No. 723,414. PATENTED MAR. 24, 1903.

J. J. SILL.

COLORED SIGNAL LAMP.

APPLICATION FILED JAN. 16, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

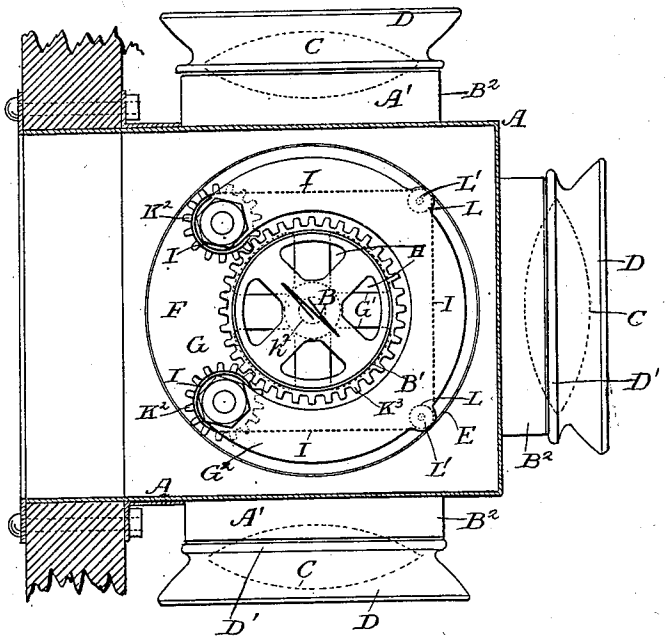
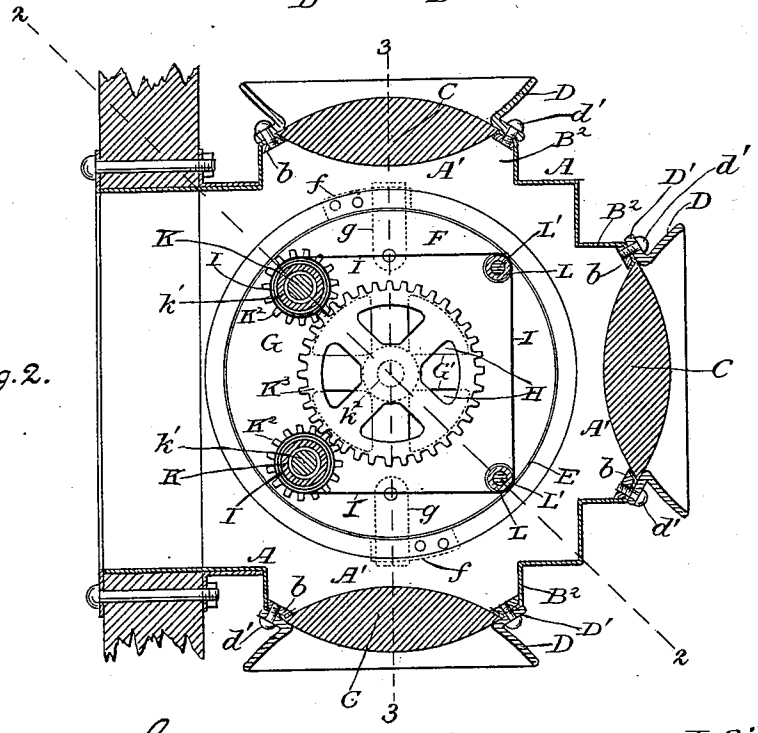


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

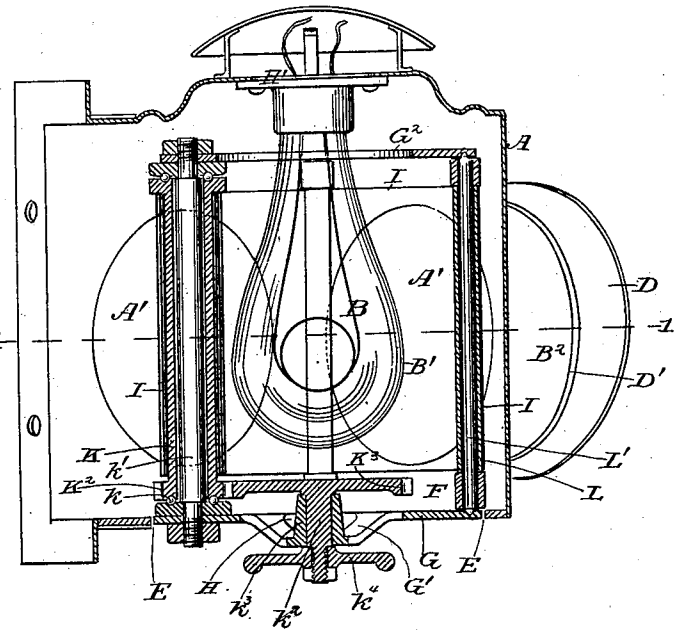


Fig. 5.

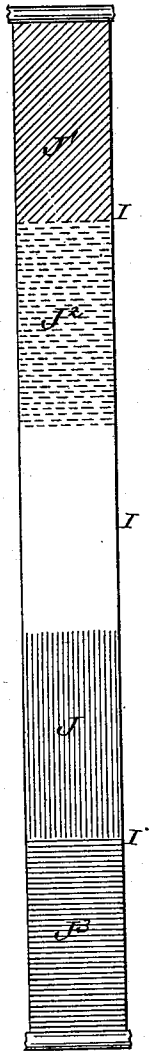
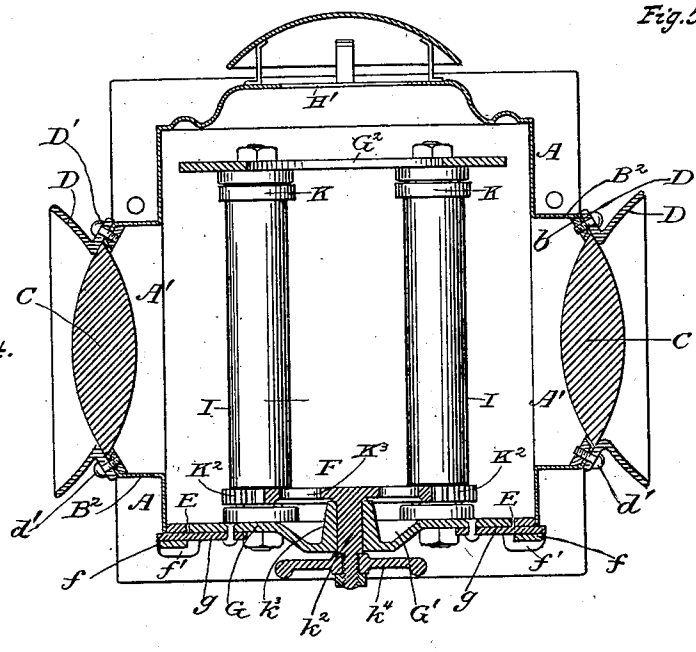


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN J. SILL, OF ALBANY, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE RAILWAY APPLIANCE COMPANY, OF ALBANY NEW YORK, A CORPORATION OF NEW YORK.

COLORED-SIGNAL LAMP.

SPECIFICATION forming part of Letters Patent No. 723,414, dated March 24, 1903.

Application filed January 16, 1901. Serial No. 43,455. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SILL, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented new and useful Improvements in Colored-Signal Lamps, of which the following is a specification.

My invention relates to colored-signal lamps in which the colored medium for passage of light to a viewer is adapted to be at pleasure moved from view and replaced by a medium of a different color.

The objects of my invention are, first, to provide in case of a signal-lamp an interior light, an exterior magnifying-lens, and a light-coloring medium between said interior light and exterior lens that a magnified view of the light may be presented to the viewer; second, to provide in a case of a signal-lamp an interior light, an exterior lens, and a series of two or more light-coloring mediums each of a different color and adapted to be moved at pleasure one at a time to a situation between said exterior lens and the said light that the color of the light-coloring medium directly between the interior light and the lens may be presented magnified to the viewer; third, to provide in a case of a signal-lamp an interior light and an exterior lens and a ribbon-form light-coloring medium having two or more fields of contrasting color, which are respectively adapted to be moved between the light and lens in order as preferred; fourth, to provide in a case of a signal-lamp an interior light, an exterior lens, a ribbon-form light-coloring medium having in its length a series of fields of contrasting color, each of which adapted to be moved to a situation between said light and lens and mechanism for moving said ribbon-form light-coloring medium, so that any preferred portion of the same may at pleasure be brought in situation between said lens and said light.

Other objects and advantages of the invention will be fully understood from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1 is a plan of a signal-lamp case embodying my invention. Fig. 2 is a horizontal section of the same, taken at line 1 in Fig. 3. Fig. 3 is a section at line 2 in Fig. 2. Fig. 4 is a transverse section at line 3 in Fig. 2; and Fig. 5 is a plan of a ribbon-form light-coloring medium, illustrating a series of colored fields embodied in said medium and preferred to be employed in my invention.

Similar letters of reference refer to similar parts throughout the several views.

In the drawings, A is the case of the signal-lamp, adapted to inclose the operative parts of the lamp, which case may be of any preferred form of construction and made from any suitable material or combinations of materials preferred and may include one or more light-openings A′, so located in the case as to permit the light to be viewed from out one side, or from two opposite sides, or from the front, or from a side and the front, as may be found to be advantageous.

B is a suitable light, which may be produced from burning gas or oil; yet where an electric current may be conveniently supplied I would employ a suitable electric light from an electric lamp, as B′, within the case. This light is within the case and preferably central in the same and also preferably supported from above and so that when two or more light-openings are provided in the case this interior light may be opposite each of said openings, as shown.

C C are one or more magnifying-lenses in situation relatively exterior to the body of the case and at the outer ends of the respective tubes B^2, which serve as walls of the said light-openings. These lenses may be plain in both their opposite sides, or one side may be plain and the opposite side may be of any preferred corrugated form as may be preferred and as shown in Fig. 2. These lenses may be secured in place by any suitable means.

Preferably in the lower central end of case A is an opening E of a diameter suitable for a free passage into the chamber of the case A of a suitable framework F, which may be adapted to hold in place the several devices employed for supporting and operating the light-coloring mediums, and *g g* are suitable latching devices which are preferably pivoted on the base-plate of the said framework F and adapted to be moved into engagement with the keepers *f f*, Figs. 2 and 3. These latching devices are provided with finger-

pieces f' for moving said latches into engagement with said keepers f for securely holding the said holder locked in place within the case, or in the opposite direction for moving the latches out of engagement with the said keepers, so that the said holder may be removed therefrom when preferred. This base-plate G may be of any suitable form adapted to hold the several parts and devices in this holder in place for operation. Figs. 1 and 2 show this base-plate to be of circular form and having the transverse bar G' connected by their opposite ends to said base-plate, with openings H between for a vertical passage of air from below into and upward through the chamber of the case and thence out through openings H' above.

Suitable light-coloring mediums I, having their bodies of thin transparent material and colored by a suitable color-dyeing agent, are provided in this holder and are in between the interior light B and the exterior lenses C and directly opposite the light-openings A', so that each may be in alinement with both light B and a lens C, as shown in Fig. 2. Heretofore lenses of colored glass have been employed exterior to the body of the case inclosing the light, thereby obviating the use of colored mediums between the light and lenses, while also colored slides of glass in signal-lamps have been employed between the interior light and exterior lenses; but these colored slides were more or less opaque or only translucent in their substance and were of considerable thickness, so that the magnifying quality of the lenses could not develop to the eye of a beholder strong and pure-colored rays. I have found by actual use with exterior lenses of pure clear glass and an interior light that a thin tissue of fabric of transparent material which is colored by a suitable color-dyeing agent and suitably interposed between said interior light and exterior lens the latter greatly magnifies the field of the said light-coloring mediums I, of whatever color they may be, and that the light passing through the said medium is made to be brighter and more pure and strong in color to the eyes of a viewer.

The one or more light-coloring mediums between the light and exterior lenses may be of any suitable thin material through which rays of light may have passage to and through the lens in the mouth of the opening A. I at present prefer to produce the said light-coloring mediums from a thin flexible material through which rays from light B may have passage to the lens. I have found that loose woven fabrics from thin threads of wool, cotton, silk, and other material and thin transparent paper and thin sheet-celluloid are each well adapted for use as light-coloring mediums and that when these materials are colored by a suitable color-dyeing agent they color the rays from light B before their passage through the lens C, and as the area of the colored field is magnified and enlarged in appearance to the viewer so the colored rays in their area appear to be also enlarged, while the color of the rays will appear to be brilliant, pure, and readily recognizable by the viewer.

For changing the color of the rays from the central light B in their passage to the same lens to another strongly-contrasting color I make the light-coloring medium in the form of a ribbon from any of the above-mentioned flexible materials and with a width slightly greater than the diameter of the openings A' and with a length sufficient to comprise such a number of color-contrasting fields as may be required in service from time to time, as, say, three or more or less fields of colors, as red, green, blue, yellow, or any other color employed for signaling purposes. Fig. 5 shows a plan of this ribbon-form light-coloring medium, in which are shown four color fields, as red field J, green field J', yellow field J^2; yet other fields of color, as blue J^3, purple, or white may be added when preferred. These fields are made in length sufficient to receive the rays passing from light B to the one or more lenses which may be employed in the lamp for displaying colored-signal lights from their respective tubes A'. For convenience in moving this ribbon-form series of light-coloring mediums to and from position as is required for placing the respective color-fields between the lenses and light according to the color or colors to be displayed I provide any simple mechanism by which this ribbon of colored fields may be rolled up from one end and unrolled from the opposite end to any preferred distance, so as to carry a selected field of color to a place between the light B and lens C, that the light-rays may become colored in passing through the ray-coloring medium and be magnified in their appearance when viewed.

My preferred mechanism for moving into place the respective colored fields provided in this thin ribbon of light-coloring mediums consists of drums or rollers K, properly supported by suitable bearings, and preferably by ball-bearings $k\,k$, Fig. 3, and held each in place by central shaft k', preferably serving also as a coupling-bolt between the base-plate G and the top plate G^2 of the framework F. These drums or rollers K have with their lower ends gear-wheels K^2, which are actuated by driving-gear K^3, having its teeth working loosely in those of gears K^2 and having its shaft k^2 supported in a suitable bearing k^3 and adapted to be revolved at pleasure in either direction by means of a suitable hand-wheel K^4.

L L are suitable posts extending vertically from base-plate G up to top plate G^2 and in places at distances apart, so as to hold the color field or fields in straight lines and with their planes relatively at right angles to the axis of the exterior lenses which are to magnify the colored rays passing outward from said colored fields. These posts L are

preferably made so as to be adapted to freely revolve on a stationary post L', Fig. 3, so that the substance of the ribbon-form color medium may not be abraded or injured in its texture or surfaces. The outer ends of this thin ribbon of colored fields are properly secured to the drums or rollers K, so as to hold with them and yet to be removable therefrom at pleasure when required to be replaced by new ribbons of the same or different colored fields.

The portion of the chamber of this lamp between the burner and ribbon of light-coloring mediums may be ventilated for changing the air admitted to said chamber for carrying heat which may radiate from said burner upward to a suitable discharge from the upper end of said chamber, and thereby prevent the material of said ribbon from being affected by heat, as it otherwise might be were no ventilation had.

These above-described improvements are adapted to produce colored-signal lights of bright and uniformly same shade for use in signal-lamps for railroad-switches, conductors and trainmen's lanterns, and especially for signal-lamps of electric cars, and obviate the use of several different portable lamps or removable colored-glass plates, as heretofore required to be employed for changing signal-lights when required.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a signal-lamp, the combination with a case having in a vertical side thereof a viewing-opening, and a suitable glass forming a part of said case and filling said opening, and adapted to permit a view from outside of a color medium which is within the chamber of said case, of a framework which is removable, at pleasure, from the said case, two drums which are adapted to revolve, bearings that are supported from said framework and receive the journals of said drums, a thin ribbon-form coloring medium comprising two or more fields of contrasting color and connected by its respective ends to said drums, and mechanism adapted to revolve said drums at the same time and in the same direction, and so as to carry any one of said fields of contrasting color, in said ribbon-form coloring medium, between a source of light within the case and the glass closing the said viewing-opening.

2. In a signal-lamp, the combination with a case provided with two or more light-viewing openings, and a single source of light in said case and opposite each of said several light-viewing openings, of a magnifying-lens at the outer end of each of said light-viewing openings, and a thin ribbon-form coloring medium of the same color between said lenses, and said source of light, and means for moving said ribbon-form coloring medium in either direction.

3. In a signal-lamp, the combination with a case provided with one or more light-viewing openings and a source of light in said case and opposite each of said openings, of magnifying-lenses, respectively, in the outer ends of each of said light-viewing openings, and a thin ribbon-form light-coloring medium comprising two or more contrasting colors, between said source of light and the said lenses, and adapted to be moved in either direction in relation to the latter.

4. In a signal-lamp, the combination with a case, a source of light, and two or more light-viewing openings arranged to be opposite said source of light, of a magnifying-lens in the exterior ends of each of said light-viewing openings, a ribbon-form light-coloring medium, provided in its length with two or more fields of strongly-contrasting colors and adapted, respectively, to be moved at pleasure in either direction in relation to any preferred one or two of said lenses through which any selected color is to be preferably displayed.

5. In a signal-lamp, the combination with a case, a source of light and two or more light-viewing openings located at different places in the case and opposite said source of light, of magnifying-lenses in the outer ends of said openings, a ribbon-form light-coloring medium, which is provided in its length with two or more transparent fields of contrasting colors, and mechanism adapted to move said ribbon of transparent colored fields in either direction, at pleasure, between said source of light and each of said magnifying-lenses.

6. In a colored-signal lamp, the combination with a case provided with an opening for access to its chamber, and having one or more light-viewing openings, a magnifying-lens in the outer end of each of said openings and a source of light in said case, of a ribbon-holding mechanism adapted to be introduced into the said case, through said opening, and having in it the combination with a base and top plate, properly connected for supporting the operating parts, a pair of vertical drums, bearings supporting said drums, gears connected with said drums for revolving the same, a drive-gear for actuating said drum-gears, means for revolving said drive-gear, posts suitably supported at suitable points in relation to said vertical revolving drums, and a ribbon-form light-coloring medium, comprising one or more colored fields, and having its outer ends secured to said vertical drums and adapted to be moved, at pleasure, in either direction, between said source of light, interior in said case, and the respective magnifying-lenses, and in lines at right angles to the axis of the respective lenses, as set forth.

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