

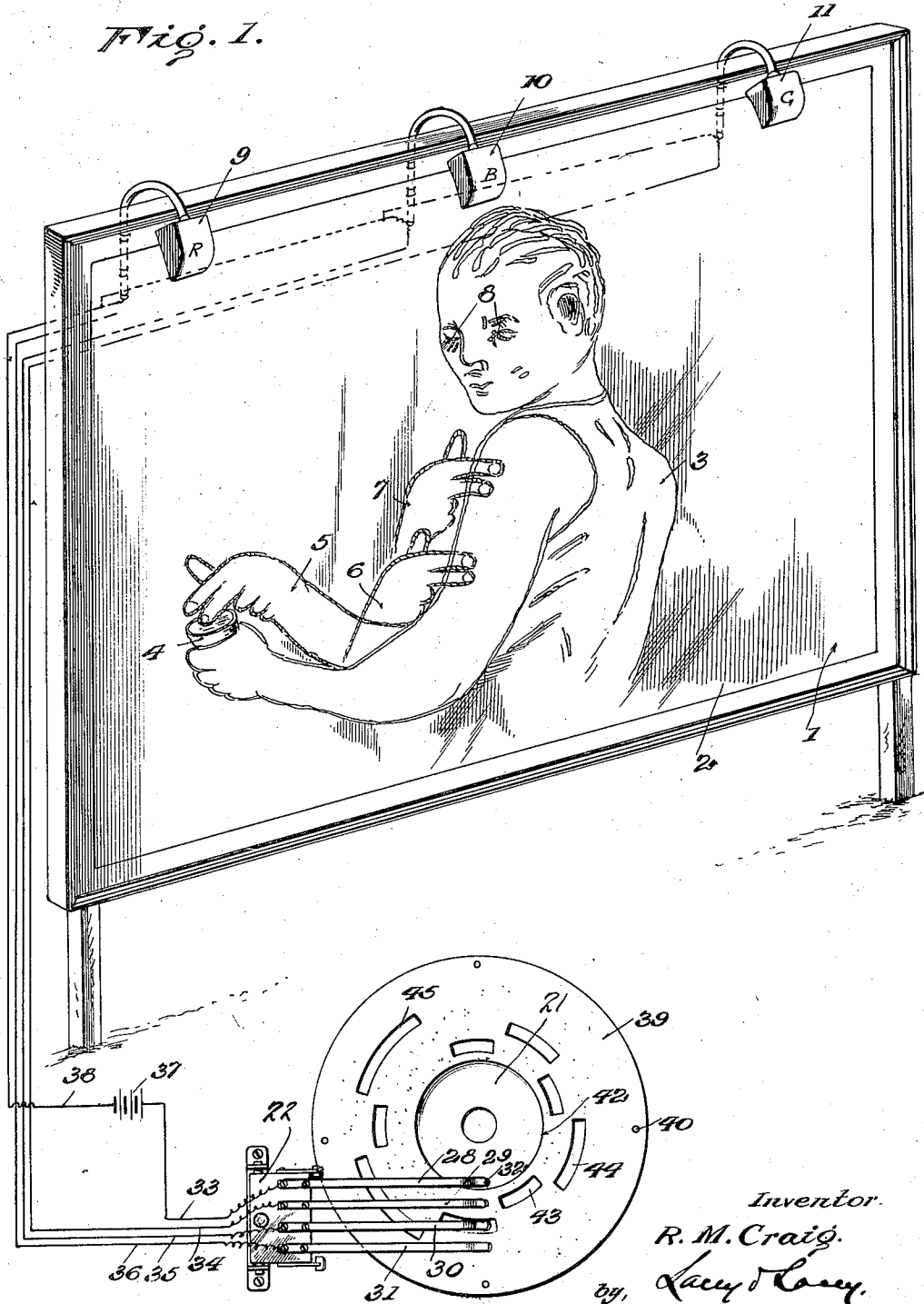
R. M. CRAIG.
ANIMATED SIGN.
APPLICATION FILED JUNE 11, 1919.

1,428,007.

Patented Sept. 5, 1922.

4 SHEETS—SHEET 1.

Fig. 1.



Inventor
R. M. Craig.
by *Lacy & Lacy*
Attorneys.

R. M. CRAIG.
 ANIMATED SIGN.
 APPLICATION FILED JUNE 11, 1919.

1,428,007.

Patented Sept. 5, 1922.

4 SHEETS—SHEET 2.

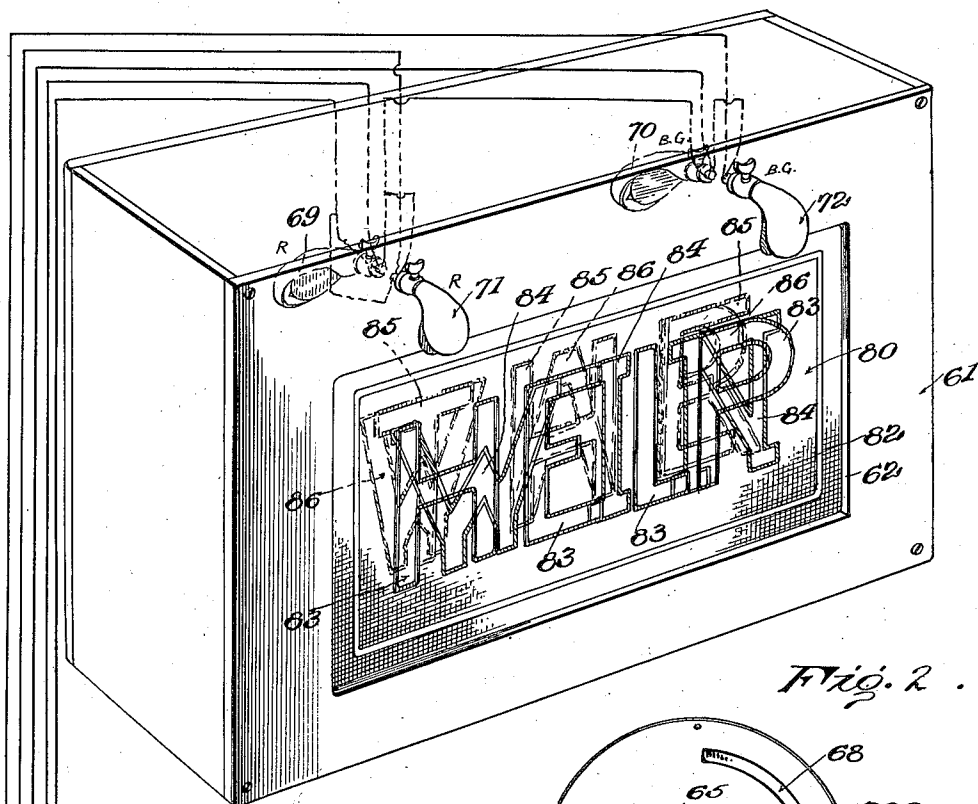


Fig. 2.

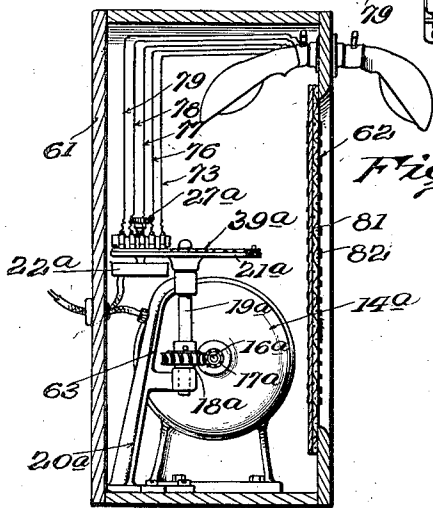
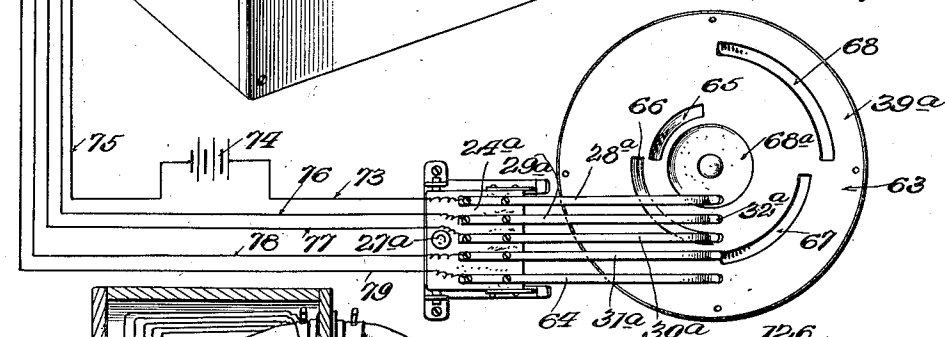


Fig. 3.

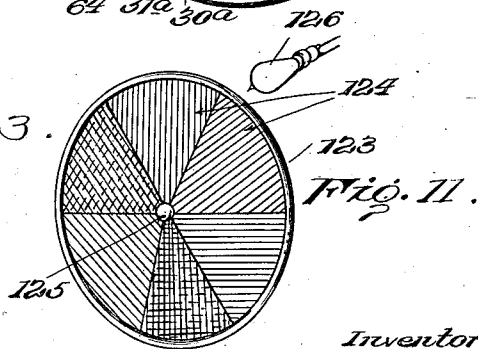


Fig. 11.

Inventor.
 R. M. Craig.
 by Lacey & Lacey,
 Attorneys.

R. M. CRAIG.
 ANIMATED SIGN.
 APPLICATION FILED JUNE 11, 1919.

1,428,007.

Patented Sept. 5, 1922.
 4 SHEETS—SHEET 3.

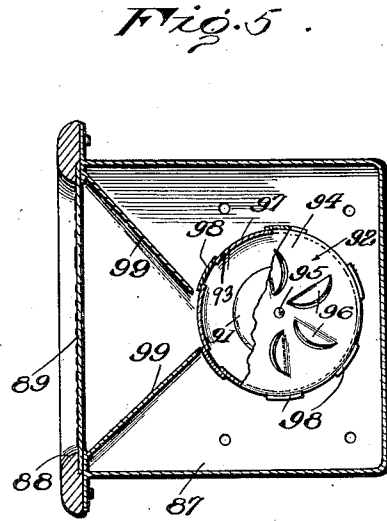
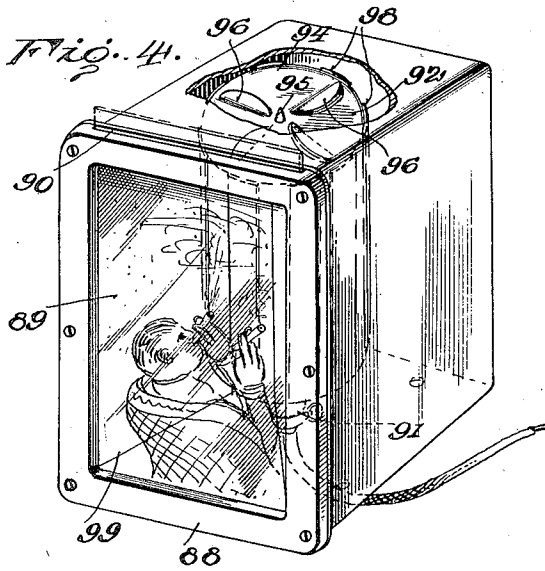
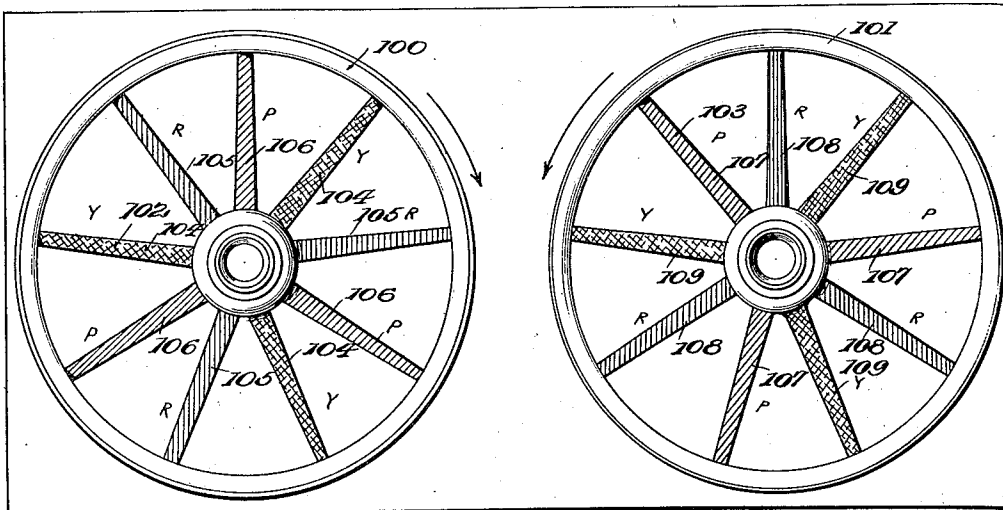


Fig. 6.



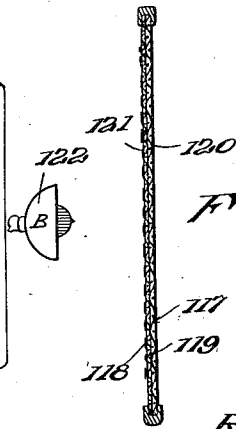
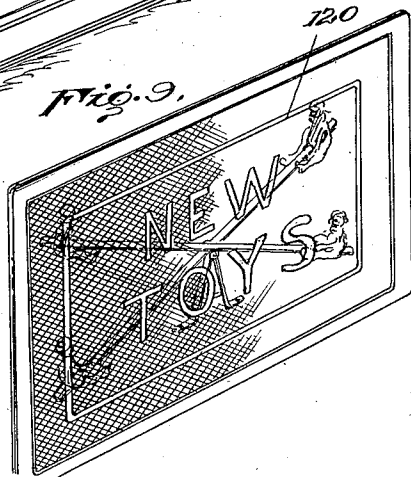
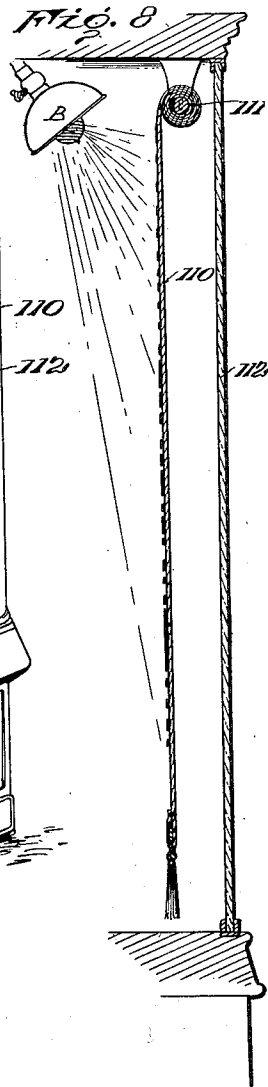
Inventor.
 R. M. Craig.

by *Lacey & Lacey,*
 Attorneys.

R. M. CRAIG.
 ANIMATED SIGN.
 APPLICATION FILED JUNE 11, 1919.

1,428,007.

Patented Sept. 5, 1922.
 4 SHEETS—SHEET 4.



Inventor
 R. M. Craig.
 by *Kearney & Kearney*
 Attorneys.

UNITED STATES PATENT OFFICE.

RICHARD M. CRAIG, OF SAN ANTONIO, TEXAS.

ANIMATED SIGN.

Application filed June 11, 1919. Serial No. 303,506.

To all whom it may concern:

Be it known that I, RICHARD M. CRAIG, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Animated Signs, of which the following is a specification.

This invention relates to advertising signs and more particularly to the animated type.

It is well recognized that the controlling factors in determining the value of an advertising sign as measured by its power to attract and hold attention are light, color, and animation. These factors separately employed in an advertising sign possess their individual degrees of attractiveness and it follows that the combination of all three factors in an advertising sign increases the attractive power of the sign to a much higher degree than the use of any one or two of the factors. In addition to the three factors mentioned above there is a fourth and extremely important factor, namely, mystification, and it is evident that where all four factors are present the attracting power of the sign embodying them is increased to a maximum degree. Heretofore various attempts have been made to utilize the factors of light and animation, frequently accompanied by the factor of color, in the production of advertising signs, recourse being had in most instances to the selective flashing of groups of electric light bulbs, so as to simulate motion, and in other instances to moving sign bands or other devices in which the motion is purely mechanical and so obviously such that this particular factor possesses little value as an attention attracting means. One requisite of an advertising sign is that the cost of installation, operation, and maintenance shall not be prohibitive, but it is a well known fact that most electrical display signs of the type above referred to are very costly, and it is no doubt a fact that in view of their inability to accurately portray motion, and the fact that they are so costly to install and maintain, their present rather extensive use would not be warranted except for the fact that up to the present time such a sign has been probably the most desirable one available. Another disadvantage presented by previously designed and employed animated signs is that almost invariably they must be of a permanent nature, that is to

say, the character of the advertising matter or the nature of the component parts of the sign which, in the operation of the sign, are to be given the appearance of motion, cannot be changed or varied without more or less complete reconstruction or reorganization of the sign. Furthermore, in the instance of a sign in which the object to which animation is to be imparted is outlined by electric light bulbs, the identity of the object cannot readily be recognized and thus the sign loses a portion of its value as an advertising medium.

In consideration of the foregoing it is the primary object of the present invention to expound a novel principle in accordance with which advertising matter may be displayed with the attendance of all of the four factors above mentioned, namely, light, color, animation, and mystification so that a sign constructed and operated in accordance with the principles of the invention will possess maximum value as an advertising medium inasmuch as it will attract and hold attention to a far greater degree than signs in which one or more of these factors is lacking.

Another object of the present invention is to provide an advertising sign constructed on such principles that the character of the advertising matter may be as frequently changed as desired at a minimum expense, and even new and wholly original advertising matter prepared by an inexperienced person, the change being effected merely by the substitution of one display surface for another.

Another object of the invention is to provide a sign the construction of which is based on such principles that much more startling and attractive effects may be obtained in its operation than by the use of signs many more times as expensive, the cost of installation, operation and maintenance of a sign constructed in accordance with the present invention being a minimum.

Another object of the invention is to provide for the construction of an advertising sign embodying the factor of animation and in which this effect is produced, partly through the method of displaying the images to which are to be imparted the appearance of animation, and partly through persistence of vision in a manner so lifelike and unmechanical as to introduce the factor of

mystification. Incidentally the invention contemplates a method of display by which the most minute details of the image or images to which the appearance of anima-
 5 tion is to be imparted, may be clearly brought out in every position of movement of every part of the image or images.

Another object of the invention is to provide means whereby the image or images
 10 of the sign will be displayed in such a manner as to give the impression of a relatively great number of different motions whereas as a matter of fact this result is obtained in an extremely simple manner and by a
 15 minimum number of change effecting units.

The majority of animated signs now in use require a display surface of a special construction and mounted in some special manner, whereas it is a further object of
 20 the present invention to display advertising matter by a method in which all of the four factors heretofore mentioned will be present and which advertising matter may be depicted upon practically any available sur-
 25 face, such, for example, as a signboard, brick wall, the side of a building or barn, a fence, window curtains, the canvas sides of wagons, theatre curtains, interior wall sur-
 30 faces, the sides of tents, etc., the only labor and expense involved comprising the painting of the advertising matter upon the display surface and the installation of a simple and very inexpensive illuminating means for said surface.

A further object of the invention is to provide for the display of advertising mat-
 35 ter in such a manner that any number of wholly distinct and independent signs may be operated through the employment of but
 40 a single flashing device in the circuit in which are located the light bulbs for illuminating the display surface.

A still further object of the invention is to construct, in accordance with the princi-
 45 ples of the invention, a sign useful in daylight as well as at night so that the sign will serve its purpose as an advertising medium whether or not it is displayed in the pres-
 50 ence of artificial light.

In another embodiment of the invention means is provided whereby, because of a novel arrangement of display surfaces, a
 55 maximum number of different and if desired independent signs may be successively displayed by the use of a minimum number of illuminating units, some of which are arranged to selectively display certain of the signs through the medium of reflected light and others to selectively display the
 60 other signs through the medium of transmitted light.

A further object of the invention is to provide for the display of a maximum
 65 volume of advertising matter upon a display surface having a minimum display

area, the invention contemplating the arrangement in superposed relation of as many as four different signs within the area of the display surface and the selective displaying of the individual signs.

In the accompanying drawings:

Figure 1 is a perspective view illustrating one embodiment of the invention, the view showing one form of animated sign in perspective and showing in a semi-diagrammatic manner the means for controlling the illumination of the display sign;

Fig. 2 is a view similar to Fig. 1 illustrating another embodiment of the invention, the sign in this form being constructed for the selective display of superposed advertising matter through the illumination of the display surface selectively by transmitted and reflected light;

Fig. 3 is a vertical front to rear sectional view through the sign shown in Fig. 2;

Fig. 4 is a perspective view illustrating a further modification of the invention;

Fig. 5 is a horizontal sectional view through the structure shown in Fig. 4;

Fig. 6 is a view in elevation illustrating another type of sign;

Fig. 7 is a perspective view illustrating the embodiment of the invention in a window curtain sign;

Fig. 8 is a vertical front to rear sectional view through the sign shown in Fig. 7;

Fig. 9 is a perspective view illustrating a combined daylight and night sign;

Fig. 10 is a detail sectional view through the sign shown in Fig. 9;

Fig. 11 is a view in elevation illustrating means whereby the display surface may be flooded selectively with light rays of different colors without the necessity of employing colored electric light bulbs.

The present invention is based on the principles involved in the property of selective absorption possessed by spectral colors and by experimentation I have evolved a method whereby, in taking advantage of this property, advertising matter may be displayed with startling results. For example, if, upon a white surface, two marks are drawn each in a color complementary to the other, and the surface is flooded with spectral light corresponding to the color of one of the marks, that mark will be absorbed and therefore obliterated or be rendered substantially invisible, whereas the other mark will be darkened so as to appear substantially black, and conversely if the surface is flooded with spectral light of a color corresponding to the color of the last mentioned mark, said mark will be rendered indistinguishable and the other mark will be darkened so as to appear substantially black. Thus if one of the marks is made in yellow and the other in blue and the surface is flooded with light of spectral blue

color, the mark in yellow will appear substantially black and the blue mark will be absorbed and become indistinguishable. and on the other hand if the surface is flooded with yellow light, the blue mark will appear substantially black and the yellow mark will be absorbed and become indistinguishable; and, so it is with all complementary colors. The foregoing applies to pairs of complementary colors but I have further made the discovery that there may be a more extensive use of complementary colors which, as will be presently fully explained, enables me to obtain much more startling results as concerns the factor of animation. Where a pair of complementary colors are employed the number of different movements which may be seemingly produced is necessarily somewhat limited but this number and the variety of movements may be greatly multiplied where more than two complementary colors are employed. Thus I have found that if a well balanced selection is made of a triad of colors and their respective complements, I am enabled to more correctly portray animation than by the employment of a single pair of complementary colors. Also I have discovered where the selection of triad colors and their complements is balanced each of the triad colors will absorb two of the complementary colors. For example arrangements may be made to successively flood a white display surface with the colors comprising the triad group embracing dark red, blue inclining to violet, and yellowish green. Upon the display surface marks may be made in the respective complements of these triad colors, namely, peacock green, yellow, and magenta. Now if the surface is flooded with red light, the mark in peacock green will seemingly appear black but the marks in yellow and magenta will be absorbed and rendered invisible; if the surface is flooded with the blue light, the mark in yellow will seemingly appear black and the marks in peacock green and magenta will be absorbed; and, if the surface is flooded with green light, the mark in magenta will seemingly appear black and the marks in peacock green and yellow will be absorbed. Thus each of the triad colors constitutes a medium for absorbing the complements of the other two triads of the group. Of course, there are many different triad groups of colors and their complements which may be made use of so long as each color of the triad group is capable of absorbing the complements of the other two colors of the group.

I will now proceed to a description of various embodiments of my invention, but before doing so I wish to emphasize the fact that what is illustrated in the drawings and hereinafter specifically described is to be considered only as representative of some of

the many ways in which the principles of my invention may be utilized, and that while I consider each of the illustrated embodiments of the invention to be entirely practicable, and so far as their individual structural features and attendant advantages are concerned are meritorious, there are many other equally practicable and meritorious arrangements which may be effected without departing from the invention and which are consequently intended to be covered by such of the claims as are of a scope to include the same.

Figure 1 illustrates a very satisfactory embodiment of the invention designed especially for use where advertising matter is to be displayed upon a billboard, a fence, the side of a building, or upon any similar surface. In this particular instance the sign is to advertise a salve by an ingenious representation of a man in the act of using the salve, the operation of the sign giving the impression of the required movements being made to apply the salve to the arm and then rub the same into the arm. In the said figure the numeral 1 indicates in general a sign-board having a display surface which in the present instance will be white and which is indicated by the numeral 2. Upon this surface there is painted or otherwise depicted, by suitable coloring fluids, the image of the upper portion of the body of a man having his left arm bared as for the application of the salve and having his right arm represented in three different positions as will be presently more specifically explained. All portions of the image which are to maintain a fixed position or, in other words, appear as if motionless in the operation of the sign, may be painted in black or any other color which will not be absorbed by any one of the triad colors. For example the image of the man's head, neck, trunk, and left arm may be painted in outline or solid in black as indicated by the numeral 3, the numeral 4 indicating the representation of a jar of salve held in the left hand and this representation being also in black as in the operation of the sign the jar is to have no semblance of motion. The right arm is depicted in three positions one indicated by the numeral 5, another by the numeral 6, and the third by the numeral 7. The image 5 of the right arm is painted for example in yellow in a position representing two fingers of the right hand in the act of removing a quantity of salve from the jar 4. The image 6 is painted in magenta and represents the right arm and hand in such position that the said two fingers of the right hand will appear as if bearing upon the upper side of the arm near the elbow. The arm in the position 7 is painted in peacock green and is in a position representing the application of the said two fingers of the

right hand at the upper side of the right arm near the shoulder. All three positions of the right arm are painted by the use of transparent coloring fluids and I have found that no care whatsoever need be exercised in avoiding overlapping of the three positions whether painted solid or in outline as the selective absorption of the colors in the operation of the sign is perfectly accomplished notwithstanding an overlapping of the images. However, where the images of the fingers of the right hand overlap the image of the left arm, the overlapped portion of the image of the left arm may be depicted in a color which is a complement to the color in which is depicted the image of the fingers of the right hand which overlap the respective portion of the image of the left arm. For a purpose to be presently explained, the eyes of the image, indicated by the numeral 8, are depicted in one color, as for example yellow, as though looking directly at the jar 4, in another color for example peacock green as though looking at the shoulder of the left arm; and, in a third color for example magenta as though looking in the direction of the elbow.

The numerals 9, 10 and 11 indicate electric light bulbs which are arranged upon the sign-board 1, in the present instance at the top thereof, so as to flood the sign-board with light and these electric lights are colored respectively dark red, blue inclining to violet, and yellowish green.

By an automatic circuit closing means the lights 9, 10 and 11 are flashed on and off in such sequence and at such intervals as to so illuminate the image painted upon the sign-board as to convey the idea of animation. For example, the blue light 10 will be first flashed onto the board whereupon the right arm in the position 5 will appear as though in black, the positions 6 and 7 being absorbed by the blue light and consequently being invisible. Thus in the first position it will appear as though the man is removing a quantity of salve from the jar 4 with the fingers of his right hand. The sign is next flooded with red light thus immediately absorbing the images 5 and 6 and leaving the image 7 apparently in black. Due to persistence of vision, this change in color will give the impression of movement of the right arm from the position 5 to the position 7 so that it will appear that the salve removed from the jar 4 is applied by the fingers of the right hand to the left arm near the shoulder. In the meantime the eyes 8 have been so illuminated that in the first instance they will glance toward the jar 4 and in the second instance will glance toward the fingers which are laid upon the left shoulder in the position 7 of the right hand and arm.

The sign may next again be flooded with blue light whereupon the right arm will

apparently return to the jar for the removal of an additional quantity of salve. After a suitable interval the sign will be flooded with the green light whereupon the images 5 and 7 of the arm will become invisible and the image 6 will appear as if in black. In this instance, due to persistence of vision, the right arm and hand will apparently immediately move from the position 5 to the position 6 so that it will appear as though the salve removed from the jar is applied to the left arm near the elbow. Then the sign will be immediately rapidly alternately illuminated in red and green so that the images 6 and 7 will be alternately caused to disappear and to appear as though in black and through persistence of vision the impression received will be that of the right hand and arm moving rapidly up and down the left arm as though in the act of rubbing the salve into the arm. In this latter mode of flashing, the eyes will apparently follow the rubbing motion of the right hand.

As heretofore stated, the illumination of the sign is automatically accomplished, and one means whereby this result may be obtained is illustrated in a general way in the said Fig. 1. This particular means which will now be described, possesses many advantages, is inexpensive to install and operate, and I have found it to be entirely practicable. However, as before stated, this means may be modified or even entirely replaced by some other means so far as concerns the general principles of the invention.

The flashing mechanism above referred to may or may not be mounted within a casing, as desired.

In the form shown in Fig. 1 a table of some suitable metal which is a good conductor of electricity and rotated in any desired manner serves as one part of a master circuit-closing device. A block 22 of any suitable insulating material is supported for swinging movement and the numerals 28, 29, 30 and 31 indicate four spring contact fingers which are secured in any suitable manner to the upper face of the block and have their ends slightly bent upwardly as indicated by the numeral 32 so as to provide rounded under surfaces to insure of smooth contact with the table as the table rotates beneath the said terminals. The terminals 32 of the fingers are located in a common line radial to the axis of the table 21 as clearly shown in Fig. 1 of the drawings. Conductor wires 33, 34, 35 and 36 are electrically connected with the contact fingers 28, 29, 30 and 31 respectively, and the said wires 34, 35 and 36 lead respectively to the light bulbs 11, 10 and 9. The wire 33 leads from the finger 28 to a source of current supply shown

diagrammatically in Fig. 1 and indicated by the numeral 37, and a common return wire 38 is electrically connected with the lamps 9, 10 and 11 and with the said source of supply 37.

The invention contemplates the provision of means rotating with the table 21 whereby the fingers 29, 30 and 31 may be in a definite order, brought into circuit or bridged with the finger 28, and this may be accomplished through the provision of a disk 39 adapted for disposal upon the upper face of the table 21 and held for rotation therewith. In its central portion the disk is formed with an opening 42 through which the terminal of the contact finger 28 rests in electrical contact with the exposed portion of the table 21 at all times. Annular series of slots 43, 44 and 45 are formed in the disk 39, which disk is of insulating material, these slots in the rotation of the disk 39 with the table 21, being designed to pass respectively beneath the fingers 29, 30 and 31. As the finger 28 is at all times in electrical contact with the table 21 and the said table is in the nature of an electrical conductor, when each of the slots 43 passes beneath the finger 29, the circuit will be closed through the green lamp 11; when each slot 44 passes beneath the finger 30, the finger will make contact with the table 21 and the circuit will be closed through the blue lamp 10; and, when each slot 45 passes beneath the terminal of the finger 31 the said finger will make contact with the table and the circuit will be closed through the red lamp 9. By regulating the lengths of these slots and properly positioning them with relation to each other, the simple rotation of the disk 39 beneath the terminals of the contact fingers will serve to so regulate and determine the lengths and frequency of the periods of flashing on of the lights 9, 10 and 11 as to produce the effect of animation in the manner heretofore pointed out.

It will be understood, of course, that various images may be painted upon the face of the signboard 1 and may, through the flashing of the lights 9, 10 and 11, be seemingly caused to go through various motions. It will also be understood that while but three lights or three sets of lights are employed, a greater number of motions may be simulated by varying the order and period of flashing of the lights. For example, taking the lights 9, 10 and 11, these lights may be flashed in twelve different ways successively in the following combinations: 9 and 10; 9 and 11; 9, 10 and 11; 9, 11 and 10; 10 and 9; 10 and 11; 10, 9 and 11; 10, 11 and 9; 11 and 9; 11 and 10; 11, 9 and 10; and, 11, 10 and 9. These variations in the order and period of flashing will, of course, be brought about by a suitable relative positioning of the slots in

the disks 39, each sign to be displayed having its own particular master disk, so as to permit of the ready and quick adaptation of the circuit closing or flashing mechanism for the display of any selected one of a number of signs. For example, the display surface of the board 1 might be separable from the board so that, being provided with a number of such surfaces each bearing a different type of advertising matter or different images, one surface could be substituted for another at any desired intervals of time without any great difficulty or labor, and the substitution of the master disks 39 one for another could be readily and practically instantaneously effected.

As heretofore stated, where two complementary colors only are employed, the possible changes or variations in movement of the sign characters or images are somewhat limited, but this statement is intended to apply more particularly to an arrangement wherein for example two positions of an image are painted upon a display surface and the said positions are alternately displayed and absorbed either by transmitted or reflected light. I have discovered, however, that by the use of a diffractive medium the number of changes or variations may be doubled, with the employment of two colors, and may be trebled or even further multiplied by the employment of three colors. Figs. 2 and 3 of the drawings illustrate an embodiment of the invention in which this newly discovered principle is embraced, the illustrated embodiment making use of two colors. In the said figure the numeral 61 indicates in general a casing having an open front 62. A flashing mechanism substantially identical with that described in connection with the form of the invention shown in Fig. 1 of the drawings, and indicated in general by the numeral 63, is arranged within the casing 61, the only feature of difference residing in the provision of a fifth contact finger indicated by the numeral 64 and provided in addition to the fingers 28, 29, 30 and 31 heretofore described. Parts of the flashing mechanism shown in Figs. 2 and 3 of the drawings which correspond to parts of the flashing device illustrated in Fig. 1, are indicated by like reference numerals with the addition of the suffix "a". In this form of the invention, inasmuch as there is provided the additional contact finger 64, the master circuit closing disk is likewise provided with four separate arcuate contacts or slots as the case may be, or four distinct series of such contacts or slots. Assuming that the disk is provided with contact strips upon its face, one of these strips is indicated by the numeral 65, another by the numeral 66, a third by the numeral 67, and the fourth by the numeral 68, the disk having a central opening 68^a through which the terminal of 1

the contact finger 28^a may enter to contact with the upper face of the table 21^a which supports the said disk. The contacts 65, 66, 67 and 68 are designed to pass respectively
 5 beneath the contact fingers 29^a, 30^a, 31^a and 64. Mounted within the casing are one or more bulbs 69 of a selected color such for example as red, and one or more bulbs 70 of
 10 a complementary color such for example as blue green. Corresponding red and blue green bulbs 71 and 72 are mounted upon the exterior of the front of the said casing. The display surface of the sign is to be arranged within the open front 62 of the casing, and
 15 the bulbs 69 and 70 are arranged to flood the surface with light from the rear while the bulbs 71 and 72 are arranged to flood the surface with light from the front. A conductor wire 73 leads from a source of current
 20 supply indicated by the numeral 74, to the contact finger 28^a and another conductor wire 75 leads from the said source 74 to each of the four bulbs 69, 70, 71 and 72. Conductor wires 76, 77, 78 and 79 lead respectively
 25 from the contact fingers 29^a, 30^a, 31^a and 64 to the bulbs 69, 70, 71 and 72 respectively. At this point it will be understood and particularly by tracing out the circuit shown in Fig. 2 of the drawings, as the disk
 30 39^a rotates in an anti-clockwise direction or, in other words, to the left in the said figure, the contacts 68, 67, 66 and 65 will successively ride beneath the contact fingers 64, 31^a, 30^a and 29^a so that the lights 72, 71, 70
 35 and 69 will be successively flashed on and extinguished.

The display surface or medium in this form of the invention, indicated in general by the numeral 80, comprises a sheet 81
 40 preferably of translucent material such, for example, as a sized cloth white in color, and a sheet 82 of some material which will act as a diffractive medium, such for example as cheese-cloth, screening, China silk or
 45 the like. The two sheets 81 and 82 are placed face to face in the manner shown in Fig. 3 of the drawings, within the opening 62, and upon the inner face of the sheet 81 or, in other words, that face which is presented toward the interior of the casing 61, there are painted or otherwise depicted two advertisements, or two positions of one or more images and these impressions may be overlapped to any desired extent. Like-
 50 wise upon the outwardly presented face of the sheet 82 there are depicted two positions of one or more images or two kinds of advertising, etc., which may also be arranged in overlapped relation to any desired extent, transparent coloring fluids being employed in both instances, and in the latter
 55 instance the fluid being preferably applied to the sheet 82 by an air brush or by any other means which will serve to apply the
 60 color to the outer side only of the said sheet
 65 as it is not desirable that the color reach the other side or face of the sheet either through absorption or otherwise. For example, in the illustrated embodiment of this form of the invention, the two words "Help" and
 70 "Win" are arranged in superposed relation upon the outer face of the sheet 82, the letters of the word "Help", indicated by the numeral 83, being red in color and the letters of the word "Win," indicated by the
 75 numeral 84, being blue green in color. Upon the inner face of the sheet 81 there are arranged in superposed relation the letters "The", indicated by the numeral 85, and "War", indicated by the numeral 86, the
 80 letters of the first appearing in red and the letters of the latter in blue green. In the operation of the sign the lamp 72 will be first flashed on thus flooding the face of the display surface with blue green light which
 85 will be reflected back from the outer face of the sheet 81 and through the diffractive sheet 82 absorbing the blue green letters comprising the word "Win" and causing the letters comprising the word "Help" to
 90 appear apparently in black. The light 71 will next be flashed on, the light 72 being simultaneously turned off and as the display surface will then be flooded with red light the letters of the word "Help" will be absorbed and the letters of the word "Win" will be brought out substantially in black. As the light 71 is extinguished the light 70 will be flashed on, thus flooding the inner
 95 face of the display surface with blue green light which being transmitted through the sheets 81 and 82 will absorb the letters of the word "War" and bring out the letters of the word "The" apparently in black. Finally as the light 70 is extinguished, the
 100 light 69 will be flashed on, flooding the display surface with red light which will absorb the letters of the word "The" and bring out the letters of the word "War" apparently in black. It will be evident from the
 105 foregoing that the rays from the lamps 72 and 71 will be transmitted by reflection through the diffractive screen or sheet 82 thus bringing out the letters of the words upon this sheet, but when the lamps 70 and
 110 69 are flashed on in turn, the light rays will be transmitted through the sheet 81, bringing out the letters of the words upon the said sheet but not displaying the letters of the words upon the sheet 82 owing to the
 115 diffractive nature of this sheet.
 The operation of this form of the invention is based on the discovery made by me that transmitted light rays passing first through the sheet 81 and then through the
 120 sheet 82, will completely wash out or render invisible the lettering or the like in both colors upon the said sheet 82 due to the diffractive nature of the material comprising the said sheet whereas light rays re- 130

flected from the face of the sheet 81 and passing through the sheet 82 will serve to clearly bring out the words or the like upon the said sheet 82 through selective color absorption. There are probably many materials which I might employ in producing the sheet 82 and consequently I am not to be limited to the specific materials above mentioned.

10 As concerns this embodiment of the invention, it will be understood that the display of words or similar character groups is to be taken only as illustrative of one mode of application of the principles displayed by the said embodiment, for by following the same principle at least four different movements of a part of an image may be exemplified, by painting two positions upon the sheet 81 and two positions upon the sheet 20 82. Also it will be understood that instead of employing two complementary colors, three triad colors and their complements may be employed in accordance with the principles involved in the first described form of the invention. In brief, the embodiment of the invention shown in Figs. 2, and 3 of the drawings involves the principle of displaying successively two or more kinds or positions of characters or images or the like by transmitted light through a translucent display medium which constitutes also a reflecting surface, and displaying two or more additional kinds or positions of characters or images or the like by light 35 reflected through a diffractive medium from the reflecting surface of the first mentioned medium, through the employment of diad or triad colors and their complements.

In the previously described embodiments of the invention, I make use of a flashing device which is more especially designed for the display of relatively large surfaces but where small display surfaces are to be exhibited, I may make use of the flashing device shown in Figs. 4 and 5 of the drawings and which device is much simpler in its construction and therefore much less expensive than the flashing device described in connection with the first two embodiments of the invention. In the said Figs. 4 and 5, the numeral 87 indicates in general a casing having an open front 88 within which is arranged a display medium preferably in the nature of a sheet 89 of any suitable material having printed, painted, or otherwise depicted upon it two or more positions of an image as for example that of a man smoking, one position representing the man drawing upon the cigar or cigarette and the other position illustrating the hand supporting the cigar or cigarette away from the mouth. If 60 desired one position of the image may be depicted upon one face, as for example the outer face, of the plate or sheet 89 and the other position upon the other or inner face

of the said plate or sheet so that the sign will possess value as an advertising medium in the daytime as well as at night, inasmuch as in the daytime a complete image of the smoker in one position would be visible. 70 Where the display is to be effected through the employment of two complementary colors, of course, two positions of the image of the smoker will be depicted, but if three colors are to be made use of, three positions of the image may be depicted, as for example, one representing the smoker in the act of drawing upon the cigar or cigarette, another in another color representing the smoker supporting the cigar or cigarette 80 away from his mouth, and a third in another color illustrating the smoker blowing the smoke from his mouth. It is preferable that the plate or sheet 89 comprising the display medium be removable through a slot 85 90 in the top or one side of the casing 87 so that any number of such plates or sheets bearing different advertisements may be readily substituted one for another, this embodiment of the invention therefore recommending itself especially for adoption by merchants doing business on a small scale, for display in windows or within their stores or shops. In order that the display medium above described may be flooded with lights 95 of different colors at the proper intervals, a simple means is provided which will now be described. The numeral 91 indicates an electric light bulb which is supported vertically within the casing 87 preferably upon a suitable base upon the bottom of the said casing, and rotatably supported upon this bulb is a heat motor or mill indicated in general by the numeral 92. This mill comprises a cylindrical body 93 and a top 94 105 provided centrally with an indentation 95 providing a socket in its under side to rotatably fit the usual pointed nib at the outer end of such a bulb so that the body is rotatably supported in this manner upon the 110 bulb. The top 94 of the body is further formed with incisions providing vanes 96 which are struck up so that the heated air currents rising within the body and passing through the openings formed by stamping 115 out these vanes, will act against the vanes to impart rotary motion to the body. At suitable intervals in its circumference, the body 93 is formed with vertically extending slots or openings 97 in which are arranged panes 120 98 of glass gelatine, or other suitable material of complementary colors or triad colors depending upon whether the display medium is to be illuminated on the two color or three color principle. In order that all 125 light may be excluded from the display medium except the light passing through a single pane at a time, partition plates 99 are secured at their forward edges at the opposite sides of the front of the casing and 130

are disposed in vertical planes converging in the direction of the inner edges of the said partition plates, the said edges of the plates terminating close to the surface of the body 93. Of course in this form of the invention as the heat motor or mill rotates, the panes 98 will be successively brought opposite the space between the inner edges of the partition plates 99 and the light rays will pass from this space to the display medium 89 and will flood the same with light of one color or another so as to selectively absorb all except one of the positions of the image upon the said medium.

In Fig. 6 of the drawings there is illustrated another embodiment of the invention exemplifying another startling result which may be obtained by following the three color principle. In this figure the numerals 100 and 101 indicate either two fixed wagon wheels or a painted image of two wagon wheels, and in the instance of the wheel 100, the spokes indicated by the numeral 102 are colored successively yellow, red and purple throughout the entire number or series of spokes. In the instance of the wheel 101, the spokes indicated by the numeral 103 are successively colored purple, red and yellow. Thus in the first instance the spokes indicated by the numerals 104, 105 and 106 will be respectively colored yellow, red and purple and in the latter instance the spokes indicated respectively by the numerals 107, 108 and 109 are colored purple, red and yellow. In this embodiment of the invention, when two wheels or the painted images thereof are simultaneously flooded successively with the complements of the three primary colors red, yellow and purple, the wheels will appear to rotate in opposite directions. In thus successively flooding the wheels or their images with the complementary colors of the triad group mentioned, any suitable flashing device may be employed as, for example, the flashing device first described in connection with Fig. 1 or a device adapted to successively project light rays in the colors complementary to the purple, red and yellow.

Figs. 7 and 8 of the drawings illustrate another embodiment of the invention especially designed for window display and in this form of the invention the display surface or medium is embodied in a window curtain or shade indicated in general by the numeral 110 and wound upon the usual roller 111 so that the shade may be raised in the daytime and drawn downward at night, it being positioned within a display window 112 in the manner clearly shown in the said figures. Assuming that this embodiment is to be operated on the three color principle, three electric light bulbs are arranged within the display window rearwardly of the

upper portion of the window curtain 110, one of these lights, as for example, a red light being indicated by the numeral 113, another, as for example, a blue light being indicated by the numeral 114 and the third a green light being indicated by the numeral 115. When the sign is in operation during the night these three lights are to be successively flashed on and off in any desired sequence and at any desired intervals, as for example by the employment of a flasher described in connection with the form of the invention illustrated in Fig. 1 of the drawings. In the illustrated embodiment of the invention the advertising matter to be displayed, as for example, the image of a person drinking at a soda fountain, and indicated by the numeral 116, is printed or painted upon the inner side or face of the shade or curtain 110, different positions of the image being painted in different colors complementary to the colors red, blue and green and the said complementary colors being so balanced that any one of the triad colors red, blue and green will absorb two of the said complementary colors. Thus three positions of the person drinking at the fountain may be depicted and if desired three positions of the fountain attendant, and consequently when the shade is drawn down and the sign is in operation, the images will appear to be in motion and the effect will be startlingly lifelike. As window shade rollers are readily demountable from their brackets, it will be understood that a number of curtains or shades may be provided and substituted one for another at any desired intervals as, for example, daily or weekly.

Reverting to the principles involved in the embodiment of the invention shown in Figs. 2 and 3 of the drawings, I have discovered a novel way in which a sign may be produced useful in daylight as well as at night. This embodiment of the invention is shown in Figs. 9 and 10 of the drawings and in these figures the display medium, indicated in general by the numeral 117, comprises a sheet 118 of translucent material and a diffractive sheet 119 of any suitable material such as that heretofore mentioned. Upon the outer face of the diffractive sheet 119 may be painted as for example in black, any desired advertising matter, as indicated by the numeral 120, and in two or three colors there may be painted upon the back of the sheet 118, as indicated by the numeral 121, two or more advertisements, overlapping images, or positions of an image or two or more images. The numeral 122 indicates one of two or more lights which are employed in the manner heretofore described for flooding the display medium 117, from the rear, successively with lights of colors complementary to the colors in which

the signs or images 121 are painted. In the operation of this sign, when the sign is being displayed in daylight, the white light reflected from the surface of the sheet 118 will bring out clearly the advertising matter upon the sheet 119. When the sign is being displayed at night, the transmitted light rays passing through the sheet 118 and thence through the sheet 119, will, however, wash out the advertising matter upon the said sheet 119 and render the same invisible. Thus there is no interference whatsoever of the advertising matter upon one sheet with that upon the other sheet.

Fig. 11 of the drawings illustrates a means which may be conveniently employed for flooding various types of display surfaces with light rays of different colors, and in this figure the numeral 123 indicates a circular frame in which are mounted segmental panes 124 of glass or other suitable transparent material of different colors, the frame being centrally mounted as at 125 for rotation, and a source of white light as, for example, an electric bulb 126 being placed behind the frame in such position that in the rotation of the frame the panes 124 will be successively brought into position for the transmission therethrough of light rays from the lamp 126.

In the claims I will refer to the display surface as bearing different matters to be displayed and by the expression "different matters" I mean wholly different and independent advertisements, successive follow up portions of a single advertisement, letters, numerals, characters of any kind, wholly different images, different positions of the same image, different shapes of the same image, different sizes of the same image, different conditions of the same image, and in fact any different matters of different or the same kind and whether relatively separated or partly or wholly superposed. Also in the claims where I refer to different colors, I mean colors capable of selective absorption, and not black and white, unless otherwise stated. Also in the claims where I refer to a display surface I intend this term to cover any surface suitable for the purpose, whether opaque, translucent, transparent, or of a diffractive nature. Furthermore, in the claims where I refer to means for displaying the surface in the presence of a light medium, I contemplate the employment of any means whatsoever suitable for the purpose of flooding the surface with light, under the qualifying conditions recited in the claims.

Having thus described the invention, what is claimed as new is:

1. A display apparatus including a display surface bearing, in more than two different colors, different matters to be displayed, and means for successively displaying said surface in the presence of light media of colors

different from those first mentioned and each capable of being absorbed by all but one of said colors.

2. A display apparatus including a display surface bearing, in different colors, more than two different matters to be displayed, and means for successively displaying said surface in the presence of light media of colors different from those first mentioned and complementary thereto and each capable of being absorbed by all but one of said colors whereby to selectively successively display said matters.

3. A display apparatus including a display surface bearing, in more than two different colors, different matters to be displayed, and means for successively displaying said surface in the presence of light media of colors different from those first mentioned and each complementary to one of said colors and capable of being absorbed by the remaining colors.

4. A display apparatus including a display surface bearing, in more than two different colors, an image of more than two different positions of a moving part, and means for successively displaying said surface in the presence of light media of colors different from those first mentioned and complementary thereto and each capable of being absorbed by all but one of said colors, whereby to successively display the images of the different positions of the said part.

5. A display apparatus including a display surface bearing, in more than two different colors, images of more than two different positions of a part, and means for displaying said surface in the presence of an equivalent number of light media of colors different from those first mentioned and each complementary to one of said colors and capable of being absorbed by the remaining colors.

6. A display apparatus including more than two representations of movable objects, respective moving elements of each object in the representation being represented in different colors in a predetermined sequence, the corresponding elements of the object in the other representation being represented in the same colors in another sequence, and means for displaying the representations in the presence of light media of colors different from those first mentioned and complementary to one of said colors and non-complementary to another of said colors.

7. An animated sign display apparatus including a display surface upon which are depicted, in different colors, different positions of an image, and means for automatically displaying said surface, at irregular intervals in the presence of light media of different colors, each capable of being absorbed by one of the colors of the display surface, whereby to selectively display the

different positions of the image for different periods of time and thus effect the appearance of irregular motion of the parts of the image.

5 8. An animated sign display apparatus including a display surface bearing, in different colors, different positions of an image, and means for automatically displaying said surface, at irregular intervals and for un-
10 equal periods of time, in the presence of light media of different colors each capable of being absorbed by one of the colors of the display surface, whereby to selectively display the different positions of the image
15 for different periods of time and thus effect the appearance of irregular motion of the parts of the image.

9. An animated sign display apparatus including a display surface bearing, in more
20 than two different colors, different positions of an image, and means for automatically displaying said surface, at irregular intervals, in the presence of a corresponding number of light media of different colors
25 each capable of being absorbed by all but one of the colors of the display surface, whereby to selectively display the different positions of the image for different periods of time and thus effect the appearance of ir-
30 regular motion of the parts of the image.

10. An animated sign display apparatus comprising a sign surface bearing, in different colors, different positions of an image

to which, aided by persistence of vision, the appearance of animation is to be imparted, 35 and means for displaying said surface in the presence of light media of different colors at intervals and for periods of different duration consonant with the movements to be portrayed, each of the said color media 40 being capable of being absorbed by one of the colors in which the image is depicted.

11. A display apparatus including a display surface bearing, in triad colors, differ- 45 ent matters to be displayed, and means for successively displaying said surface in the presence of triad color light media different from the colors first mentioned and complementary to the first mentioned triad colors and capable of being absorbed by two of said 50 first mentioned colors.

12. A display apparatus including a display surface bearing, in triad colors, an im- 55 age of three different positions of a moving part, and means for successively displaying said surface in the presence of triad color light media different from the colors first mentioned and complementary to the first mentioned triad colors and capable of being 60 absorbed by two of said first mentioned colors whereby to successively display the images of the different positions of the said part.

In testimony whereof I affix my signature.

RICHARD M. CRAIG. [L. s.]