April 25, 1933. H. J. GECHTER 1,905,378

TRAFFIC REGULATING DEVICE

Filed July 5, 1929 4 Sheets-Sheet 1

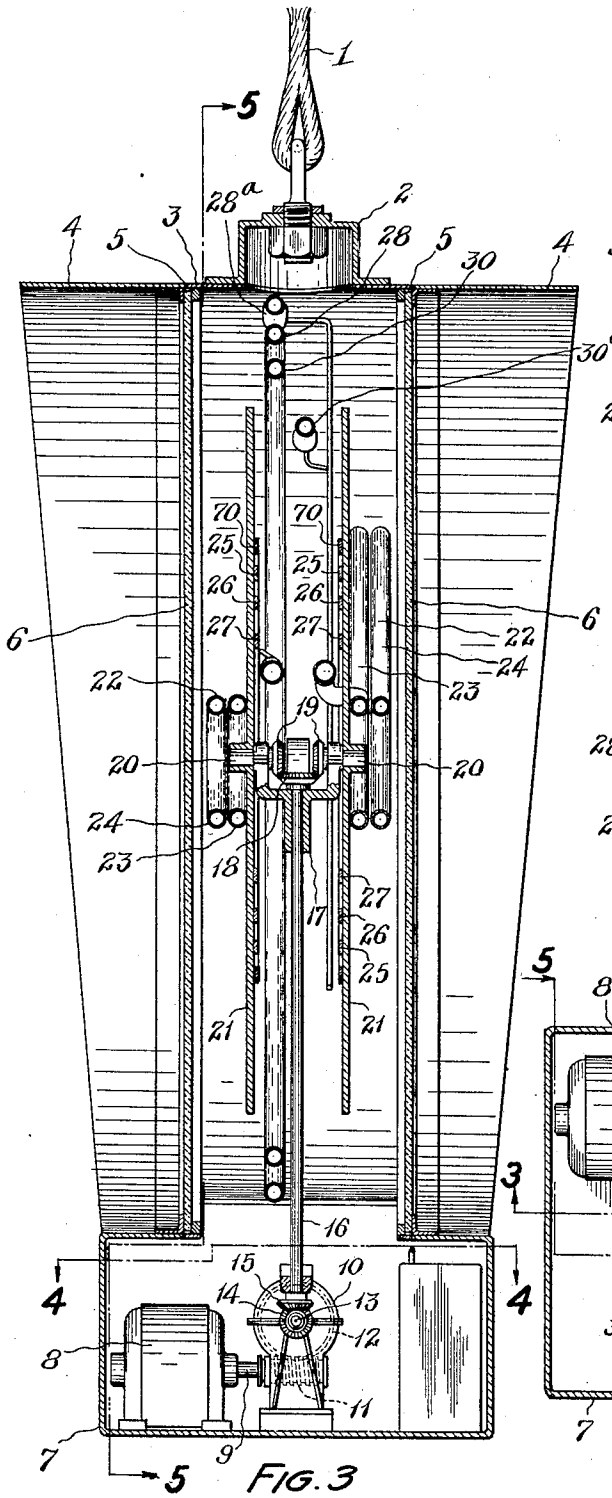


FIG. 3

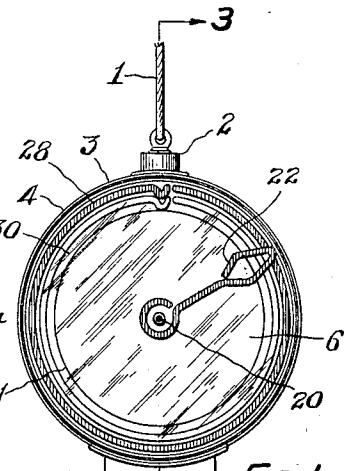


FIG. 1

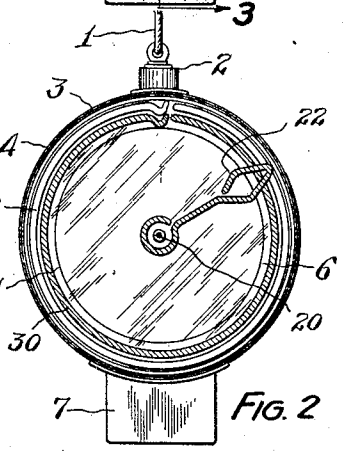


FIG. 2

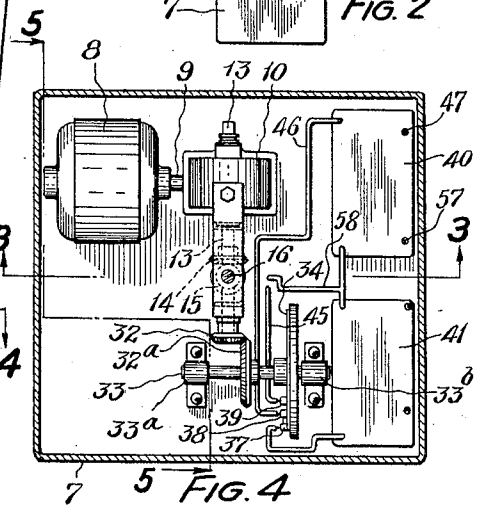


FIG. 4

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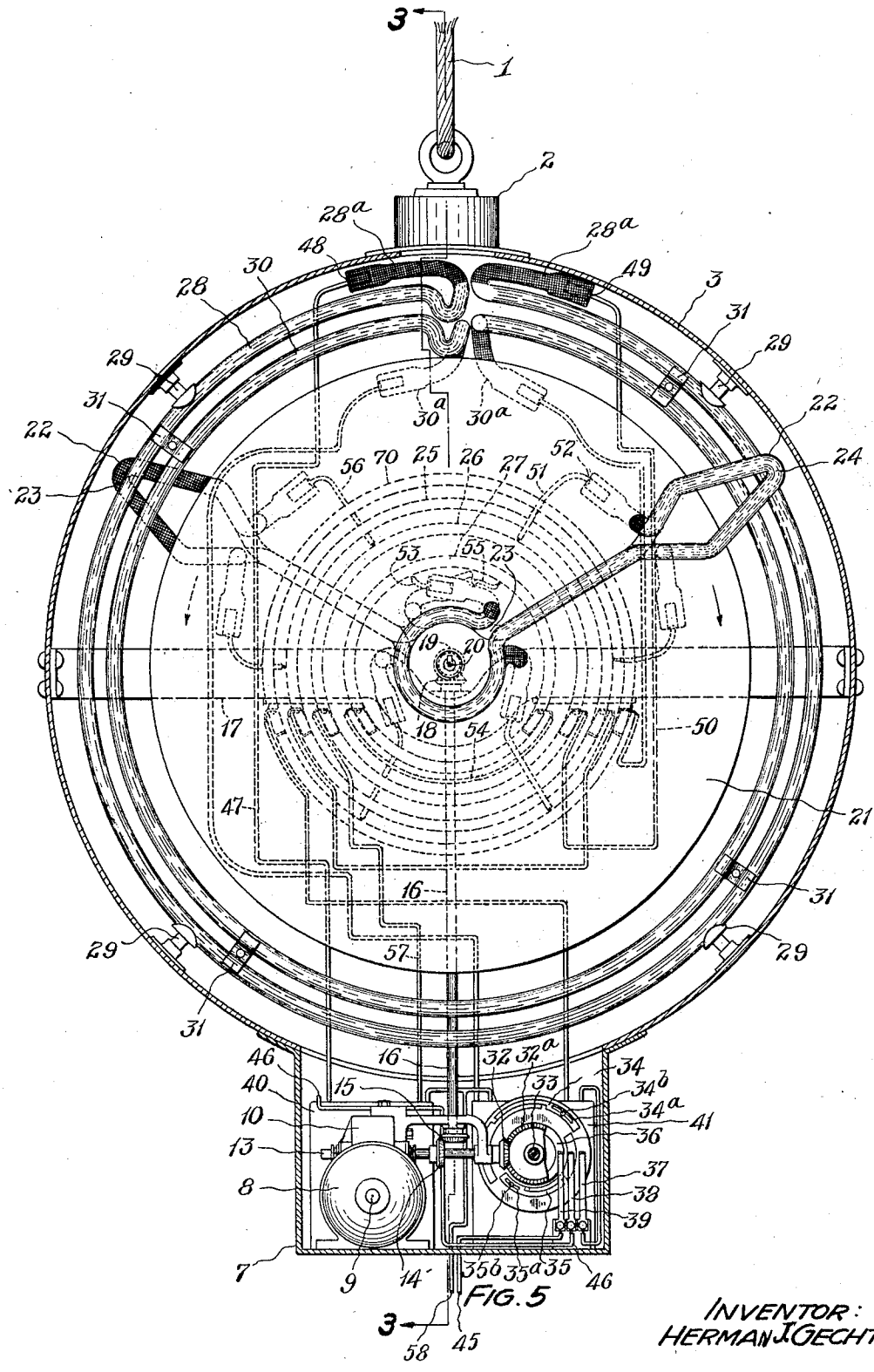


FIG. 5

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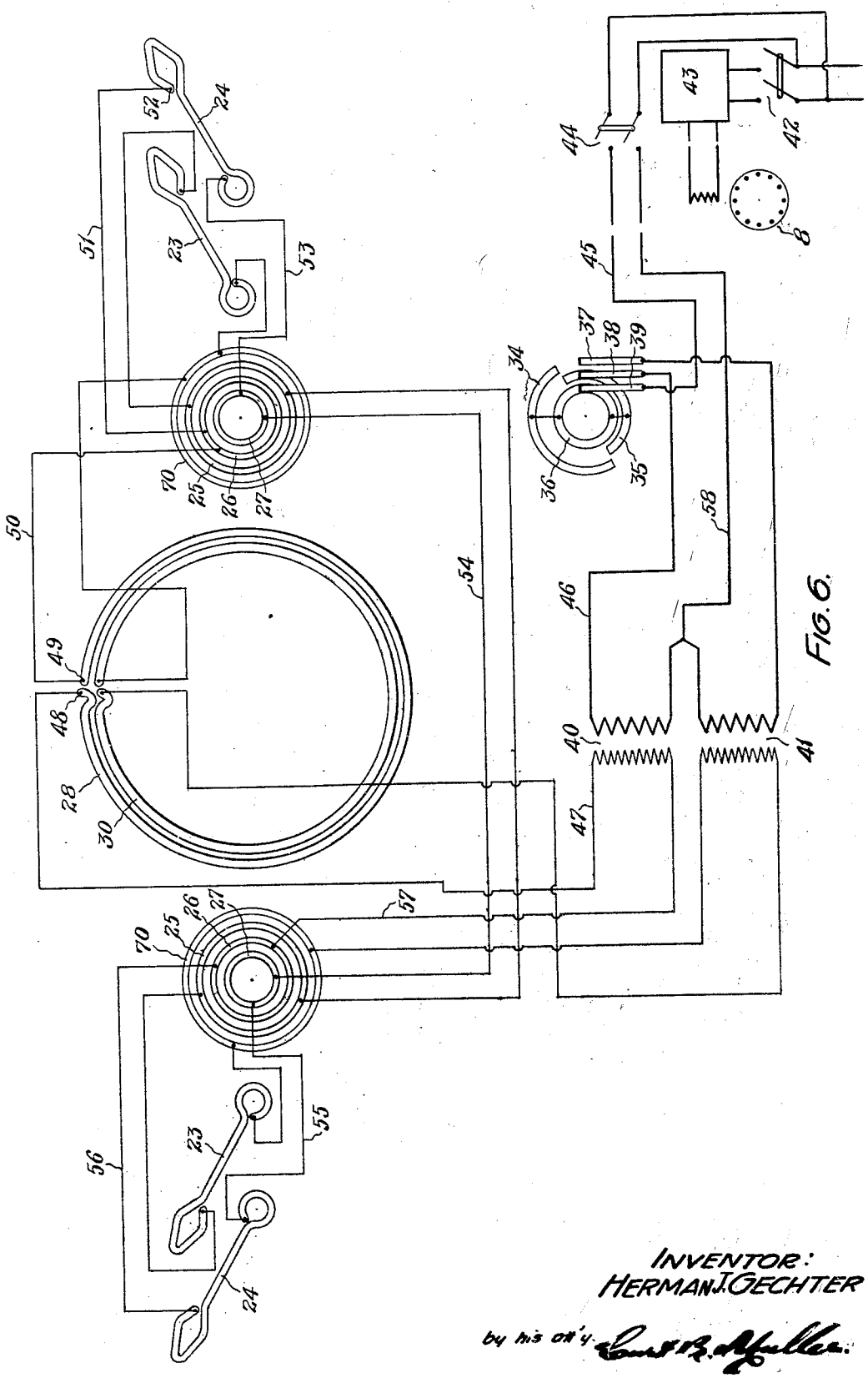


FIG. 6.

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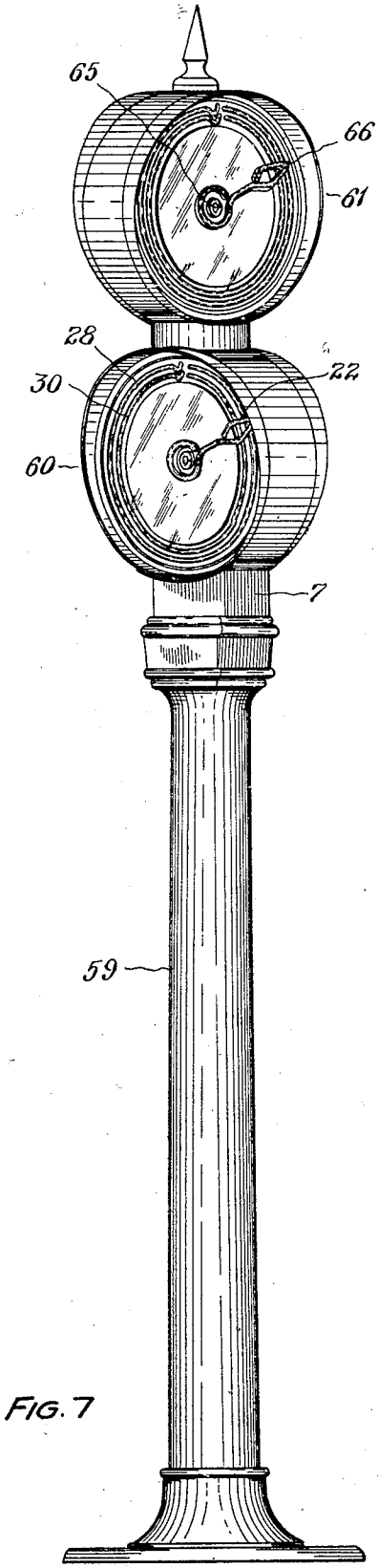


FIG. 7

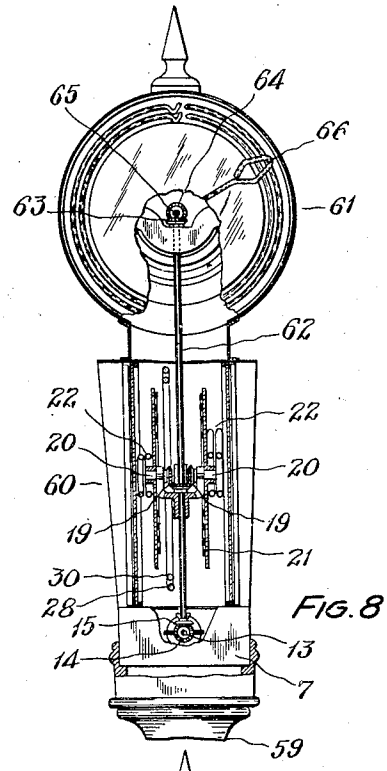


FIG. 8

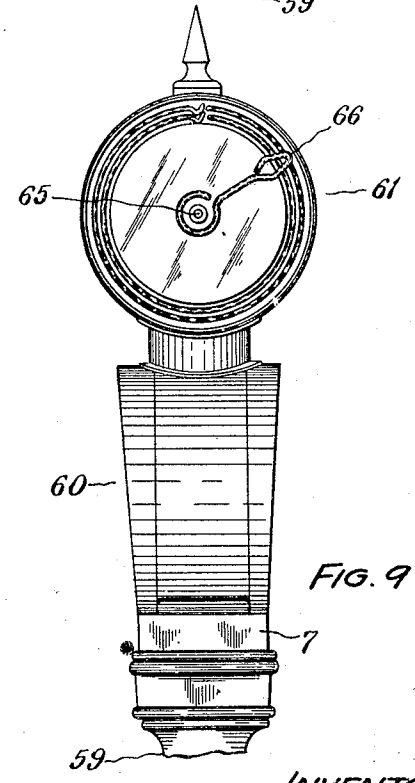


FIG. 9

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Patented Apr. 25, 1933 1,905,378

UNITED STATES PATENT OFFICE

HERMAN J. GECHTER, OF CLEVELAND, OHIO

TRAFFIC REGULATING DEVICE

Application filed July 5, 1929. Serial No. 375,937.

My invention pertains to a traffic regulating device and more particularly to an appliance of that character for visually indicating the determinable time remaining during which traffic may continue past it.

Traffic regulating lights have in the last years been developed to approach standardization by employing incandescent lamps in front of reflectors or by sending their light through colored glass lenses, thus attempting good visibility in bright day light, yet the need has continued for some simpler and more effective means to indicate different colors to drivers of vehicles, as well as to pedestrians, and furthermore to indicate the exact stage of progress in the changing cycle of red and green; the intermittent yellow becoming abandoned because an unsatisfactory attempt to fulfill the desire for reliability for safety. It would be helpful and reassuring for vehicle drivers when approaching a signal, especially on icy or slippery pavements, to know at all the times how soon the traffic regulating light will change. Likewise pedestrians would be consistently unhesitant and avoid recklessness in crossing streets if they could know whether there was adequate time remaining for them to cross safely.

Devices have been patented consisting of illuminated dials and a movable pointer to indicate approaching change, but never have been used to any great extent, supposedly because of their poor visibility or because various colors and indicators of change were not given effectively for long distances and under any weather conditions.

My invention is known to comply with the aforementioned requirements, i. e., remote visibility together with an illuminated indication of the stage of progress of changing cycles during bright day light as well as at night. I have realized that neon lights, or any other cold or hot cathode, gas filled illuminating lights, are not only seen very clearly at very long distances, but produce this result without the use of expensive reflectors and glass lenses. I discovered that movable and illuminated pointers of neon gas tubes on a dark field stand out especially sharply and clearly and their position is more accurately gaged at long distances and furthermore, that neon gas lights endure longer than ordinary incandescent lamps, hence do not have to be so often changed, and therefore minimize an interrupted traffic regulation. Incidentally, neon gas lights are much more economical in respect to current consumption and their initial cost becomes almost negligible, considering the savings incurred in comparison with the traffic signal lights now in common use.

Adverting to the drawings:

Figure 1 is a front elevation of a traffic regulating device embodying my invention showing illuminated the outer or red one of two concentric neon lights as well as the red pointer.

Figure 2 is a view corresponding to Figure 1 showing the inner or green glowing neon light and the green glowing pointer illuminated.

Figure 3 is a greatly enlarged section viewed on line 3—3 of Figure 1.

Figure 4 is a horizontal sectional view taken on line 4—4 of Figure 3 looking downwardly.

Figure 5 is a vertical sectional view on line 5—5 of Figure 3.

Figure 6 is a diagrammatic view of the wiring system.

Figure 7 is a perspective view of a modified duplex and pedestal type of device embodying my invention.

Figure 8 is a broken sectional view of portions of Figure 7 showing interior driving mechanism.

Figure 9 is an end view of the upper portion of Figure 7.

My improved traffic signal light consists of a case, within which and near its periphery, I install a concentric series of neon tubes, so that they may be seen easily by observers on opposite sides. Means are provided for illuminating one or the other of these tubes with different colored lights at predetermined intervals of time. Where weather conditions warrant more careful protection of the device, it may be enclosed partly or entirely with glass or other transparent material.

This concentric series of neon tubes preferably consists of two or three tubes. When two tubes are used, one of the tubes would preferably be red, or a color indicating "stop" when illuminated, while the other tube would be green or a color indicating "go" when illuminated. When three tubes are used, the third tube might be yellow or any color meaning "caution" when illuminated.

Mounted in the center of these neon gas tubes, which may be made either circular, as exemplified, or in any desired shape, such as hexagonal or octagonal, on a dark disc, is a pointer also consisting of neon gas tubes and means provided to rotate it at a predetermined speed, this pointer being associated with electrical contacts to provide for the changing of the pointer from one color to another. One of these composite pointers is provided for each side of this device.

As exemplified in Figures 1–3 my device may be appropriately hung at a street intersection by means of a cable 1 which is attached to a bracket 2 at the top of an annular frame 3 provided on each of two opposite sides with visors 4 and fashioned interiorly, in spaced relation on opposite sides of the bracket 2, with channels 5 for the reception of a pair of transparent glass discs 6. The discs 6 and channels for supporting them are an optional incorporation for protection against inclement weather.

Depending from a lower margin of the frame 3 is a compartment 7 within which is supported an electric motor 8, which may be subject to regulatory control at a street curbing or pole in the manner already common to the art and therefore not necessary of illustration. The motor shaft 9 enters a housing 10, as shown in Figures 3 and 4, and is therein provided with a worm 11 which meshes with a worm gear 12, which is fixed to a crosswise extending shaft 13 upon which is mounted a bevel pinion 14 meshing with its counterpart 15 secured to the lower end of a vertically extending shaft 16, located in the median plane of the frame 3 and having its upper end rotatable in a suitable bearing of a main central bearing support 17. The upper extremity of the shaft 16 carries a pinion 18 adapted simultaneously to rotate two spaced pinions 19 which are at the inner ends of two stub shafts 20 which are suitably mounted in horizontal bearings formed in the support 17. Fixed to outwardly projecting ends of shafts 20 are a pair of opaque plates 21.

Since the construction and arrangement of elements carried by each of the plates 21 are the duplicate of those carried by the other plate, there is no need for employing the plural number and accordingly the parts to by next described are to be considered as duplicated on each of the plates 21 and the singular number will be adopted in the description thereof. A pointer 22 projects radially in front of the disc 21 and carries adjacent to the disc 21 a neon or other illuminable gas tube 23 which is adapted to glow green in color and also carries outwardly adjacent to the tube 23 another neon tube 24 which is adapted to glow red in color. The tubes 23 and 24 are all of like shape and size and approximately conform to the conventional shape of the hand of the clock. It is also worthy of mention that the outermost or red-glowing tube 24 on the pointer 22 will be extinguished just before the green-glowing tube there behind becomes in turn illuminated and that the radiance from the tube 23 is readily transmitted through the tube 24. The inner or opposite side of the plate 21 carries four concentric contact rings of which the outer one has been designated by the numeral 70, the next one by the numeral 25, the next one by the numeral 26 and the inner one by the numeral 27 and it is to be understood that these rings functionate in pairs for the red and green circuits, the two inner ones 26 and 27 serving for the red circuit and the two outer ones 70 and 25 alternately functioning in unison for the green circuit in the conduction of electric current, as will hereinafter be described.

A circular neon tube 28 adapted to glow red is of somewhat smaller diameter than the diameter of the frame 3 and is attached thereto by four circumferentially arranged resilient insulating supports or clamps 29 which are suitably affixed to the inner annular surface of the frame. The two ends 28*a* of the tube 28 are doubled back at the top of the device, but blackened so as to be opaque, as shown in Figure 5. Inwardly concentric with the glass tube 28 is another green-glowing neon tube 30 provided with inwardly projecting opaque ends 30*a*. The glass tube 30 is clamped to the tube 28 by a series of four circumferentially arranged resilient insulating clips 31. The two pairs of opaque ends 28*a* and 30*a* of the tubes 28 and 30 are electrically connected with other units, as will be hereinafter described. It is interpolated that it is likewise optional with any municipality to dispense with the two circular tubes 28 and 30 out of consideration of economy, in which case the opaque plates 21 should continue outwardly to meet the frame to divide it as a partition.

Directing attention to Figures 4 and 5, it will there be observed that the shaft 13 continues across and passed the axis of the shaft 16 and is provided on its opposite end with another beveled pinion 32 which meshes with a beveled gear 32*a* on a transverse shaft 33 which is suitably mounted in the bearings 33*a* and 33*b*, which appear to view in Figure 4. Carried by, so as to turn with, the shaft 33 (see Figures 4 and 5) are: an outer elec-

trical segmental contact 34 which is circularly expansible or contractible by means of the common expedient of a segmental slot 34*a* and intersecting set screw 34*b*, also an inner electrical segmental contact 35 disposed diametrically opposite and likewise adjustable by means of a slot 35*a* and slot-intersecting screw 35*b*. The segment 34 will functionate for the green light circuit and the segment 35 for the red light circuits. An innermost ring 36 is likewise adapted to turn with the shaft 33 and to constitute an electrical common either for the green circuit or for the red circuits. Inspection of Figures 5 and 6 will disclose three brushes 37, 38 and 39 which are adapted to have rubbing contact with the segment 34, segment 35 and neutral ring 36 respectively. The rubbing contact of the brushes 37 and 38 will be intermittent and alternate, each with respect to the functionating of the other, whereas the rubbing contact of the brush 39 with the ring 36 is necessarily continuous. As will be readily understood, the adjustability (expansion or contraction) of the segments 34 and 35 permits of selectively lengthening or shortening the time periods of illumination of the green and red circuits for purposes of adjustment when the signal unit is installed. The current of the electrical system is to be stepped up from a low potential through a pair of transformers 40 and 41 to a high potential preparatory to energizing the several neon tubes. The transformers 40 and 41 are shown electrically connected in Figures 4 and 6 and may be considered as purposed, the former for the red glowing circuits and the latter for the green glowing circuits.

Attention is now invited to the diagrammatic illustration of Figure 6, where is shown a main cutout switch 42 which when closed will permit current to flow to each, a motor control 43 and an auxiliary switch 44. The control 43 enables the single phase motor to be controlled as to speed or cutout independently, as for instance when it might be desired to leave the red tubes glowing for a longer period in case of such an emergency as a fire and the attendant privilege of having street intersections cleared for unimpeded passage of the fire department vehicles. As is evident by the inspection of Figure 6, the switch controls the supply of current to the electrically operated parts of my traffic device. Assuming the switch 44 to be closed the flow of current may be so traced along a lead 45, to the common brush 39, through the common 36, thence to the red-controlling segment 35, through the brush 38 and along the wire 46 to and through the transformer 40, out along a wire 47 to one end 48 of the outer "red" neon tube 28, around it to its outer end 49, thence along a wire 50 to one of the two rings 26 to continue along the wire 51 which is connected with the outer end 52 of one of the tubes 24, through it and out along a wire 52 which is connected with one of the inner rings 27 and from it along a wire 54, which leads to the opposite inner ring 27, thence partially along it to a wire 55 connected with the central end of the other red tube 24, through it, out along the wire 56 to the opposite one of the rings 26, from it along the wire 57 to the transformer 40 and from it back to the switch 44 along the wire 58. It is manifest that the green circuit may be similarly traced if the green segment 34, instead of the red segment 35, had been in Figure 6 illustrated to be in contact with its particular brush, the green-glowing circuit thereby closed. It is to be observed also that the color to be shown will change for each half revolution of the shaft 33 with which the segments 34 and 35 turn, because the four ends of the segments 34 and 35 happen to be shown determinants of a diametrical line. It will be readily perceived that the lengthening of the segment 34 and corresponding shortening of the segment 35 will cause the green lights to show a longer period of time.

Figures 7, 8 and 9 pertain to a modified form of my invention mounted on a pedestal 59 which supports two duplex indicating devices 60 and 61 in superposed position and facing in relative transverse directions. The length of either segment may be altered in inverse proportion to the alterable speed of rotation of the pointer. With such an arrangement a longer shaft 62 is substituted for the shaft 16 so that it is continuant upward'y beyond the two spaced pinions 19 between which it passes to be provided at its top, just below the center of the device 61, with a second pinion 63 for driving a pair of beveled gears 64, similar to the gear 19, only one of the gears 64 being shown in Figure 8, on crosswise extending shafts 65 which carry at their two opposite ends pointers 66, each of which will be turned in a clockwise direction, as possible of being viewed when the device is assembled for use.

These changes may be made simultaneously with corresponding changes in color of the concentric neon gas tubes, so that, for instance, during the time when the tubes show red light, the pointers would make a comp'ete revolution (360°) like a clock hand, showing the same red color. When reaching the zenith, the pointers, as well as the tubes, may both be changed from red to green, or to any other desired color.

It will be evident that three or any number of indicating devices, greater than two may be superposed, for those cases where traffic is to be directed in more than two directions to achieve cyclical switch of color.

Numerous alterations in the timing of the different functions of this apparatus are possible. For instance, in some cases, it may

be desirable to change the color of the pointer from green to red or amber or any other desirable color, before it reaches the zenith position, as an indication to pedestrians that it is too late to start to cross the thorofare. The operation may also be arranged to stop all pointers when they reach the zenith position and turn red and also, to turn all concentric tubes red, to stop all traffic for a few seconds in order to provide time to clear the intersection. These are only a few of the modifications which may be made in the operation and timing of this device and it will be very evident, that this invention is adapted to a wide range of modifications hence very flexib'e in this respect and that it can satisfy the varied requirements of many selectable traffic controls.

My traffic regulating device will allow indication of approaching changes without great necessity of educating the public, in other words, the interpretation of indication is simple and obedience to traffic regulation can be more easily enforced and traffic fatalities therefore more easily avoided.

In the preferred form of this device, as described, there is only one series of enclosing neon tubes for both ways and one dark disc and pointer for each direction. With another device of the same type and mounted on top or at the bottom of the first device, one may regulate traffic when the device is installed in the center of a cross-road street intersection and the rotating pointers facing the street with expectably more traffic may readily be contrived to travel faster.

Sub-division of this unit or a plurality of a whole unit or parts of it, can easily be arranged to answer any individual traffic regulating problem.

The pointers are rotated by a shaft driven by a motor and reducing gear mechanism in the case itself. It is very simp'e therefore to arrange other combinations for instance, for diagonal street intersections, (other than 90°), or for more than four-way intersections.

The driving motor may either be one of standard type, or one with a speed regulating mechanism, controlled from a box on the curb or with a clock and make-and-break switches in the control box so as to give electric impulses to the driving motor in the case at various time intervals. There may also be employed so-called Sel-Syn motors, self synchronizing motors (manufactured by the General Electric Co.) so that the speed of the driving motor may be easily controlled from the other parts of this device to be housed in a box at the curb of the street, or at a central point or any other point. This allows quick changes of regulation of traffic at various street intersections according to the municipal demand, which may change frequently.

I do not wish to be limited to a single tube for each of the concentric tubes, as two or more turns of a tube or two or more separate tubes functioning as one, might be desirable in some installations. It should also be pointed out that in the broader aspects of this invention, the neon tubes need not be concentrically arranged. The illuminated pointer, adapted to change color, being a novel feature, it is understood that this pointer may be used with a signal having any other type of stop or go light or without any other lights on the signal, without departing from the broad intended scope of my invention.

It is to be realized that the scope of my invention comprehends many equivalent constructions. The showing of the drawings and the particular description are merely specific exemplifications of a plurality of mechanical embodiments and arrangements.

I claim:

1. In a traffic regulating device, a pointer rotatable about a substantially horizontal axis and comprising a plurality of gas tube lights of different colors and each conforming to the shape of said pointer, and means adapted alternately to energize said gas tube lights whenever the pointer is directed toward the zenith and cyclically to maintain them illuminated.

2. In a traffic regulating device, the combination of a clockwise rotatable pointer adapted for illumination in different colors, a pair of illuminable lights of different color concentrically surrounding the path of movement of said pointer, means for rotating said pointer and automatically operating means controlled by said first mentioned means for periodically illuminating said surrounding lights and the different colors of said pointer each alternately upon every complete rotation of said pointer.

3. In a traffic regulating device, the combination of a clockwise rotatable pointer, distinct elongated lights of different color and each adapted to illuminate the entire length of said pointer, said lights being intended to indicate traffic "stop" and traffic "go" respectively, means for rotating said pointer and automatically operating means controlled by said first mentioned means for cyclically illuminating said lights of different color of said pointer each alternately upon every complete rotation of said pointer.

4. A traffic regulating device comprising a pointer adapted to rotate about a substantially horizontal axis, said pointer comprising a pair of adjacent illuminable gas tubes adapted to show different colors to indicate traffic "stop" and "go" respectively and means for alternately illuminating said tubes and maintaining them illuminated during each complete turn of said pointer through an arc of 360 degrees.

5. A traffic regulating device comprising in combination, a pair of red and green traffic controlling lights to indicate traffic "stop" and "go", respectively, means adapted to illuminate said lights at predetermined time intervals for the routine control of traffic, a pointer rotatable about a substantially horizontal axis, traffic controlling lights on said pointer corresponding to the first named light means for rotating said pointer, and means adapted to control the illumination of said pointer in synchronism with the illumination of one of said traffic control lights, said last mentioned means being automatically operated whenever said pointer reaches its zenith-designating position.

6. A traffic regulating device comprising a plurality of looped illuminable gas tubes to indicate traffic "stop" and "go" respectively, in combination with a rotatably mounted pointer enclosed by said looped tubes and likewise comprising illuminable gas tubes to indicate traffic "stop" and "go" respectively, means for effecting a clockwise turning movement of said pointer and means for energizing one looped tube and one corresponding pointer tube while deenergizing the other corresponding pair of tubes at each complete turn of the pointer.

7. A traffic regulating device comprising the combination of a pointer adapted to rotate, said pointer having an illuminable lamp thereon to indicate traffic "stop" and having a second illuminable lamp thereon to indicate traffic "go", mechanism for rotating said pointer and means for illuminating one lamp for one revolution of the pointer while the other lamp is extinguished and then illuminating the other lamp during the next succeeding revolution of the pointer while the first lamp is extinguished.

8. A traffic regulating device comprising the combination of a pointer adapted for clockwise rotation, said pointer having a red illuminable gas tube thereon to indicate traffic "stop" and having a green illuminable gas tube thereon to indicate traffic "go", mechanism for turning said pointer and means automatically operated by said mechanism for energizing the red tube during one cycle of the pointer while the green is deenergized and then energizing the green tube for the next succeeding cycle of the pointer while the red tube is deenergized.

9. In a traffic regulating device, the combination of a clockwise rotatable pointer, differently colored electrical lights carried by said pointer and adapted for illumination along substantially the entire length thereof, means for rotating said pointer in a substantially vertical plane, and electrical mechanism connected with said means and automatically operated thereby at predetermined time intervals for alternately energizing one of said colored lights whenever the pointer reaches its zenith-designating position and maintaining said illumination during one complete rotation of said pointer preparatory to switching to illumination of the other light at the next zenith-designating position of the pointer.

10. A traffic regulating device comprising a pair of illuminable gas tubes of different color to indicate traffic "stop" and traffic "go", respectively, a rotatable pointer carrying said tubes and means for rotating said pointer and for alternately illuminating said tubes, and maintaining the illumination of one tube during each 360° turning movement of said pointer while the other is deenergized.

11. In a traffic regulating device, a pointer, means for slowly rotating said pointer, electrical illuminating means mounted on said pointer and illuminating substantially its entire extent for the routine control of traffic when energized and means for cyclically energizing said illuminating means during predetermined extents of angular movements of said pointer.

12. In a traffic regulating device, circular illumination means, a pointer, means for slowly rotating said pointer, radially of said circular illumination means, electrical illuminating means mounted on said pointer and illuminating substantially its entire extent for the routine control of traffic when energized and means for cyclically energizing both of said illuminating means during predetermined extents of angular movements of said pointer.

13. In a traffic regulating device a pair of circular illumination means adapted to illumination in red and green respectively, a pointer, means for slowly rotating said pointer, a pair of electrical illuminating means mounted on said pointer and each illuminating substantially its entire extent in red and green colors respectively for the routine control of traffic when energized and means for alternately energizing pairs of said illuminating means of like color during predetermined extents of angular movements of said pointer.

14. In a traffic signal for preindicating approaching change of signal, the combination of electrical red illuminable means for indicating traffic "stop" and electrical green illuminable means for indicating traffic "go", both of said illuminable means being adapted to function in clockwise progression for denoting lapse of a predetermined measure of time, together with mechanism for energizing the red illuminable means during the range of its arcuate progression and for simultaneously deenergizing the green illuminable means, said mechanism being further more adapted alternately to energize said red and green illuminable means within their prescribed arcuate ranges, and a pair

of red and green illuminable elements concentrically disposed each with reference to the arcuate paths of the illuminable means of like color, respectively, said elements being alternately energized and deenergized in correspondingly-timed relation subject to the control of said mechanism.

Signed by me, this first day of July, 1929.

HERMAN J. GECHTER.