is not limited to any specific color or colors, or to any specific type, shape or size of moving or stationary lamp, light or signal.

At intersections where traffic in one direction is greater than traffic in another direction, the moving signals of this invention can be optionally timed to travel up and down at different rates of speed to indicate different time periods to traffic in different directions. Or at a wide intersection, a warning to wait for the next favorable light may occur earlier in the period or cycle than would be necessary for a narrower street.

The movable signals and their actuating and governing mechanism, that, in combination with stationary signals, are the subject of this invention, can be built into original traffic control systems or, as above pointed out, they can be installed to cooperate with previously established stationary signal equipment. Where it is preferred to have the different lights in horizontal spaced relation to each other, the movable signals and their actuating mechanism can be arranged to operate in a horizontal cycle of movement. or at any desired angle. Any convenient means may be used to support the signals other than the standard shown.

The invention resides in the broad idea of a moving signal element that reciprocates between stationary signals and actuating mechanism capable of independent selective timing of the moving signal in both directions of its travel.

As above pointed out, the arrival of a moving signal at or adjacent a stationary signal toward which it is traveling, indicates that a change in signals and in the direction of traffic, is about to occur. In case a clearing of traffic in one direction, prior to the starting of traffic in another direction is desired, the green or favorable moving signal can be timed to arrive and stop at the corresponding stationary signal, for any desired definite period of time before traffic in another direction is signalled to start. Thus, wide or dangerous intersections readily can be cleared of traffic prior to a signal change, the actual time during which traffic may go, being limited to the period of actual travel of the favorable moving signal. But the travel of the red or danger signal can be so timed as to hold back traffic until the instant of change, to prevent dangerous "jumping" or beating the signals.

When the signals are not active, either the red stationary lamp or light, or the red movable lamp or light may be connected with a well known "flasher" to indicate caution in the usual and accepted manner.

Under certain conditions the moving signal may preferably be positioned to a side of the center line between the stationary signals or lamps. The term "between the stationary signals," as used in the appended claims, is intended in the broad sense of "from one toward another."

The fluid used in the cylinder 18 to selectively retard and regulate the movement of the mechanism, may be a light oil such as kerosene or a mixture of kerosene and heavier oil, or it may be a water-base fluid having glycerine or other ingredients to prevent freezing.

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

1. The combination with a signaling device inclusive of two stationary alternately illuminated signal lamps, of a timing signal mounted to move back and forth between the stationary lamps and having means to indicate the direction of its travel, and means to effect said movement of the timing signal.

2. The combination with a signaling device inclusive of two stationary alternately illuminated signal lamps, of a movable timing signal mounted to move back and forth between the stationary signals and having means to indicate the direction of its travel, means to effect said movement of the movable signal, and means to alternately illuminate the direction-indicating means.

3. A traffic signal comprising spaced alternately illuminated stationary lamps of different colors, an indicating element positioned for reciprocation away from one of said lamps and toward the other lamp, means for illuminating the indicating element in a color corresponding to the color of the lamp that is illuminated, the indicating element being completely exposed to view during its illumination, and means for reciprocating the indicating element during the alternate illuminations of the lamps.

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