Aug. 30, 1927. 1,640,845

A. J. MASSEY

TRAFFIC SIGNAL

Filed July 2, 1921 2 Sheets-Sheet 1

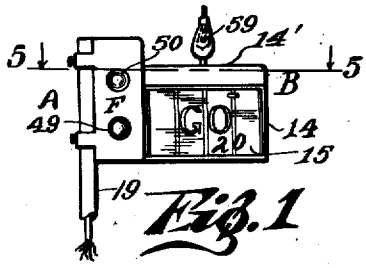


Fig. 1

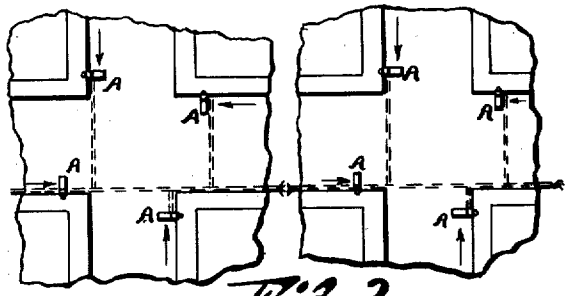


Fig. 2

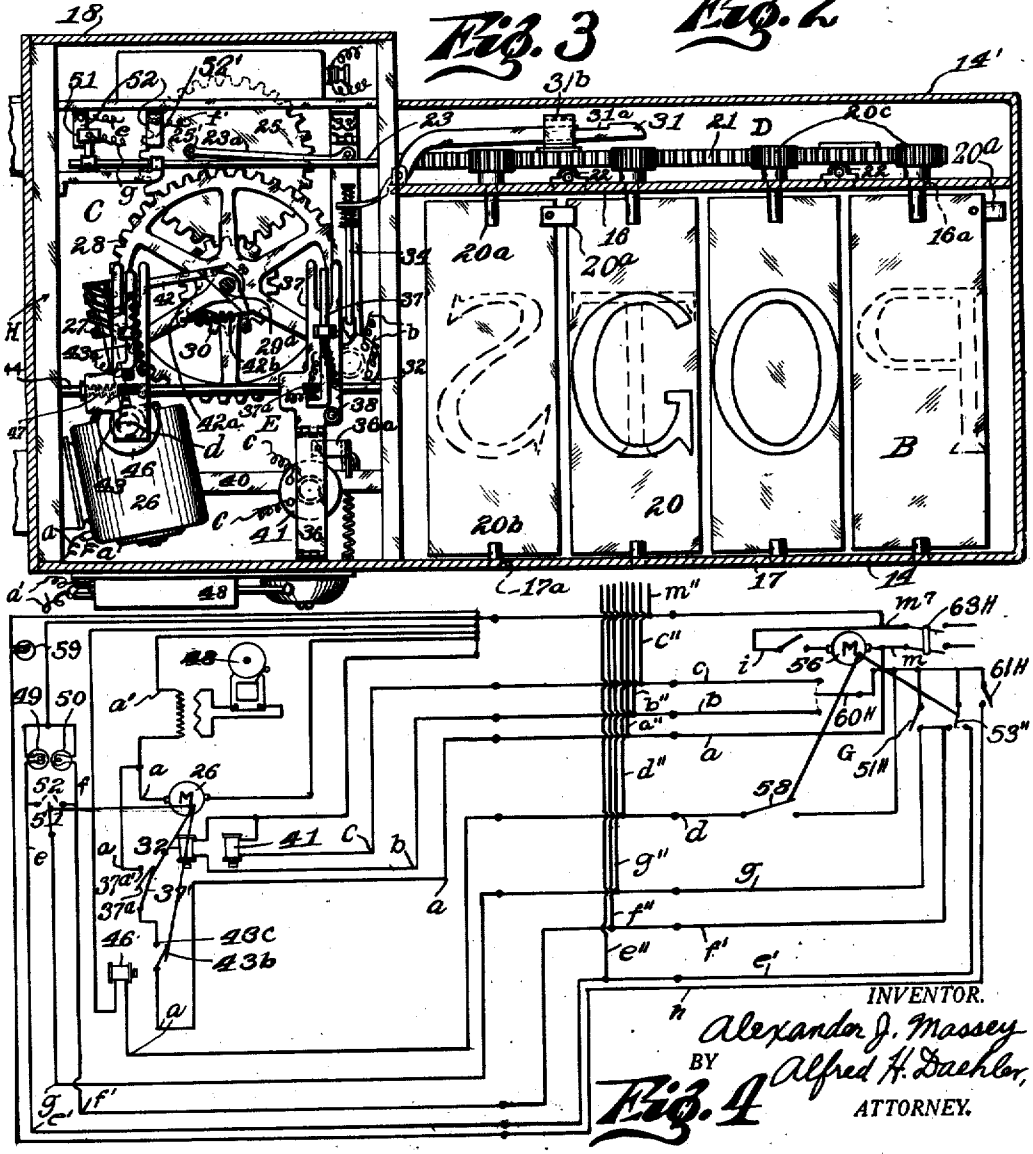


Fig. 3

Fig. 4

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Filed July 2, 1921 2 Sheets-Sheet 2

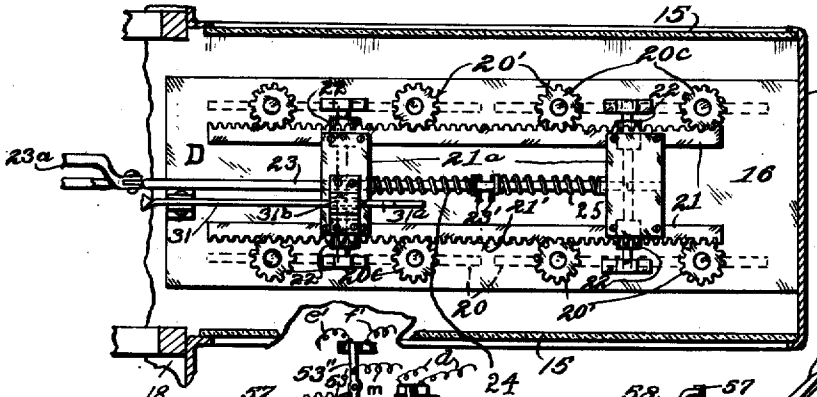

Fig. 5

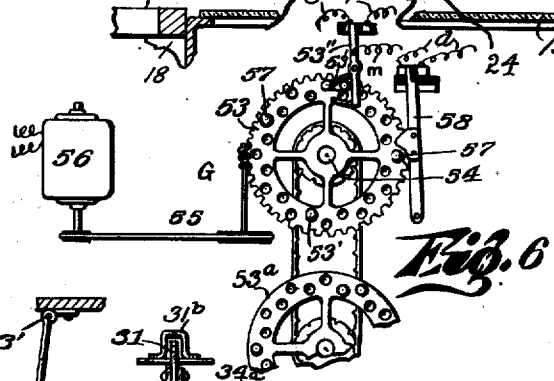

Fig. 6

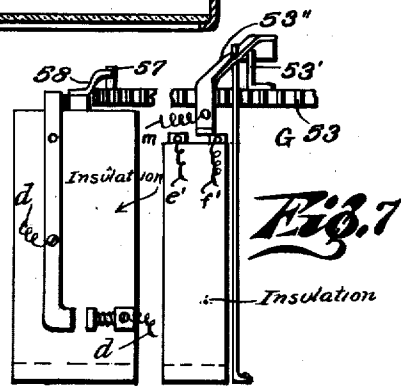

Fig. 7

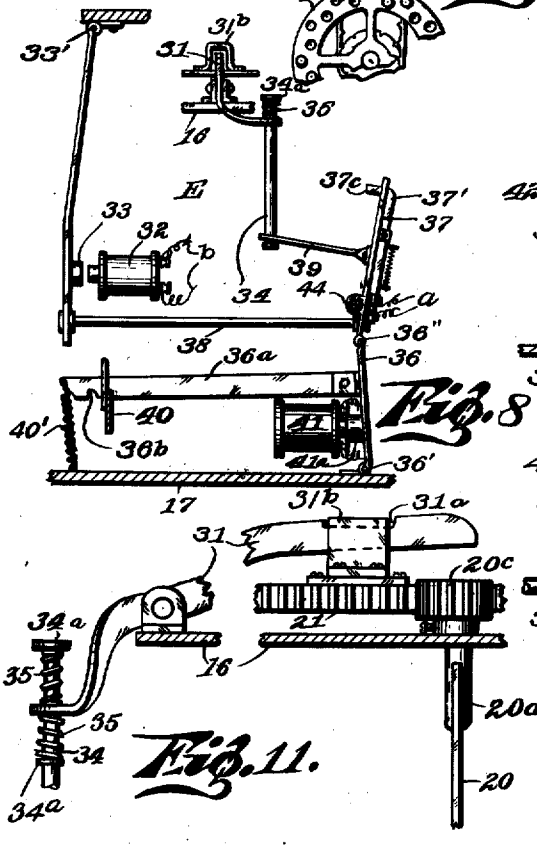

Fig. 8

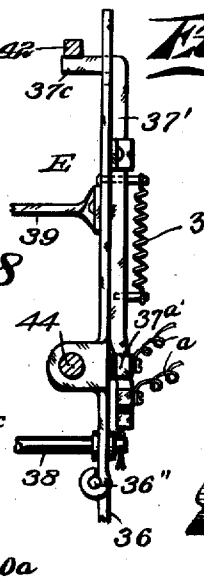

Fig. 9

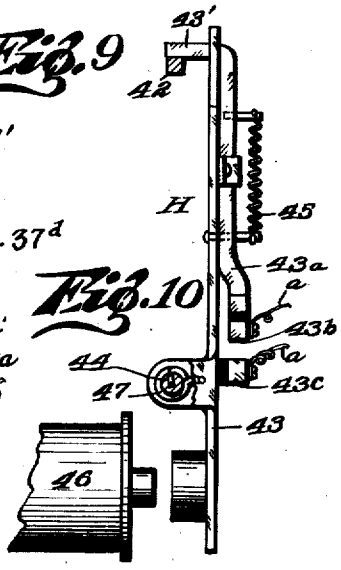

Fig. 10



Fig. 11.

INVENTOR.
Alexander J. Massey
BY Alfred H. Daehler,
ATTORNEY.

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# UNITED STATES PATENT OFFICE.

ALEXANDER J. MASSEY, OF LOS ANGELES, CALIFORNIA.

## TRAFFIC SIGNAL.

Application filed July 2, 1921. Serial No. 482,137.

This invention relates to traffic signals and more particularly to traffic signals for the control of traffic at intersecting streets, road crossings and the like; the invention has for its object to provide a signal of this general character which may be actuated to indicate to the drivers of vehicles, pedestrians and others when they may proceed in certain directions, when they must stop and when the traffic regulations have been suspended.

In certain signaling systems employed for the regulation of traffic in congested districts during business hours, no provision is made for a "neutral" or non-indicating position of the signaling members, and after such business hours the position of the signaling members indicates that the traffic rules are still in force while they are in reality suspended; in such cases it is necessary for an attendant to visit each signal and cover up indicating features thereof in order that persons in the traffic streams are not misinformed as to the true state of affairs.

In accordance with the invention, and in the preferred practice thereof, I provide a plurality of signals each properly positioned at a point of traffic control, as for instance at the proper corners of intersecting streets, and control all the signals of a certain set or group from a central station. To this end, I preferably provide a time controlled mechanism or device and control the signals of each such set or group by means of electrical circuits from the central point or station.

In the specific embodiment of the invention illustrated in the drawings, I employ, in each signal unit, a plurality of flat blades, vanes or signal members, each rotatable about its longitudinal axis and together with another or others of the vanes, presenting, in signaling action, a flat surface of relatively large area; I preferably provide a plurality of sets of such vanes in each signal unit, in order that the signal may be properly viewed from various directions. These vanes are preferably mounted for rotation about their axes in a suitable support and are differently colored or otherwise differentiated on their front and back faces; for instance, one face of each vane may be colored red and the letters of the word "Stop" placed on the red face of vanes of each set in order to further make clear the meaning of the red face of the signal, while the opposite faces of the vanes are white and across the white surface presented by all the vanes of each set will appear the word "Go". Furthermore, the vanes may be presented edgewise to a stream of traffic and consequently be invisible to persons in such traffic stream, so indicating that the signal control of traffic is not in force. Means are provided at each signal unit for positioning the blades in any of the above-mentioned indicating positions and such means are subject to control as to operativeness from the central station.

The invention further provides for night signaling by the substitution of lights of two colors provided in each signal unit (and corresponding to the colors of the vane faces) for the vanes, the vane actuation being suspended meanwhile, or if desired the lights may be operated in conjunction with the vanes, corresponding colors of vanes and lights being simultaneously actuated or presented to view. A further feature of the invention is the provision of white or ordinary lighting means adapted to illuminate the signal blades at night; all of such features of the invention are subject to control by an attendant at the central point of control, the electric impulse or current needed to provide for any of the lighting effects above outlined being controlled through the respective simple electrical switch.

A further object of the invention is to provide a signal and a signaling system of the character stated which will be relatively simple and inexpensive in construction and organization when its advantages such as positiveness in action, freedom from liability to get out of order or repair, susceptibility of voluntary control by an attendant at a central point of control, and general superiority in service are considered.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, combination, association, interrelation and mode of operation of parts, members and features, all as hereinafter described, shown in the drawings, and finally pointed out in claims.

In the drawings:

Figure 1 is a fragmentary front elevation of a signal constructed and organized to embody the invention;

Figure 2 is a fragmentary diagrammatic view of a street and two intersecting streets illustrating the preferred manner of in-

stalling the signals for intersecting streets with their oppositely moving right and left streams of traffic;

Figure 3 is an enlarged fragmentary front elevation of the signal shown in Figure 1, parts being broken away and sectioned for clearness of illustration;

Figure 4 is a wiring diagram illustrating a mode of control of a signal from a distant point or control or a plurality of signals from a central point of control at the right of the figure, the character "H" being used in connection with hand-operated switches, turnbuckles being used to indicate possible motor control of switches, and dotted lines thereto being in some cases used to indicate electro-magnetic control of such motor control;

Figure 5 is a fragmentary plan view partly in section of the signal shown in the other figures, the view being taken on the line $X^5$—$X^5$, Figure 1, and looking in the direction of the appended arrows;

Figure 6 is a fragmentary plan view of parts of time-controlled apparatus suitable for controlling a plurality of distant signals simultaneously from a central point;

Figure 7 is a view of a controlling switch;

Figure 8 is a fragmentary sectional view, parts being shown in elevation, of controlling means, including central positioning means and actuating mechanism, the view being taken at right angles to the showing in Figure 3;

Figure 9 is a fragmentary elevation on a larger scale of a signal switch and associated parts comprised in the neutral positioning means which are shown, in a different position, in Fig. 7;

Figure 10 is a view similar to Figure 9 but showing a switch which is operable, under automatic control, from a remote or central point; and

Figure 11 is an enlarged fragmentary view of portions of the mechanism for holding the vanes in neutral or non-signaling position.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing, in the embodiment of the invention therein shown, A designates in each instance, a traffic signal unit adapted to be placed at the intersection of two streets, B designates in each instance a composite signaling member of a signal unit A, C designates local means for operating the composite signaling members B, D designates means of mechanical or operative connection between the members B and the operating or rotating means C, E designates means for neutrally positioning the component vanes or parts of the member B, F designates an illuminated signal device adapted for use in conjunction with the respective signaling member B, or for use separately in substitution for the respective member B; and G designates generally a central station means for simultaneously controlling the actuation of a plurality of signals A.

Each signal A is shown as comprising a protective casing 14 having a top wall 14′ and having a glass 15 at each signaling face thereof and as having a horizontal upper plate member 16 and a horizontal bottom member 17, and an extension or housing 18, and in which casing and extension the signal mechanism is installed or mounted. A post 19 supports the signal casing and by reference to Figure 2 the preferred manner of mounting the signal casing over a street or the like will be understood, the post 19 being preferably placed on or near the curb with the signal projecting therefrom slightly outward and over the street in position to be viewed by the drivers of vehicles as well as by pedestrians on the sidewalk.

Each composite signaling member B is shown as comprising a plurality of flat blades or vanes 20, shown as four in number, each of which is formed with an upper journal or shaft $20^a$ and a lower journal $20^b$ on its central longitudinal axis. One vane assembly comprising, for example, four such vanes 20 is set in each of a plurality of faces of the casing 14, the lower journals $20^b$ being each received in one of a series of suitable bores $17^a$ in the bottom member 17 near the respective face of the casing, while each of the upper journals or shafts $20^a$ is received in one of a series of bores $16^a$ provided in the upper horizontal plate member 16. Where each upper journal or shaft $20^a$ projects through the upper wall 17, it has a gear $20^c$ fixed thereto; and intermediate means for transmitting motion thereto may include a frame comprising a pair of oppositely facing rack bars 21, between the two rows of gears $20^c$, so that the teeth 21′ of the respective rack bar are in mesh with the teeth 20′ of the gears $20^c$ of the corresponding set of vanes 20. Cross members $21^a$ unite the rack bars 21 and anti-friction rollers 22 mounted upon the member 16 support the rack bars. Connecting means such as a drive rod 23 also comprised in said intermediate means is passed through a horizontal aperture in each of the cross members $21^a$ and such drive rod has an abutment device or devices 23′ thereon between the cross members $21^a$, and compression coil springs 24, 25 surround the rod 23 at each side of the abutment devices 23′ and extend therefrom to the corresponding cross member $21^a$ so to provide a yielding or resilient drive means for the rack bar and the vanes connected thereto. A connecting rod $23^a$ also comprised in said intermediate means has its one end pivotally secured to the drive rod 23 and has its other end apertured to receive a crank pin 25′ fixed to one face of a drive gear 25, which gear 25 is ro-

tatably mounted in a suitable framework of the casing in the plane of the rack bars. The gears $20^c$, rack bar frame, drive rod, connecting link and crank gear just described constitute means of operative connection D between the members B and the operating means C. The outer vanes 20 of each set are each provided with a limiting finger $20^{a'}$ each of which contacts with the next adjacent inner vane when the vanes are aligned to form a composite signal face.

The operating means C is shown as comprising an electric motor 26 supported in the casing 14 and provided with a worm 27 on its shaft, a worm wheel 28 meshing with the worm 27 and fixed to a shaft 29 which is rotatably mounted in the casing framework, and a drive pinion 30 also fixed to the shaft 29 and so driven by the motor 26 and in mesh with the crank gear 25.

The neutral positioning means E is shown as comprising a latch member 31 pivoted to the member 16 and provided with a notch $31^a$ to receive a cooperating element $31^b$ fixed on one of the transverse members or cross members $21^a$ of the rack bar frame, and means for operating the latch member 31 to cause the same to be raised against the mentioned cooperating element to catch and hold the same as the rack bar frame travels in vane-rotating action. The notch $31^a$ is arranged to catch the frame and position the vanes in their half-way or neutral position, that is with the edges thereof presented to the traffic stream controlled by the signal, the thin flat vanes so becoming practically invisible. The means for operating the latch member may comprise an electro-magnet 32, subject to control from a central station, an armature 33 therefor, and means of operative connection including a link 34 between the electro-magnet and the overhanging inner end of the latch bar or member 31. The connected end of the latch member 31 is apertured to receive the link 34 which has a pair of compression coil springs 35 thereon between which the latch member end is held, abutment $34^a$ being provided on the link 34 to confine the springs 35, so producing a yielding or resilient compensating connection. A toggle switch device comprising a member 36 hinged at its lower edge to the bottom casing wall as at 36′ and hinged as at 36″ to an upper member 37 has a connecting link 38 extending therefrom to the armature 33; and the member 37 which is somewhat in the form of a bell crank has its horizontal arm 39 connected to the lower end of the link 34. Upon energization of the magnet 32, as from a central station, the armature 33 is attracted, and through the connections just described the outer end of the latch member is raised to contact with the mentioned cooperating element on a cross member $21^a$ which rides thereover until the notch is reached by the mentioned cooperating element and the corresponding end of the latch member is further lifted to catch the same in the notch, where it remains until released by controlling means provided to that end.

The lower toggle switch member 36 has a detent bar $36^a$ connected therewith and such bar $36^a$ has a pair of notches $36^b$ in its under edge and rides over a casing frame member 40. A notch $36^b$ is provided for each of the latch member positions, on and off, and the detent bar falls with the corresponding notch on the member 40 when a notch reaches the member 40, so yieldably holding the parts in either of their two positions of adjustment. A spring 40′ draws the detent bar downwardly.

Means such as a further electro-magnet, also subject to manual control from a central station, may be provided for releasing the rack bar frame from the latch member; and magnet 41 may be fixed in the casing in position to attract an armature $41^a$ provided on the lower hinged member 36 so as to collapse the toggle formed by the members 36 and 37, so releasing the latch member 31, and permitting vanes 20 to rotate.

In order that a circuit "*a*" through the motor 26, may be remade incidentally to the mentioned collapse and release, an electrical switch bar 37 is shown as mounted for reciprocation on the member 37 and is adapted for movement to close an electrical circuit by causing engagement between its contact point $37^a$ and a fixed contact point $37^{d'}$ carried by the member 37 when the toggle is in collapsed position as shown in Figure 8, the switch so formed being included in the circuit (*a*) of the operating means motor 26, the parts being brought to such positions upon energization of the magnet 41, as to permit the latch member to fall and free the vanes and rack bar frame. Thus, assuming the oscillation of the signal vanes is to be discontinued upon the energization of the magnet 32 the toggle is straightened incidentally to the stopping of the vanes in neutral position and a horizontal inwardly projecting finger $37^c$ provided on the end of the switch bar 37′ is moved into the path of travel of a switch-actuating stop arm 42 mounted upon and rotated by the shaft 29 of the operating means. In each revolution of the shaft 29 the arm 42 sweeps through the zone of the finger $37^c$, and when the parts are in the position shown in Figure 9, the vanes 20 being held in neutral position and the finger being in the path of the arm 42, the switch bar 37′ is depressed by the arm and the contact points separated, so breaking the motor circuit *a* and interrupting the action of the operating means while the rack bar frame is held against further movement by the latch member and until again re-

leased by energization of the magnet 41, when the motor circuit is again closed and the vanes act subject to the control of the controlling station. A tension spring $37^d$ normally holds or biases the switch bar 37' with the points of contact in closed position. An electrical circuit *b* is provided from the central point of control for the magnet 32 and another such circuit *c* is provided for the magnet 41; a manual switch 60 is provided for such circuits the point of control whereby the operator may cause the supply of electrical energy to energize either of the magnets 32 or 41 at will, so controlling the signal with respect to the operativeness or inoperativeness thereof, merely by sending an electrical impulse through the proper circuit. The armature 33 may be hinged to the casing framework as at 33'.

A further controlling switch device subject to control by electrical impulses from the point of control and used in the customary shifting of the vanes 20 at predetermined intervals, is shown at H, see Figs. 2 and 10. This device comprises an armature 43 pivoted to the casing framework as at 44 and provided with a reciprocatory switch bar $43^a$ having a switch point $43^b$ normally engaging a fixed switch point $43^c$ on the armature 43. A tension spring 45 holds the points in contact thereby closing the motor circuit "*a*", in case contact is made between $37^a$ and $37^{a'}$. An electro-magnet 46 is fixed to the framework of the casing in position to attract the lower arm of the armature 43. The switch bar $43^a$ has an inwardly projecting finger 43' which normally projects into the path of rotation of the switch-actuating stop arm 42, the armature 43 being normally held in proper position by a coil spring at 47. Upon energization of the electro-magnet 46, through a suitable electrical circuit *d*, subject to control by the time-controlled controlling means at the point of control, the armature is moved to carry the finger 43' out of the path of the stop arm 42.

The stop arm 42 is shown as mounted for oscillation upon the shaft 29, a drive arm $42^a$ therefor being fixed to the shaft 29, and a yielding or resilient connection, shown as a coil spring $42^b$, being interposed between such arms $42^a$ and 42.

It will thus be seen that at each electrical impulse sent through the magnet 46, the finger 43' is withdrawn from the path of the stop arm 42 and the motor circuit which includes the switch points $43^b$ and $43^c$ will be closed by such points contacting, and the shaft 29 will be permitted to make one revolution as the same is driven by the motor through the circuit of which electrical energy is permitted to flow until the stop arm completes one revolution, whereupon it strikes the finger 43' which meanwhile has returned to its path of travel, due to the cutting off of the electrical energy supply to the magnet 46. As the stop arm strikes the finger 43', the switch bar $43^a$ is lifted to its upper extreme position, the motor circuit is interrupted, and the stop arm is mechanically held by the finger 43' against further rotation until freed by the next impulse sent through the magnet 46.

Upon each revolution of the shaft 29, so caused and controlled, the crank gear 25, being geared to the shaft 29 in a one to two revolution ratio, makes only one-half of a revolution, and the crank pin thereon is moved from one "dead center" to the opposite "dead center" or from extreme inward to extreme outward position. The connected rack bar frame is consequently thrust outwardly at one revolution of the shaft 29, and drawn inwardly at the next revolution of such shaft 29. This results in all of the vanes being oscillated or alternately rotated in opposite directions upon each revolution of the shaft 29; by this arrangement the white sides of all of the vanes is brought to view at one revolution of shaft 29 and held exposed to view until the next impulse from the point of control through the magnet 46 causes or permits the next revolution of shaft 29 to reverse the direction of rotation of the vanes and so present the red faces of all of the same for the next time period; this movement of the vanes may be repeated throughout the traffic control period. An electric bell 48 may be provided and connected in any suitable manner as by a branch with the circuit of the magnet 46 or the motor circuit and so give audible warning that the signal is being actuated in traffic signaling action.

The means F may comprise a pair of colored electric light devices at each side of the signal casing. Each set of these lights may comprise a white light 49 and a red light 50 to correspond to the colors of the respective vane faces. A reciprocable switch point 51 (Figs. 3 and 4) is shown as mounted in the casing 14 and connected with the rack bar connections for reciprocation therewith. A switch point 52 is arranged at one end of the path of travel of the point 51 and connected with a circuit wire leading through the white light devices 49, and a switch point 52' is arranged at the opposite end of the path of travel of the point 51 and connected with a circuit wire leading through the red light devices 50. The switch point 51 may be connected with a supply wire *g* susceptible of incorporation in a circuit with either the wiring F of the red or the wiring E of the white lighting device. Upon closing, as by means of a simple manual switch $15^H$ at the central point of control, the circuit through such supply wire *g* connected with switch point 51, the

lights will be automatically synchronously operated in conjunction with vane movement.

An additional circuit wire $e'$ may lead from the white lighting devices to the point of control, and a further circuit wire $f'$ may lead from the red lighting devices to such point of control. These last-named circuit wires may terminate each at one point of a two throw switch 53'' alternately actuated by the time controlled mechanism at the central station. A simple switch $53^A$ at the point of control enables the operator to put this two throw time controlled switch in circuit with the lighting devices, whereupon a light signaling system without vane actuation may be had; it will be understood that all of the described circuits may be branches of a single main circuit $m$, $m'$, and that the simple switch $60^H$ controlling the stopping of the vane operation may first be employed to send an impulse through the stop device to neutrally position the vanes, before employing this independent central time control, upon the closing of the switch $53^H$, for a light signal device only; and any desired number of signal units may be cyclically controlled by corresponding interconnection with wires such as are indicated at $a''$, $b''$, $c''$, $d''$, $e''$, $f''$, $g''$, $h''$ and $m''$, leading to and from said units.

Time controlled controlling means for actuating one or a plurality of the signals just described may be organized as follows: A wheel 53 (see Figs. 6 and 7) may be rotatably mounted as at 54 and driven through suitable transmission device 55 from a constant speed electric motor or clock device 56. The wheel 53 is shown as being provided with a series of contact posts 57 each adapted to move a spring pressed switch bar 58 outwardly to close the circuit $d$ leading from such switch bar 58 to the magnet 46 of the signal; each such impulse will allow the motor circuit to close during one revolution of the shaft, and the vanes will shift their position at each impulse; the peripheral speed of the wheel 53 and the distance between succeeding contact posts or actuating pins 57 will determine the time period during which the signal vanes remain set without reversal. A plurality of such wheels 53, $53^a$, etc., may be employed when desired, or the signals of each group may all be connected and controlled through the same controlling circuits somewhat as suggested in Fig. 4. The pins or posts on the wheel 53, $53^a$, etc., may be varied as to spacing, so as to provide a time period of greater duration for the exposure to view of one face of each signal member B than the time period of exposure of the other face of each member B.

In case of employment of the light signal system centrally controlled, independently of and in substitution for the vane system, the hereinbefore mentioned two throw switch 53'' controlling the same, by interposition in the circuits including wires $e'$ and $f'$ may be actuated in one direction of throw by a post 53' on the wheel 53 and allowed to remain in closed circuit position until struck by and reversed or moved to its other position by the next succeeding post 53' on the wheel to reach the zone of operation of such switch.

A further electrical circuit $h$ may be controlled from the point of control by a simple switch $61^H$ and may lead through white or ordinary lights 59 provided on the signal casings 14 in positions to illuminate the vanes at night; but constant speed motor 56 may be operated to control switch 58, and upon closing the switch $62^H$ in a branch circuit "$i$", whether or not switches such as $51^H$, $53^H$ and $61^H$ are open, as they may ordinarily be during daylight hours; and the entire system may be controlled by means such as a master switch $63^H$, shown as adapted simultaneously to close or open both branches of a main circuit including wires "$m$" and "$m'$" between which the branch "$i$", containing motor 56 and switch $62^H$, is interposed.

The operation of the respective parts of my traffic signaling organization having been separately indicated above, it will be understood that the system comprises local units which include not only protected sets of vanes (20) provided with reciprocating means (21 etc.) for their indefinitely repeated oscillation from one signaling position to another signaling position, and continuously rotatable, motor-driven means (25 etc.) for driving said reciprocatory means, and also means (31 etc.) partially electro-magnetic, (32 etc.) subject to remote manual control (by switch $60^H$) for holding said vanes in a neutral position while incidentally rendering the rotation of the mentioned rotatable means effective (by disposing switch finger $37^c$ in the path of rotating arm 42) to break a circuit to the drive motor therefor (as when said units are to be rendered inoperative during the night) and also like means (41 etc.) subject to similar remote control, for an opposite effect (as when the use of said units is to be resumed); and also additional means ($36^a$, $36^b$, 40 and 40') for releasably retaining a toggle comprised in said holding means in either of the mentioned positions. Each unit comprises also means (46 etc.) subject to remote but automatic control (53 etc.) for periodically breaking the circuit to said motor at predetermined intervals; and also means (51 etc.) whereby signal lights in each unit may, from the mentioned point of remote control, either be subjected to automatic regulation by a local motor (26, on closing switch $61^H$) or operated by

a motor (56, on closing switch $61^B$) provided at the central station, for timing the automatic interruptions of current to said local motor.

Although I have herein described a single complete embodiment of my invention, it will be understood that various features thereof might be independently employed, and also that numerous modifications might be made, by those skilled in the art to which this case relates, without the slightest departure from the spirit and scope of this invention, as the same is indicated above and in the following claims.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. A signal of the character disclosed comprising: a plurality of vanes adapted for the presentation of like faces in joint signaling action and each of which is mounted for rotation about an axis, means for so mounting said vanes, remotely controllable means comprising a local motor and gearing means for rotating the vanes to present divers faces thereof alternatively to view, and remotely controllable means for holding said vanes at will in a neutral position; said signal comprising means whereby said vane-rotating means may be effective to interrupt the current to said local motor upon the completion of a half rotation of said vanes, moving the same to display positions, and means whereby the operation of said holding means also interrupts said current.

2. A signal of the character disclosed comprising: a plurality of vanes adapted for the presentation of like faces in joint signaling action and each of which is mounted for rotation about an axis, means for so mounting said vanes, remotely controllable means comprising a local motor and gearing means for rotating the vanes to present divers faces thereof alternatively to view, electromagnetic means responsive to remote electrical control for controlling said vane-rotating means; and additional means, comprising local electro-magnets disposed for opposite effects, for holding said vanes at will edgewise to the signal face plane; said signal comprising means whereby said vane-rotating means may be effective to interrupt the current to said local motor upon the completion of a half rotation of said vanes, moving the same through said edgewise position to display positions parallel with said signal face, and means whereby the operation of said holding means for one of said opposite effects also interrupts said current.

3. A signal of the character disclosed comprising: a plurality of vanes adapted for the presentation of like faces in joint signaling action and each of which is mounted for rotation about an axis, means for so mounting said vanes, local motor and gearing means for rotating the vanes to present divers faces thereof alternatively to view, means responsive to remote electrical control for controlling said local cane-rotating means; remotely controllable means for holding said vanes at will edgewise to the signal face plane, for a non-signaling effect, and electrical impulse controlling means, capable of responding to a clock device, at a point remote from the signal, for controlling a circuit of the motor of said rotating means; said signal comprising means whereby said vane-rotating means may be effective to interrupt the current to said local motor upon the completion of a half rotation of said vanes, moving the same through said edgewise position to display positions parallel with said signal face, and means whereby the operation of said holding means for one of said opposite effects also interrupts said current.

4. In combination: signal devices movable to either of two display positions; means for moving said devices from one display position to the other display position, said means including a motor and a motor circuit, switch means in said motor circuit biased to circuit-closing position; means operable by movement of the devices to their completed-movement positions, by said moving means, for moving the switch to open-circuit position; and means permitting the said switch means to again close the motor circuit, to operate the motor for the purpose of moving the devices to their other display position.

5. In combination: signal devices movable to either of two display positions and to a non-display position; means for moving said devices from one display position to the other display position, said means including both a motor circuit and switch means which comprises parts actuable, when the devices have reached their completed-movement positions, by said moving means, for opening the motor circuit; means permitting the said switch means to again close to operate the motor for the purpose of moving the devices to their other display position; and means operable to engage said moving means, to stop the devices in non-display positions.

6. In combination: signal devices movable to either of two display positions and to an intermediate non-display position; means for moving said devices from one display position to the other display position, said means including a motor and a motor circuit; switch means in said motor circuit biased to circuit-closing position; means operable by movement of the devices to either of their completed-movement positions, by said moving means, for moving said switch to open-circuit position; means permitting the said switch means to again close the motor circuit, to operate the motor for the purpose of moving the devices to their other display

position; and means operable to engage said moving means, to stop the devices in non-display position, said last-mentioned means including means for opening the motor circuit when said devices reach said non-display position.

7. In a traffic signaling system for street intersections and like places: a plurality of signal devices each adapted for indicating three distinct conditions appertaining to a traffic route on which the same is located and each comprising a display face for indicating that traffic is to proceed and a display face for indicating that traffic is to stop; means in each signal and comprising parts driven by local motors for alternately displaying said faces by moving the same through a non-display neutral position; means, subject to central manual control and comprising latches for neutrally positioning both of said faces to indicate the suspension of traffic regulation by the signal device, and central means, comprising a motor and switches movable indirectly thereby, for controlling, at will, either the intervals of display or the neutral positioning latches of a plurality of said signal devices.

8. In a traffic signaling system for street intersections and like places; a plurality of signal devices each adapted for indicating three distinct conditions appertaining to a traffic route on which the same is located and each comprising a display face for indicating that traffic is to proceed and a display face for indicating that traffic is to stop, a local motor and gearing in each signal for alternately displaying said faces by moving the same through a non-display neutral position; means, subject to remote control and comprising a latch in each signal, for neutrally positioning both of said faces, to indicate the suspension of traffic regulation by the signal devices, and time-controlled electrical impulse controlling means for controlling the signal face displaying means of a plurality of said signal devices, said displaying means being subject to neutralization by centrally controllable means which include a manual switch in a circuit containing a latch-operating electromagnet in each signal device, and subject to remote restoration by means comprising an additional local electromagnet disposed for an opposite effect,—each of said last-mentioned electromagnets being provided with an armature which is secured to a pivoted member which is movable thereby for an unlatching effect.

9. A signal of the general character disclosed comprising: a set of blades mounted on parallel axes and provided with means to turn the same through a partial revolution from a neutral position, to present a "stop" signal face, said means being operative intermittently to turn said blades back one-half revolution from their stop signaling position, and through said neutral position to present a "go" signal face; remotely controllable latch means to catch and hold said blades at will in said neutral position; and means for discontinuing the energization of said turning means when said blades are so held.

10. A traffic signal of the general character disclosed comprising: a set of blades mounted on parallel axes and provided with means to turn the same through a partial revolution from a neutral position to present a "stop" signal face, said means being operative intermittently to turn said blades back one-half revolution from their stop signaling position and through said neutral position to present a "go" signal face; time controlled means to predetermine the intervals between said turning movements; remotely controllable means comprising a notched member and a cooperating latch member, one of these being movable by said blade-turning means, for locking and holding said blades at will in said neutral position; and means for discontinuing the energization of said turning means when said blades are so held.

11. A device of the general character described comprising: a plurality of flat blades, mounted on substantially parallel axes in a suitable frame; and means whereby the rotation of a motor, which is in a motor circuit containing also a switch which is biased toward a circuit-closing position, is effective to cause said blades to make one-half revolutions laterally in opposite directions; remotely controllable means including local switches operable by said blade revolving means, and controlling the energization of said motor, for predetermining the intervals between said one-half revolutions; remotely controllable means for holding said blades against revolution; and means for discontinuing the energization of said turning means when said blades are so held.

12. In a signaling organization of the general character described: vanes mounted on substantially parallel vertical axes and movable between alternative indicating positions; operating means therefor comprising a motor, in a motor circuit, gearing driven by said motor and a crank; means, movable by said gearing, whereby the operation of said motor interrupts the current thereto, and intermediate means whereby each half turn of said crank shifts said vanes from one indicating position through a neutral position into another indicating position; disengageable means, including a latch bar movable by an armature controllable by energization of an electromagnet from a central point, for catching an element upon said intermediate means, to hold said vanes in said neutral position; and

means for discontinuing the energization of said turning means when said blades are so held.

13. A traffic signal including a stationary support, a signaling element on said support, means for moving said element to two display positions and to an intermediate non-display position, normally disengaged means for stopping and holding said signaling element in the non-display position,—said last-mentioned means including an oscillatable latch means for engaging a part of said signaling element, a normally "broken" toggle joint connecting said latch means and said support, and electro-magnetic means for expanding said toggle joint to thereby oscillate said latch means into position to engage said signaling element.

14. A traffic signal of the general character set forth in claim 13, which includes a motor for moving said signal element in a supply circuit; a switch having a biased; arm and in which the said toggle is provided with means for so disposing said switch arm that the continued operation of said motor breaks the supply circuit thereto.

15. A traffic signal of the general character set forth in claim 13, which includes a motor for moving said signal element in a supply circuit; a switch having a biased arm; and in which the said toggle is provided with means for so disposing said switch arm that the continued operation of said motor breaks the supply circuit thereto; and in which the "breaking" of said toggle releases said latch and permits said switch to close.

16. A traffic signal of the general character set forth in claim 13, which includes a motor for moving said signal element in a supply circuit; a switch having a biased arm; and in which the said toggle is provided with means for so disposing said switch arm that the continued operation of said motor breaks the supply circuit thereto, and in which said toggle is provided with means releasably holding the same in either a "broken" or an expanded position.

17. A traffic signal of the general character set forth in claim 13, which includes a motor for moving said signal element in a supply circuit; a switch having a biased arm; and in which the said toggle is provided with means for so disposing said switch arm that the continued operation of said motor breaks the supply circuit thereto; and in which means are also provided whereby the operation of said motor is rendered contingent upon the closing of a second switch, in the circuit including said motor, by electro-magnetic means energized periodically from a remote point.

18. A traffic signal of the general character set forth in claim 13, which includes a motor for moving said signal element in a supply circuit; a switch having a biased arm; and in which the said toggle is provided with means for so disposing said switch arm that the continued operation of said motor breaks the supply circuit thereto; and in which means are provided whereby the operation of said motor is rendered contingent upon the closing of a second switch, in the circuit including said motor, by electro-magnetic means energized periodically from a remote point, and in which means are provided for opening said second switch after a predetermined interval.

19. An organization of the general character defined in claim 12 in which means are provided whereby the rotation of said crank is incidentally effective to open and close alternative circuits through signal lights, one end of a longitudinally slidable rod to which said crank is connected being provided with a movable contact element and the other end thereof being comprised in said intermediate means.

20. A traffic signal operating mechanism, for signals having movable signal faces comprising: a rotatable device making a one-half revolution in each signal face-actuating movement; a rod for connecting the same with a signal face-moving member; motive means energized by an electric circuit for rotating said device; a switch biased toward a position in which it opens the circuit including said motive means and thereby controlling said motive means; and means of operative connection between said device and said motive means,—said last-mentioned means comprising a shaft rotated by said motive means and carrying an arm movable thereby to open said switch at each half-revolution of said shaft.

21. A traffic signal operating mechanism, for signals having movable vanes carrying oppositely disposed signal faces, comprising: an intermittently rotatable device making a one-half revolution in each signal face-actuating movement,—to bring said faces to a display position; a rod for connecting the same with a signal face-moving member; a motor, in a circuit for rotating said device; means of operative connection between said device and said motor; and biased switch means, in said circuit, for controlling the supply of energy to said motive means and acting to cut off, at the end of each one-half revolution of said signal face-actuating device, the energy supplied to said motor,—said means of operative connection comprising a shaft rotated by said motive means and carrying a means for opening said switch at the completion of each half revolution thereof.

22. A traffic signal operating mechanism of the general character defined in claim 22 which comprises additionally: means for opening said circuit, to cause the cessation

of movement of said intermittently rotatable device.

23. A traffic signal organization of the general character defined in claim 22 which comprises additionally: means for opening said circuit, to cause the cessation of movement of said intermittently rotatable device; and positive stop means, comprising a resiliently connected arm, to prevent overrunning of the signal vanes.

24. A traffic signal organization of the general character defined in claim 22 which comprises additionally: means for opening said circuit, to cause the cessation of movement of said intermittently rotated device; positive stop means, comprising a loosely connected arm, for preventing overrunning of the signal vanes; and means to hold the signal face-moving device in non-signaling position, upon the suspension of traffic rules.

In testimony whereof, I have signed my name to this specification.

ALEXANDER J. MASSEY.

of movement of said intermittently rotatable device.

23. A traffic signal organization of the general character defined in claim 22 which comprises additionally: means for opening said circuit, to cause the cessation of movement of said intermittently rotatable device; and positive stop means, comprising a resiliently connected arm, to prevent overrunning of the signal vanes.

24. A traffic signal organization of the general character defined in claim 22 which comprises additionally: means for opening said circuit, to cause the cessation of movement of said intermittently rotated device; positive stop means, comprising a loosely connected arm, for preventing overrunning of the signal vanes; and means to hold the signal face-moving device in non-signaling position, upon the suspension of traffic rules.

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## CERTIFICATE OF CORRECTION.

Patent No. 1,640,845. Granted August 30, 1927, to

ALEXANDER J. MASSEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, line 10, for "60" read "60 H"; page 5, line 12, for "53 A" read "53 H", and line 105, for the word "and" read "but"; page 6, line 68, claim 3, for the compound word "cane-rotating" read "vane-rotating"; page 8, line 128, claim 22, for the numeral "22" read "21"; page 9, lines 4 and 12, claims 23 and 24, for the numeral "22" read "21"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of October, A. D. 1927.

M. J. Moore,
Acting Commissioner of Patents.

Seal.

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