May 17, 1927. 1,628,756

C. TAYLOR

SIGNALING DEVICE

Filed Jan. 12, 1923

Fig. 1.

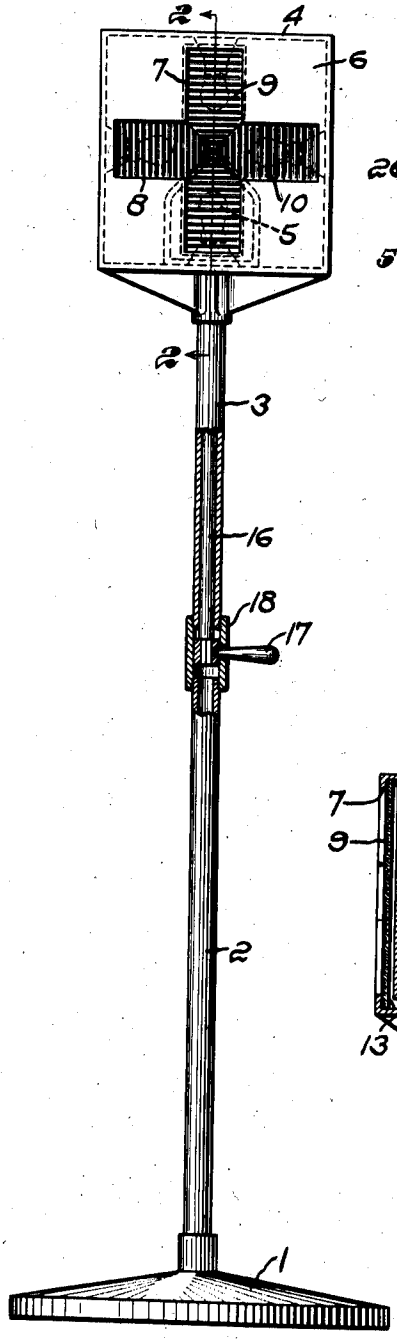


Fig. 4.

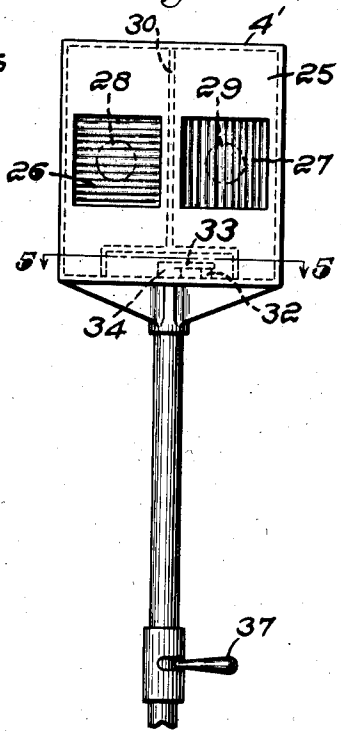


Fig. 6.

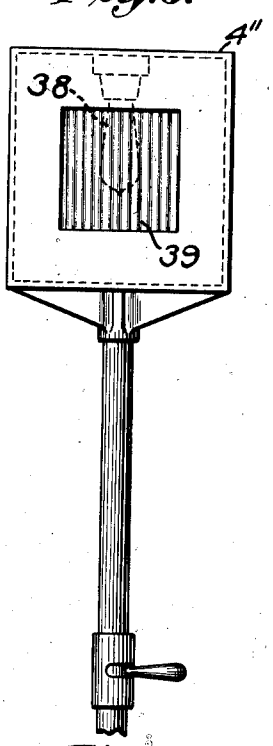


Fig. 2.

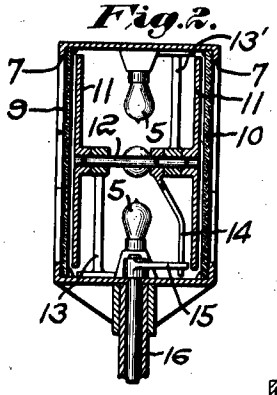


Fig. 3.

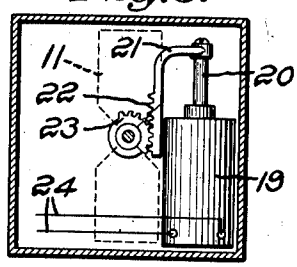
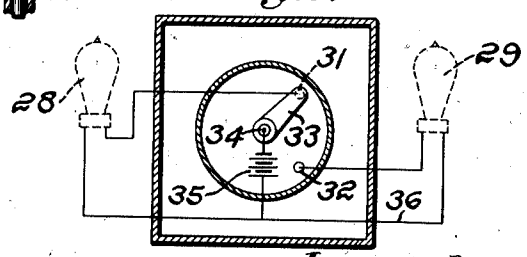


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHASE TAYLOR, OF WASHINGTON, DISTRICT OF COLUMBIA.

SIGNALING DEVICE.

Application filed January 12, 1923. Serial No. 612,165.

This invention relates to signaling devices or semaphores and is particularly adapted for use in controlling vehicular and railway traffic but is not limited thereto exclusively.

In order that my invention may be clearly understood I have in the accompanying drawings disclosed certain embodiments thereof chosen for illustrative purposes, wherein—

Fig. 1 is an elevation of a signal or semaphore according to one form of my invention and a support therefor;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section illustrating a distant control mechanism adapted for use with the semaphore illustrated in Fig. 1;

Fig. 4 is an elevation of a second form of signal or semaphore illustrating my invention;

Fig. 5 is a sectional view partially diagrammatical on a line corresponding to the line 5—5 of Fig. 4; and

Fig. 6 is an elevation of a semaphore illustrating still another form of my invention.

As set forth in my copending application Serial Number 535,190, filed Feb. 9, 1922, now patent 1,553,730, dated Sept. 15, 1925, of which the present application is a continuation in part, it is a proven fact that at least four per cent of all people are color-blind. In the case of automobile or other vehicular traffic this fact is of serious consequence since operating licenses are granted to practically any person who can operate an automobile, without examination for color-blindness. It is also of great importance in connection with steam or electric railway traffic. Although applicants for positions as locomotive engineers and the like customarily have their vision tested, it is quite possible and not at all unusual for them subsequently to become color-blind, as from the abuse of coffee, alcoholic beverages or other causes.

An important object of my invention is to provide a semaphore or similar signaling device provided with a light, the appearance of which independent of the color thereof will convey the desired signal or information to a person observing the same whether or not he or she be color-blind.

Referring first to Figs. 1 to 3, the base of the semaphore or signal is indicated at 1 and the upright or post is indicated as a whole at 2. The upper portion 3 of said post is preferably tubular and supports at its upper extremity a receptacle or casing 4 which may be rectangular as shown, or of any other suitable form. Said casing constitutes a protective container for a suitable light source, such as the electric lamps indicated at 5, light from which is rendered visible upon one or more of the side faces of said casing.

Opposite faces of said casing, one of which is indicated at 6 in Fig. 1, are each provided with elongated rectangular windows 7 and 8. One window 7 is preferably arranged with its longer dimension extending vertically while the other window 8 extends horizontally or transversely of the casing. The vertically disposed window 7 is provided with a transparency or lens 9 which may be of a distinctive color, preferably green, customarily employed to indicate a clear way or "go." The horizontally disposed window 8 is likewise provided with a transparency or lens 10 colorable in a distinctive manner, preferably red, customarily indicating danger or "stop."

In this manner I provide a vertical window or light transmitting area which is relatively narrow as compared with its height and which exposes a vertically disposed light configuration, and also a horizontal window, relatively broad as compared with its height, which exposes a horizontally disposed light configuration. Said transparencies or lenses as shown cross each other at approximately their mid points, and desirably are oppositely recessed at their central portions in the manner clearly shown in Fig. 1 whereby the effect is of a substantially continuous horizontal light form and of a substantially continuous vertical light form. Obviously, however, the windows may be differently arranged, as for example, one above the other, or side by side. All light rays other than those transmitted by the lenses are retained or shielded within the casing 4.

Desirably I provide means whereby one or the other of the light exposing windows 7 and 8 may be obscured. For this purpose I have shown in Figs. 1 and 2 shutters 11 having central hubs fixed upon opposite ends of a rotatable shaft 12 journalled in suitable bearings formed in brackets 13, 13' secured to the inner wall of the casing.

Said shutters 11, as indicated in dotted

lines in Fig. 1, are of a form and size corresponding to the openings or windows, but desirably slightly larger so as to overlie the same. Said shutters are adapted to be turned into the vertical position shown in Figs. 1 and 2 in which the vertical windows 7 are obscured and the light is exposed through the horizontal windows 8 or into a horizontal position obscuring the windows 8 and permitting the light to be visible at the vertical windows 7.

Any suitable means may be employed for rotating said shutters and herein I have provided said shaft 12 with a depending finger 14 fixed thereto, the lower end of which finger projects between the prongs of a yoke or U-shaped member 15 secured to the upper end of a rod 16 rotatably mounted within the tubular post 3. A lever or handle 17 is secured to the lower portion of said rod 16 and projects laterally of the post 2 through a suitable slot in a sleeve 18. By moving the handle 17 horizontally the shutters are rotated to expose either the horizontal or vertical light configurations, the arrangement in Fig. 2 being particularly adapted for use in controlling vehicular traffic at street crossings.

In Figs. 1 and 2 I have shown two opposite faces of the casing carrying the signal transparencies, there being a shutter 11 for each face. Obviously the other two faces of the four sided casing may be and desirably are provided with similar light exposing configurations. The opposite shutters 11 as shown are operated simultaneously, but may, if desired be independently or consecutively actuated.

Where light shapes are provided upon four faces of the casing, as is desirable in connection with street traffic, it will be understood that contrasting or opposite configurations or light shapes will normally be displayed upon adjacent faces; that is, if the north face shows a horizontally disposed light form, which is instinctively interpreted as barring the way and indicating "stop," the east or west faces, or both, will display a vertically disposed light form, indicating "go." If desired, characters such as "Stop" and "Go" or the like may be provided upon the appropriate transparencies or lenses. All four shutters, when employed, may be operated simultaneously or individually or in pairs, as desired. By means of controlled shutters for four faces the necessity of turning the entire sign or signal, as heretofore customary, is avoided.

In Fig. 3 I have shown a distant control mechanism for the shutters whereby my signal is adapted for use in connection with railway traffic, or for other purposes in which distant control thereof is desired. In said figure I have indicated a solenoid at 19 having an armature 20 to the upper end of which is attached a laterally projecting arm 21 having the end portion thereof bent downwardly and provided with a toothed rack 22. Said rack is adapted to mesh with a gear segment 23 fixed upon the shaft supporting the shutters 11.

Current may be supplied to said solenoid from any suitable source, as through the conductors 24. When the circuit is completed in any desired manner the armature 19 is drawn downwardly thereby moving downwardly the rack 22 and rotating the shutters 11 into horizontal position, said shutters being returned to the vertical position shown in Fig. 3 by any suitable means such as a spring (not shown) or if desired a double acting solenoid or a separate solenoid may be employed. Obviously said control may be employed in connection with a signal or semaphore having light forms displayable on but a single face as is usual in railway semaphores.

Referring now to Figs. 4 and 5, illustrating a second embodiment of my invention, I have shown a standard 2′ supporting a casing 4′ preferably rectangular and adapted to display colored light beams of predetermined form or geometrical position at one, two or four faces thereof. Either one or two faces may be employed when using the signal in connection with railway traffic, while four faces are preferably for use with vehicular traffic, particularly at street intersections.

One face of said casing 4′ is indicated at 25 in Fig. 4 and is provided upon opposite sides of its vertical median line with oppositely positioned light filtering, distorting or refracting means whereby light beams of different directional appearance and differing in cross-sectional contour or configuration are displayable. Accordingly I have represented at 26 a multiple cylinder or other suitable lens which is adapted to transmit a light beam or beams of apparently infinite verticality; that is, the rays of light coming therefrom appear to extend vertically only and to a vertical distance above and below the light source limited only by the power of the latter. Spaced from said lens 26 is a second light filtering lens 27 for passing a light beam or beams of apparently infinite horizontality. The light rays from said lens 27 appear to extend in a horizontal direction only, or at right angles to the rays from the lens 26. Said lenses 26 and 27 may if desired be colored in any suitable and preferably different colors as green and red respectively. This same type of light filtering lens may also be and preferably is employed in connection with that form of my invention shown in Fig. 1 and such lenses are shown in said figure although in that embodiment of my invention such light filtering lenses are not essential to the formation of

contrastingly shaped light beams since therein the openings in the casing or container are themselves contrastingly shaped.

Desirably a light source is provided for each lens such as the electric lamps 28 and 29 positioned in compartments within the casing 4′ separated by the partition indicated at 30. Means is furnished for alternately or selectively illuminating said lamps. For this purpose I provide contact members 31 and 32 and cooperating contact finger 33 fixed upon the upper end of a rod 34 rotatably supported within the standard 2′. As represented partially diagrammatically in Fig. 5 said swingable finger 33, which is insulated from its supporting rod 34, is connected with one side of a suitable power source indicated at 35, the other side of which is joined by a common conductor 36 with one terminal of each of the lamps 28 and 29. The other terminals of said lamps are connected with the contact members 31 and 32 respectively.

In operation, when the finger 33 is moved into contact with one or the other contact member 31 or 32, as by means of the handle 37 extending from the rod 34 one or the other of the lamps is illuminated thereby to display either a vertical or a horizontal light beam. If desired the lamps 28 and 29 may themselves be colored green and red or other color respectively, the lenses then being uncolored. While I prefer to employ separate lamps for each lens obviously I may provide a single light source together with means similar to that shown in Figs. 1–3 for obscuring either lens at will.

While I have shown lens means for casting light beams either vertically or horizontally positioned, obviously I may provide an additional lens or lenses upon the same face of the casing for transmitting a beam of still different directional appearance, as for example diagonal or at an angle of 45° to either side of said vertical beam. Such a beam which may be colored yellow or other color, is employed to give warning that a change of signals is about to be made, or in connection with railway traffic, to indicate that a block beyond the next adjacent block is occupied.

In Fig. 6 is illustrated another embodiment of my invention wherein the casing 4″ carries upon each side face a single light filtering lens, similar to those shown in Figs. 4 and 5, the casing itself being mounted for turning movement upon its standard 2″. Either two or four faces of the casing may be provided with lenses depending upon the circumstances under which the signal or semaphore is to be employed. A single light source such as the lamp indicated at 38 illuminates all the signal faces.

The lens 39 shown in Fig. 6 is arranged to cast a horizontal light beam or beams, and may be colored, as red. At least one face at right angles to that appearing in Fig. 6 carries a lens arranged at a different angle from lens 39 and preferably disposed so as to shed a vertical light beam or beams desirably colored, as green. Where four faces are employed it will be understood that the opposite faces as for example, north and south, carry similar lenses. If desired the lenses upon adjacent faces may themselves be of different shapes, as in my aforesaid copending application.

From the foregoing description it will be understood that I have provided a signal or semaphore having a lamp or lamps arranged to display a difference in shape as well as in color in casting a beam of light. In accordance with my invention the light beam is vignetted or given a predetermined contour or geometrical configuration or form, or by preferably colorable means said beam is resolved or lengthened so as to present a ray or rays of predetermined direction or geometrical position of apparently infinite length.

My invention is not limited to the particular embodiments shown for illustrative purposes, the scope thereof being set forth in the following claims.

1. A traffic signal comprising a casing having a plurality of faces, a light source in said casing, a pair of lenses for producing from said source a series of substantially parallel bands of light extending transversely to the direction in which the said light is projected, means mounting said lenses in the faces of said casing, the length of the bands of one series extending at such an angle to those of another as to differentiate the signals produced thereby, and means selectively permitting one only of said series of bands to be viewed at one time from a given point of observation.

2. A traffic signal comprising a casing, a light source therein, said casing having one or more faces for the display of light signals, a pair of lenses for each such face and means for mounting them on said casing to transmit light from said source through the respective face or faces, said lenses each producing a series of substantially parallel bands of light extending transversely to the direction of projection of said light, said bands from one lens of each pair extending at such angle to those of the other lens of the same pair as to differentiate the signals produced thereby, and means selectively permitting the projection of light through one lens only of each pair at any given time.

3. A traffic signal comprising a casing, a light source therein, said casing having one or more faces for the display of light signals, a pair of lenses for each such face and means for mounting them on said casing to transmit light from said source

through the respective face or faces, said lenses each producing a series of substantially parallel bands of light extending transversely to the direction of projection of said light, said bands from one lens of each pair extending at such angle to those of the other lens of the same pair as to differentiate the signals produced thereby, and means selectively permitting the light from one lens only to be viewed at any one time by an observer facing a given pair of lenses.

4. A signaling device particularly for use in controlling traffic comprising a light source, a protective container for said light source, a lens, means supporting said lens on said container in position to receive light from said source, said lens being constructed to transmit the same as a light signal comprising a series of substantially parallel bands extending in a predetermined direction transverse to the direction in which the light is projected, and means operative at will to control the transmission of light from said source to said lens, said signal having by reason of its directional extent a predetermined informational value irrespective of words, color or the like.

5. A semaphore or like signaling device comprising a container, a source of light therein, said container having one or more faces provided with a plurality of refracting lenses for producing from said source a series of parallel bands of light extending transversely to the direction in which the said light is projected, at least one of which lenses is positioned on said container to project light beam signals visible as a series of substantially vertically extending light bands, and another of which lenses is constructed and positioned to project light beam signals visible as a series of substantially horizontally extending light bands.

6. A semaphore or like signaling device comprising a casing, a light source therein, said casing having one or more faces for the display of light signals, a plurality of lenses, at least one for each such face, and means for mounting them on said casing to transmit light from said source through their respective face or faces, said lenses producing each a series of substantially parallel bands of light extending transversely to the direction of projection of the light, said bands from one lens extending at such angle to those of another lens as to differentiate the signals produced thereby, and distantly controllable means permitting one only of said series of bands to be viewed at one time from a given point of observation.

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

CHASE TAYLOR.