Nov. 26, 1935. N. G. CAMPION 2,021,954

TRAFFIC SIGNAL

Filed March 23, 1932 3 Sheets-Sheet 1

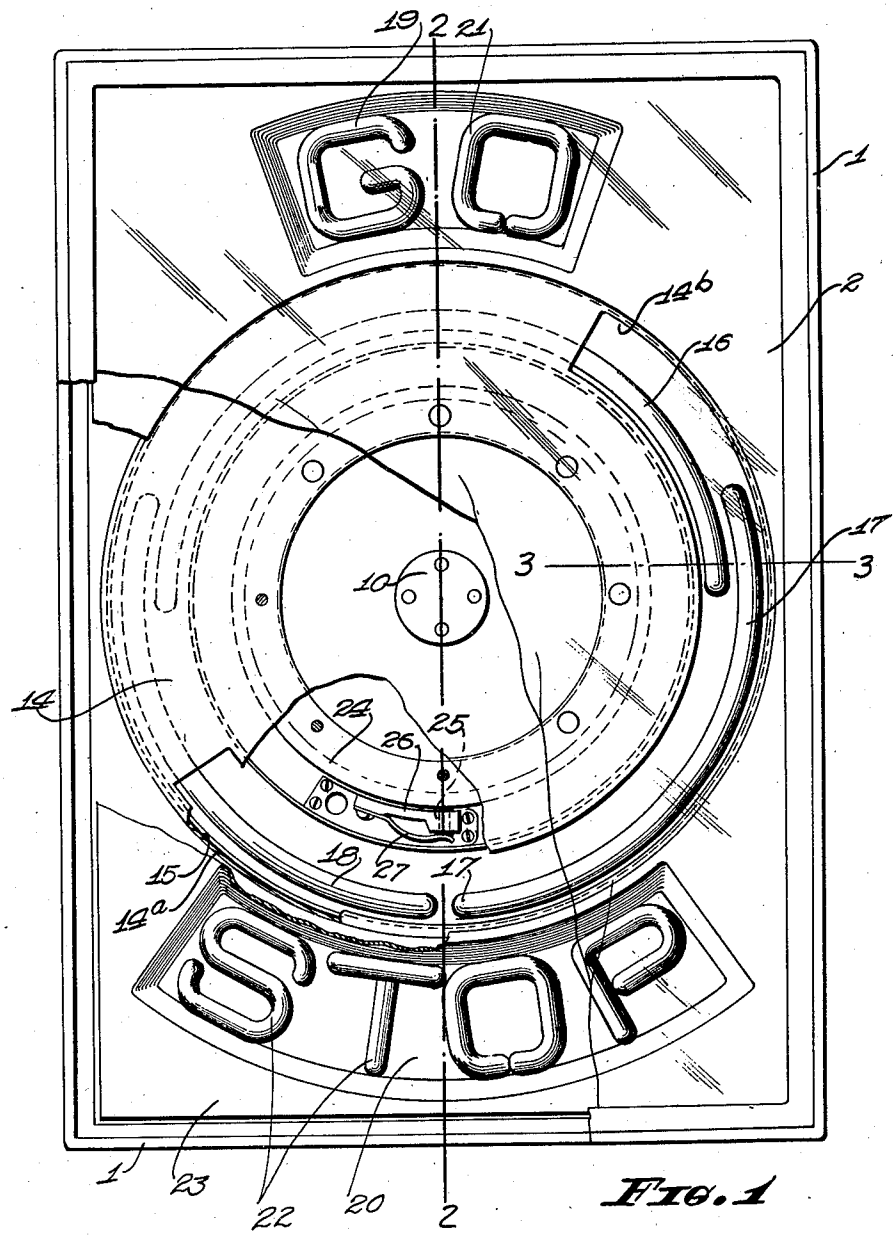

FIG. 1

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TRAFFIC SIGNAL

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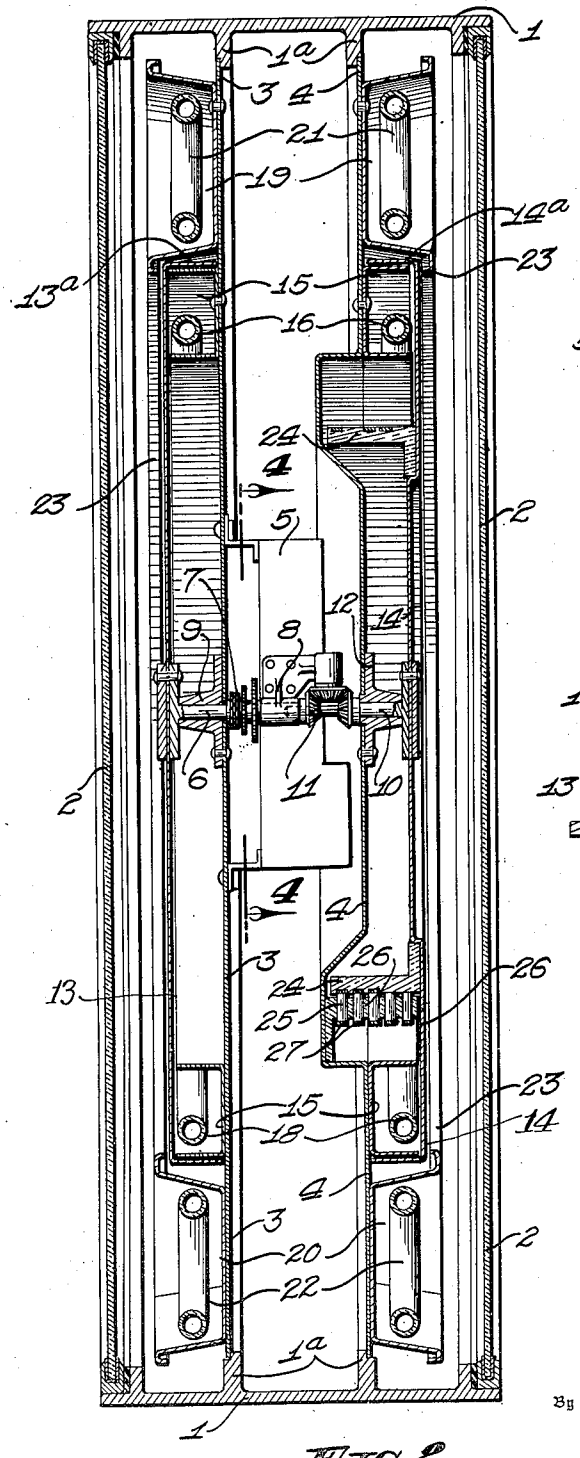

FIG. 2

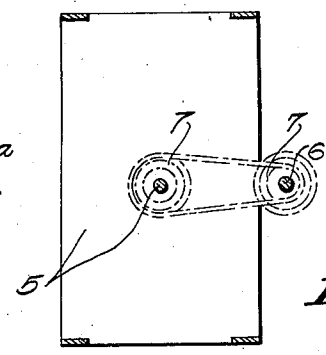

FIG. 4

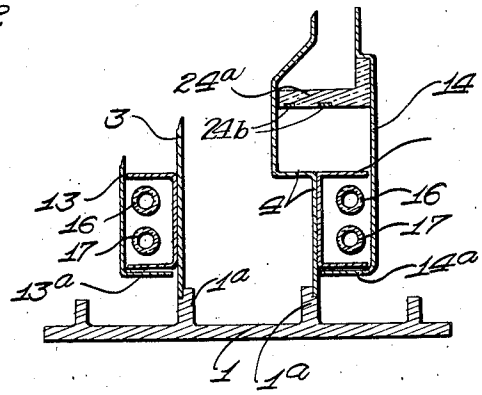

FIG. 3

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TRAFFIC SIGNAL

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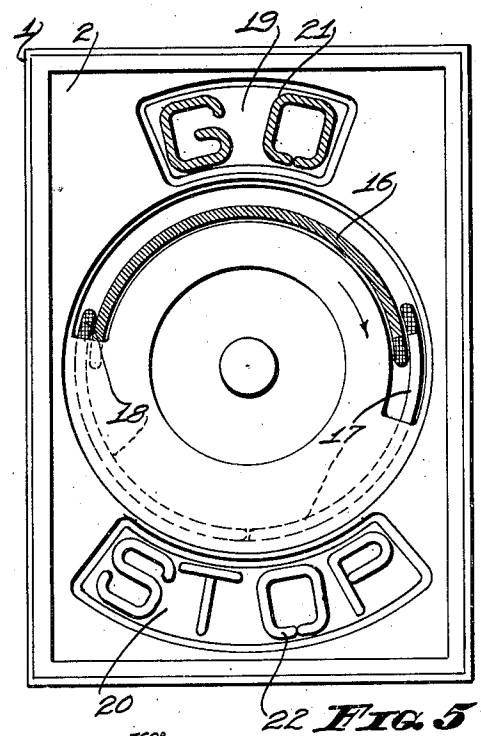

FIG. 5

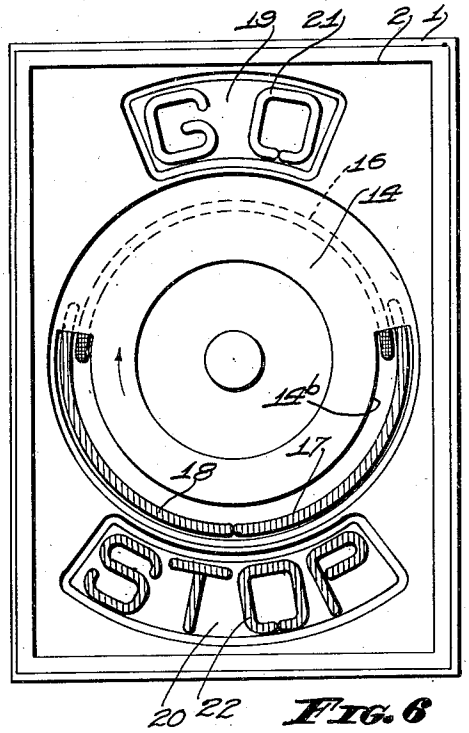

FIG. 6

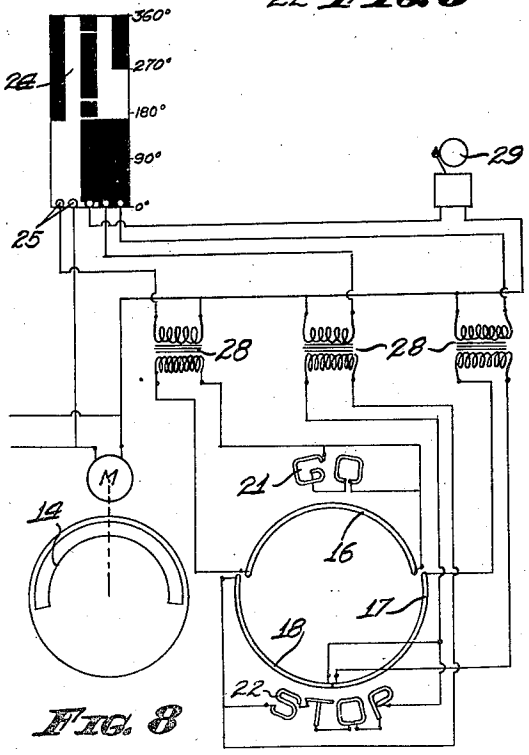

FIG. 8

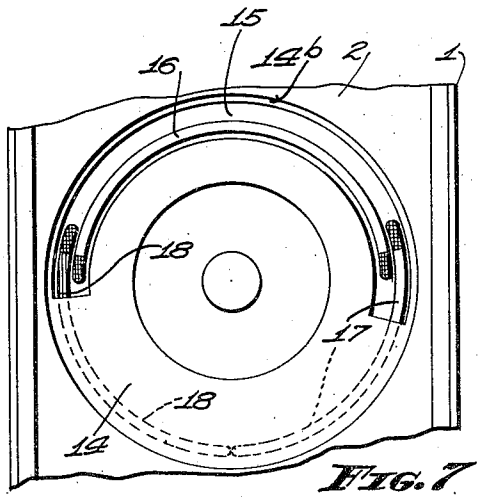

FIG. 7

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Patented Nov. 26, 1935 2,021,954

UNITED STATES PATENT OFFICE

2,021,954

TRAFFIC SIGNAL

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Application March 23, 1932, Serial No. 600,770

1 Claim. (Cl. 177—327)

My invention relates to traffic signals, and the objects of my invention are:

First, to provide a traffic signal which graphically indicates the length of time remaining before the signals change;

Second, to provide a traffic signal which is driven by a synchronous electric clock mechanism whereby the signal may be attached to the nearest power line thereby eliminating the necessity of installing special wiring or a special wiring system for control of the signals;

Third, to provide a traffic signal which is particularly economical of operation in that an inappreciable amount of power is required to operate the moving parts thereof;

Fourth, to provide a traffic signal which may be installed quickly, easily and economically by reason of the elimination of a wiring system connecting the signals of the four corners of an intersection or the corners of adjacent intersections, thereby providing a traffic signal which is particularly suited for outlying independent intersections, that is intersections which need not be controlled in any particular relation with other corners or intersections provided with signals;

Fifth, to provide a traffic signal which although suited for outlying installation is also adapted for group installation inasmuch as the synchronous motors driving the several signal units may be initially set in their proper sequential order and thereafter be maintained in such order by reason of their association with their common source of current supply;

Sixth, to provide a traffic signal which is visible from a great distance, and

Seventh, to provide on the whole a novelly constructed traffic signal which is simple of construction, durable, efficient in its action, and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claim, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is an elevational view of my novel traffic signal with parts and portions broken away and in section to facilitate the illustration; Fig. 2 is an enlarged longitudinal sectional view through 2—2 of Fig. 1 with parts and portions shown in elevation to facilitate the illustration; Fig. 3 is a fragmentary transverse sectional view through 3—3 of Fig. 1; Fig. 4 is a fragmentary sectional view through 4—4 of Fig. 2; Fig. 5 is a reduced substantially diagrammatical elevational view of the traffic signal showing the various elements as they appear when the traffic signal indicates "Go"; Fig. 6 is a similar view when the traffic signal indicates "Stop"; Fig. 7 is a fragmentary view similar to Figs. 5 and 6 when the signal is about to change from "Stop" to "Go", and Fig. 8 is a wiring diagram of one unit of my novel traffic signal.

It will be here noted that the drawing of the wiring is only schematic and in practice the usual expedient for parallel operation should be used or the tubes connected in series.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

Casing 1, doors 2, panels 3 and 4, electric clock mechanism 5, shutter shaft 6, variable speed driving means 7, shutter shaft bearings 8 and 9, shutter shaft 10, reversing gears 11, shutter shaft bearing 12, shutters 13 and 14, ring pans 15, time warning tubes 16, 17 and 18, indicia pans 19 and 20, gas tubes indicating "Go" 21, gas tubes indicating "Stop" 22, face plates 23, contact drum 24, contact riders 25, supporting bracket 26, tension springs 27, transformers 28, and audible signal 29, constitute the principal parts and portions of my novel traffic signal.

A casing 1 is provided which may be in the form of a rectangular frame open at its opposite sides. These sides may be equipped with doors 2 having glass portions. Inwardly from each open side the casing 1 is provided with supporting ridges 1a which support the margins of panels 3 and 4.

The panel 3 supports adjacent its central portion an electric clock 5. The electric clock 5 is connected to a shutter shaft 6 by means of a variable speed driving means 7 of any suitable nature. The shutter shaft is supported in a bearing 8 secured to a side of the clock mechanism and in a bearing 9 supported by the panel 3, the shutter shaft 6 extending through the panel 3 and bearing 9. A second shutter shaft 10 is provided which may be disposed in concentric relation with the shutter shaft 6. An end of the shutter shaft 10 may journal in an end of the shutter shaft 6 and be driven from the shutter shaft 6 by means of reversing gears 11, one gear being on the shaft 6, another gear on the shaft 10, and a third gear connecting them

so that the shaft 10 revolves in the opposite direction to the shaft 6. The extended end of the shaft 10 projects through the panel 4 and journals in a bearing 12.

Secured to the ends of the shutter shafts 6 and 10, respectively, are shutters 13 and 14. The shutters are spaced from their respective panels and are annular. Their peripheries are provided with inturned rims 13*a* and 14*a*, respectively, which project towards their respective panels 3 and 4. Mounted on the panels 3 and 4 underneath the peripherial portions of the shutters 13 and 14 are ring pans 15. These pans are in the form of channel members bent to form a circle. Mounted in the ring pans 15 by any conventional means are time warning tubes 16, 17, and 18, these members being constructed from the conventional illuminable gas tubes. The warning tubes 16 are approximately semi-circular and are disposed adjacent the inner, that is the radially inner, walls of the ring pans 15 and occupy the upper half of these pans. The tubes 16 coact with the "Go" signalling portion of the traffic signal which will be described hereinafter.

The warning tubes 17 and 18 coact with the "Stop" signalling portion of the traffic signal. The warning tubes 17 and 18 are arranged in concentric relation with the warning tubes 16 but are disposed radially outwardly therefrom so that they may overlap the warning tubes 16. At a point diametrically opposite the central portion of the corresponding warning tube 16, the one ends of the tubes 17 and 18 are arranged in abutting relation. The remaining extremities of the tubes 17 and 18 overlap the extremities of the corresponding tube 16 a short distance. By painting out the extremities of the tubes 16, 17 and 18 the illuminable extent of these tubes may be varied thereby varying the percent of the circle occupied by the several tubes.

The marginal portions of the shutters 13 and 14 are provided with arcuate slots 13*b* and 14*b*, respectively, which register with the ring pans 15 and consequently expose the warning tubes 16, 17, and 18. The slots 13*b* and 14*b* extend the full extent of the warning tubes 17 and 18, the illuminated portions of which preferably occupy more than half a circle, in order to provide waiting periods in which the four traffic signals at a particular intersection indicate "Stop".

Mounted above and below the shutters 13 and 14 are indicia pans 19 and 20 which receive gas tubes indicating the word "Go", designated 21, and gas tubes indicating the word "Stop", designated 22, respectively. The indicia pans 19 and 20 may be formed integral with or set in face plates 23 which cover the pans between the shutters and margins of the casing.

Secured to one of the shutters, in the structure illustrated the shutter 14, is a contact drum 24 which is provided with insulated portions 24*a* and contact strips 24*b* which are engaged by contact riders 25 supported from a common bracket 26 and held in yieldable engagement with the contact drum by means of tension springs 27. Certain of the contact riders are connected to the primary coils of transformers 28. One of the contact riders 25 is electrically connected with an audible signal 29 while the remaining contact rider joins the drum with a source of current supply.

Operation of my traffic signal is as follows: The time warning tubes 16 and the "Go" indicating tubes 21 may be connected to the same transformer and are preferably colored green or blue. These tubes are illuminated when the trailing edge of corresponding slot 13*b* or 14*b* is about to pass over the warning tubes 16. This condition continues until the shutters have completely covered the warning tubes. In other words, the warning tubes and "Go" indicating tubes, 16 and 21 respectively, are illuminated while the shutters move from the position shown in Fig. 5 to the position shown in Fig. 6, whereupon the "Stop" indicating tubes 22 and warning tubes 17 and 18 become illuminated and continue so until the shutters have completely covered the warning tubes 17, whereupon these tubes are disconnected. In order to accomplish this, the tubes 17 are connected to a separate transformer. The warning tubes 18 and "Stop" indicating tubes 22 continue to be illuminated until the shutters reach the position shown in Fig. 5. By watching the warning tubes it is possible to determine the period remaining before the signal changes.

It will be noted that in place of the gas tubes ordinary electric light bulbs may be used over which are positioned glass plates having translucent or transparent portions arranged to form the desired words and the particular configuration of the time warning means.

It will also be noted that the slots 13*a* and 14*a* in the shutters may have an arcuate extent somewhat less than that of the "Go" warning tubes, in which case a single tube may replace each pair of tubes 17 and 18 forming the "Stop" warning and the operation is the same as that heretofore described. The trailing edge of the slots 13*b* and 14*b* and their position toward the end of the warning tubes indicate the time of change of signal.

It will also be noted that the clock mechanism need not be electrical or synchronous when the installation is at isolated intersections which do not require operation in any particular order or relation with other intersections.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claim.

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

In a traffic signal, a plurality of arcuate illuminable sign elements arranged to form a ring, the extremities of said sign elements overlapping arcuately, and adapted to emit contrastingly colored lights, means for operating said sign element in sequential order, a revoluble shutter disposed in front of said sign elements arranged to blot out and diminish the effective extent of each sign element during its period of operation, and means to cover and render ineffective portions of the arcuately overlapping extremities of said sign elements whereby the apparent arcuate extents of said sign elements may be variously determined.

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