

1,219,731.

E. HALL.
PLURAL IMAGE DEVICE.
APPLICATION FILED JUNE 1, 1915.

Patented Mar. 20, 1917.

2 SHEETS—SHEET 1.

FIG. 1.

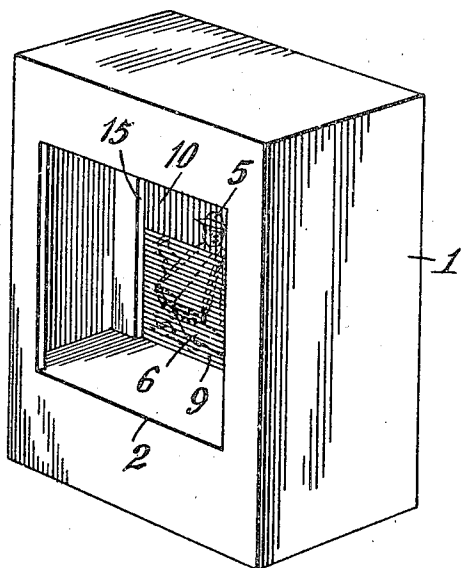


FIG. 2.

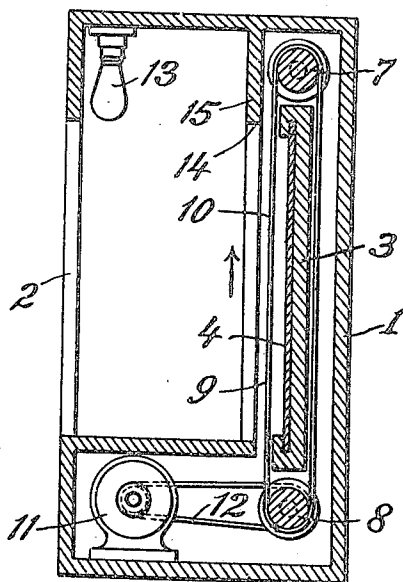


FIG. 3.

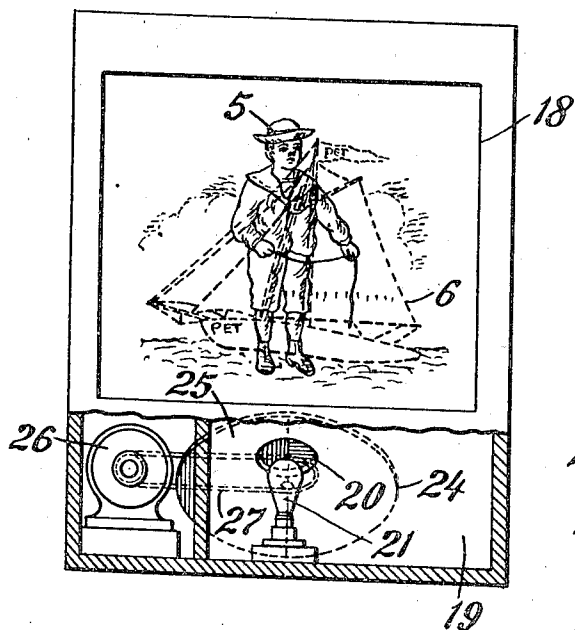
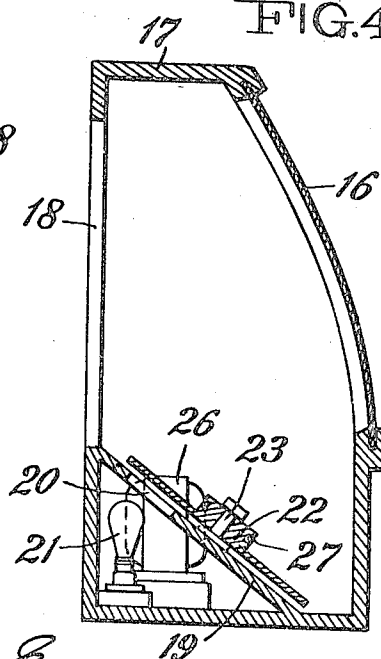


FIG. 4.



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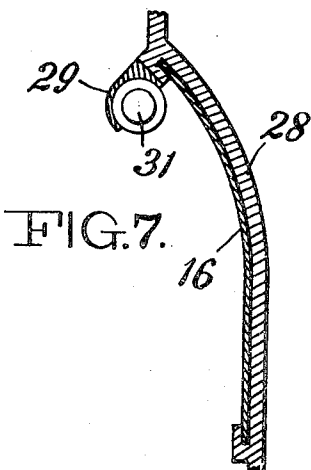
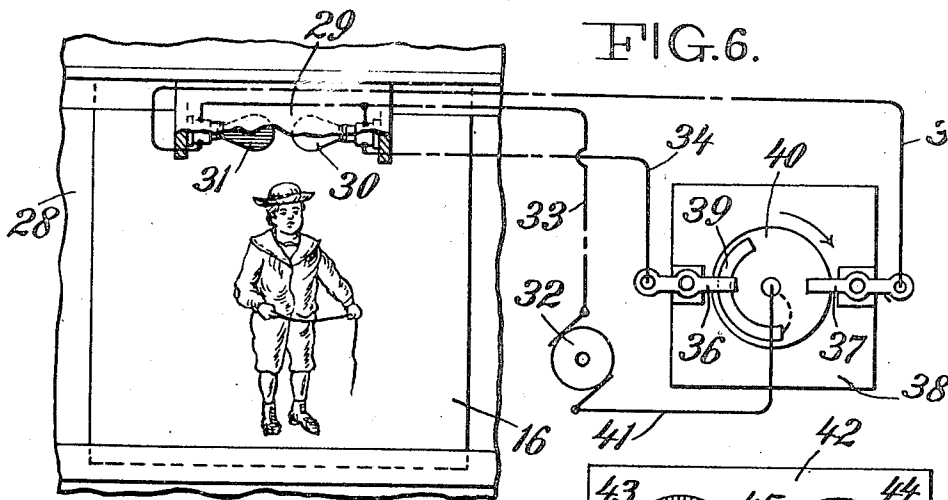
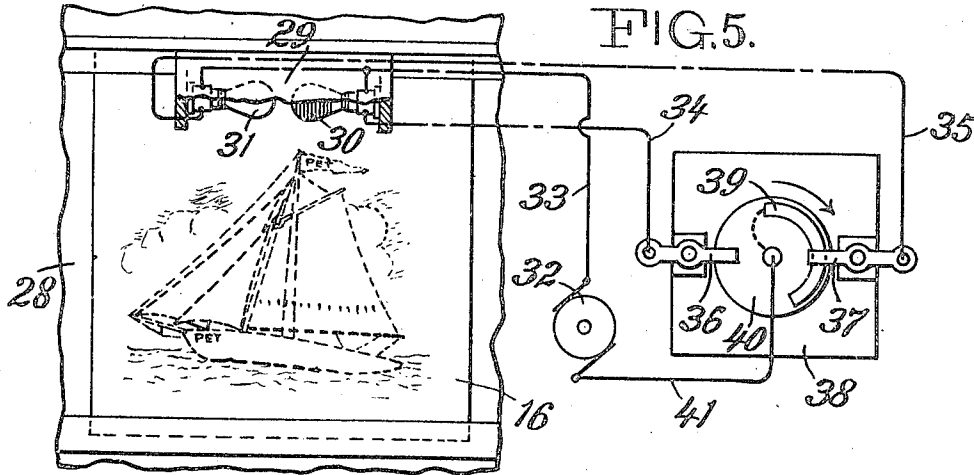
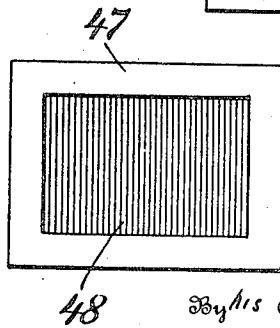
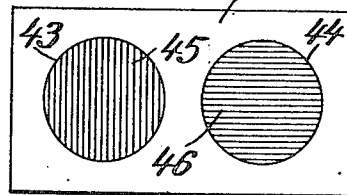


FIG. 8.



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UNITED STATES PATENT OFFICE.

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PLURAL-IMAGE DEVICE.

1,219,731.

Specification of Letters Patent.

Patented Mar. 20, 1917.

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To all whom it may concern:

Be it known that I, EDWARD HALL, a citizen of the United States, residing in Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Plural-Image Devices, of which the following is a specification.

My invention relates to a device which is particularly useful for advertising, educational or amusement purposes. The device consists essentially of superimposed images in different or contrasting colors associated with means for causing one of the images to become substantially invisible, whereby another will be made prominent.

In the accompanying drawings which form a part of this specification, Figure 1 is a perspective view of one type of my device; Fig. 2 is a vertical sectional view of the device of Fig. 1; Fig. 3 is a front elevation, parts being cut away to show the internal construction, of a modified form, of which Fig. 4 is a vertical sectional view; Fig. 5 is a partially diagrammatic view illustrating a further embodiment of my invention; Fig. 6 is a view similar to Fig. 5 showing the same structure but at a different cycle; Fig. 7 is a vertical sectional view of a portion of the construction of Figs. 5 and 6; Fig. 8 is an elevation of a pair of ray filters; and Fig. 9 is a similar view of a single ray filter.

Referring to the drawings in detail, the numeral 1 indicates a box, in the front of which is an opening 2. Mounted in any suitable way near the back of the box is a support 3 carrying the image plate 4. This plate bears a plurality of superimposed images, the separate images being depicted in contrasting colors. For purposes of illustration I have shown these images to be a boy 5 and a yacht 6. The picture of the boy may be in green and that of the yacht in red. These images may be formed on opposite faces of the plate 4, provided the plate is transparent, or they may be drawn or otherwise inscribed upon a single surface. At the top and bottom of the support 3 are the rollers 7 and 8 which carry an endless transparent band, one-half, 9, of which is colored green, and the other half, 10, is

colored red. In the drawings, vertical lining represents red and horizontal lining represents green. A motor 11 drives the roller 8 through the agency of a belt 12. A source of illumination, such as the incandescent lamp 13 may be placed in the front of the box, or daylight or external artificial light may be relied upon.

The operation of the device is as follows: A person viewing the apparatus from the front through the aperture 2 will see that part of the red image which is covered by the green portion of the band, and conversely, will see that portion of the green image which is covered by the red portion of the band. This is due to certain well-recognized optical principles. Normally, red rays of light will be reflected back to the eye of the observer by the red pigment or other coloring matter forming the red image. If this image is covered by a transparent screen, also colored red, and the shades are substantially the same, the eye will perceive only a uniform red field, since the red image will merge with the background. Similarly, the green image when covered by the green transparent screen merely presents to the eye a uniform green field. However, that portion of the red screen covering the image plate will prevent green rays which emanate from the green image from passing the screen and entering the eye of the observer. The result will be that the portion of the green field which is behind the red screen will appear substantially black to the observer, while that portion of the red field beneath the red screen will be substantially invisible, merging into the general tone of the background. In like manner, that portion of the green field which is beneath the green screen will be invisible, while that portion of the red field which is beneath the green screen will appear substantially black to the observer.

The result will be that as the dividing line between the differently colored portions of the screen passes across the field, the observer will see the picture change in character, as illustrated in Fig. 1 of the drawings. If the screen belt is moving in the direction

of the arrow in Fig. 2 and the lower portion is green and the upper red, the observer will see above the line of division the part of the image which is in green, while below the line of division he will see that portion of the image which is in red in the picture. There will thus be formed a dissolving view. When the line of division reaches the lower edge 14 of the partition 15, the field will be completely covered by the green portion of the screen belt, with the result that the entire red portion of the picture will be invisible, while the green picture will be visible. When the red portion of the screen belt covers the image, the green picture will be visible and the red picture will be invisible for the reasons already set forth. Thus, without the use of a projecting device, or moving parts involving the images, a dissolving or plural view is formed which may be adapted in many startling ways to educational, advertising or amusement purposes.

In Figs. 3 and 4 is illustrated a modification which is particularly adapted for signboard or similar purposes. In this case the image plate 4 of the device of Figs. 1 and 2 is replaced by a plate 16 which may be provided with the identical form of images already described. This plate is housed in a box 17 having an aperture 18 at the front through which the observer may view the image. In the lower portion of the box is an inclined partition 19 provided with an aperture 20, behind which is a source of light such as the incandescent lamp 21. In proximity to the aperture 20 is a disk 22 adapted to revolve upon the spindle 23. This disk is transparent and is divided along a diameter into two contrastingly colored fields 24 and 25. For purposes of illustration it may be considered that the field 24 is formed of green glass, while the field 25 is composed of red glass. A motor 26 causes the slow rotation of the disk by means of a belt 27.

The operation of the device, so far as the effect upon the observer is concerned, is very similar to that of the construction first described. It will be obvious that as the disk is caused to rotate in front of the light aperture 20, green light and red light alternately will be projected upon the image field. Since the green lines of the image appear green to the eye, because they reflect green rays and absorb red rays, they will appear substantially black when red light only is projected upon them. Simultaneously, the red portion of the image will become substantially invisible for the reason that it will merge into the red hue of the background, owing to the fact that the entire picture is flooded with red light. Similarly, the red lines of the image appear red to the eye because they reflect only red rays, and when green light is projected upon them they appear substantially black, while, co-

incidentally, the green lines merge into the background because the entire surface or field of the picture, except for the red lines, is made green by the green light projected upon it.

In Fig. 3 the green image (the boy) is represented in full lines and will be seen when the red section of the disk is covering the light aperture. The red portion of the picture (the yacht) is indicated in dotted lines and will only become visible when the green portion of the disk controls the light emanating from the lamp.

In the construction shown in Figs. 5, 6 and 7, different means are provided for causing the alternation in the character of the light projected upon the image. In this modification the same screen 16 is utilized, which is held in any suitable manner, as by the support 28, which may be a portion of a signboard. Situated beneath the hood 29 at the top of the device are two lights, a red light 30 and a green light 31. These lights are alternately connected to a source of electrical energy 32 through the common wire 33 and the distributing wires 34 and 35 which lead from brushes 36 and 37 forming a part of a flasher. These brushes are adapted to engage a segmental contactor 39 upon a constantly driven disk 40, the contactor being connected by the wire 41 to the opposite side of the source of energy. It will be seen that when the parts are in the position shown in Fig. 5 the current will be led from the source of energy through the flasher to the green lamp, while the red lamp will be dark. Similarly, when the parts have reached the position shown in Fig. 6, the green lamp will be dark and the red lamp will be lighted. By this arrangement the picture is flooded alternately with red and green light, with the same result as that attained and described in detail in connection with the structure illustrated in Figs. 3 and 4. When the green light is thrown upon the picture as illustrated in Fig. 5, the red image of the yacht will be visible, as shown, while when the red light is thrown upon the picture, the green image of the boy will become visible.

In Fig. 8 I have shown a rudimentary form of device consisting of an opaque medium or support 42 provided with a pair of circular apertures 43 and 44. In the aperture 43 is mounted a transparent element 45 which is colored red, while in the aperture 44 is mounted a transparent element 46 colored green. If now an image similar to those already described is viewed alternately through these two disks of colored material, the effect will be similar to that produced by the belt screen of the apparatus of Figs. 1 and 2.

A still simpler form of the device is illustrated in Fig. 9, in which an opaque support-

ing-frame 47 contains a transparent element 48 which is colored red. If a picture be formed with the superimposed images, as before, and the green image is of a very pale color, it will be practically unnoticeable because the eye is impressed with the insistent red image. If, however, the sheet 48 of transparent red material is laid over the picture or the picture is otherwise viewed through it, the pale green lines, being incapable of reflecting red rays, will turn substantially jet black, while the red image will merge into the general red tone resulting from the action of viewing the picture through the red screen. The result will be that the green image will stand out in striking vividness.

It will be obvious that if such a screen as that just described is supported as in the construction of Figs. 5, 6 and 7, a single red light will be sufficient to cause a change in the picture, although the green lines will always be faintly visible.

While I have described my invention throughout in connection with red and green colors for the contrasting images, it is obvious that other sets of contrasting or primary colors may be utilized, although I regard the red and green as most advantageous owing to the fact that they lend themselves readily to printing and other methods of producing images of the character described.

While I have illustrated and described only certain embodiments of my invention, I realize that it is susceptible of wide application and I do not desire to be limited to the precise structure shown and described.

Having thus described my invention, I claim:

1. In a device of the character described, a plural image formed by superimposed images of contrasting colors, and adapted to be viewed directly by the eye of the observer, a source of artificial light, means for limiting its effective illumination to said plural image, and automatic means for alternating the character of said illumination in correspondence with said colors.

2. In a device of the character described, a plural image formed of superimposed images of contrasting colors, a source of artificial light adapted to illuminate said image, means for screening the direct light rays from the eye of the observer, means for projecting rays from said source upon said image, and automatic means for alternating the character of said rays falling upon said image in correspondence with said colors, comprising a continuously rotating color screen.

3. In a device of the character described, a plural image formed of superimposed images of contrasting colors, adapted to be viewed directly by the eye of the observer, a source of artificial light, means for screen-

ing the eye of the observer from its direct rays, and means for automatically varying the character of said light falling upon said image in correspondence with said colors, and adapted to render each separate image successively visible.

4. In a device of the character described, a plural image formed of superimposed images of contrasting colors, separate sources of artificial light corresponding in number and color to the several images superposed, means for screening the direct light rays from the eye of the observer, and means for altering the character of light falling upon said plural image in correspondence with said colors.

5. In a device of the character described, a plural image formed of superimposed images of contrasting colors, separate sources of artificial light corresponding in number and color to the several images superposed, means for screening the direct light rays from the eye of the observer, and means for altering the character of light falling upon said plural image in correspondence with said colors, said means comprising a flasher.

6. In a device of the character described, a plural image formed of superimposed images of contrasting colors, a shadow box for displaying same, a source of artificial light, means for screening its direct rays from the eye, and automatic means for periodically alternating the character of said light falling upon said image in correspondence with said colors, adapted to render said separate images successively visible to the naked eye.

7. In a device of the character described, a plural image formed of superimposed images of contrasting colors, and adapted to be viewed directly by the eye of the observer, a source of artificial light, means for screening its direct rays from the eye, and automatic means for periodically alternating the character of said light falling upon said image in correspondence with said colors.

8. In a device of the character described, a variegated picture composed of individual monochromatic pictures having a common background, a frame therefor spaced from said picture, a source of artificial light mounted within said frame, and automatic means adapted periodically to vary the character of light reflected from said picture, and to render the said pictures successively visible to the naked eye.

9. In a device of the character described, a variegated picture composed of individual monochromatic pictures having a common background, a frame therefor spaced from said picture, a source of artificial light mounted within said frame and invisible to the eye of the observer, and automatic means adapted periodically to vary the character

of light reflected from said picture, and to render the said pictures independently visible to the naked eye.

10. In a device of the character described,
5 a variegated picture composed of individual monochromatic pictures having a common background and adapted to be viewed directly by the eye, a frame therefor spaced from said picture, a source of artificial light

mounted within said frame, and automatic 10 means adapted periodically to vary the character of light reflected from said picture, said means comprising a continuously rotatable color-screen.

EDWARD HALL.

Witnesses:

SEWARD DAVIS.

GERALD E. TERWILLIGER.