

July 31, 1934.

F. E. HARTMAN

1,968,037

DISPLAY MEANS AND METHOD

Original Filed Oct. 12, 1931

3 Sheets-Sheet 1

Fig. 1

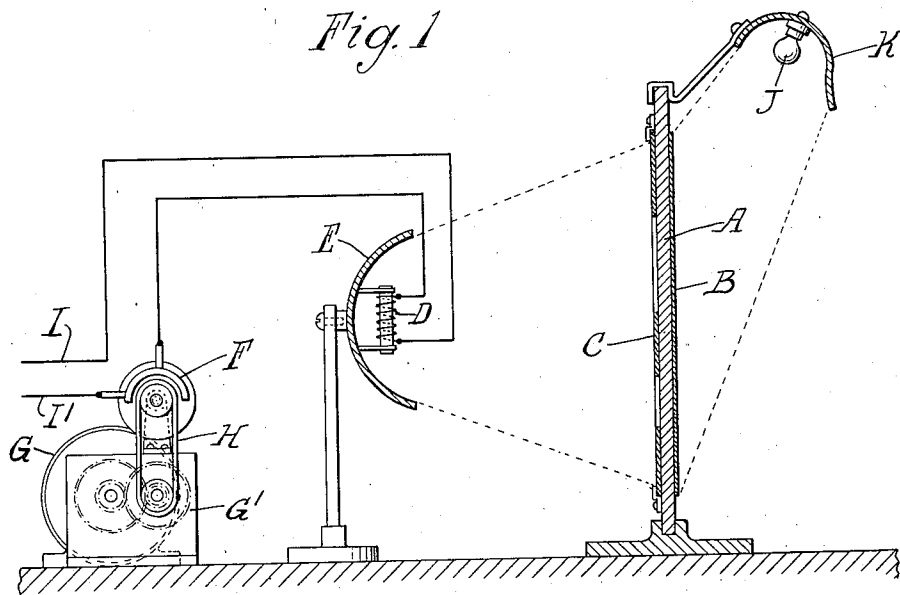


Fig. 2

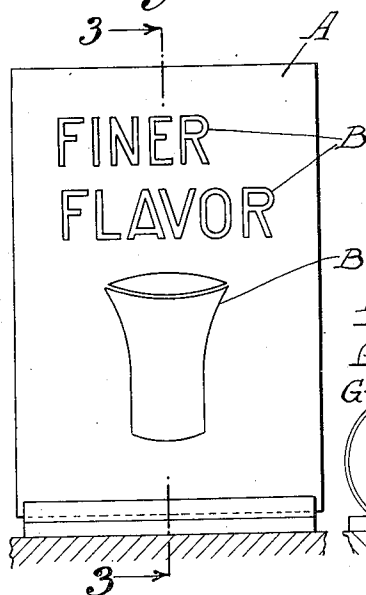
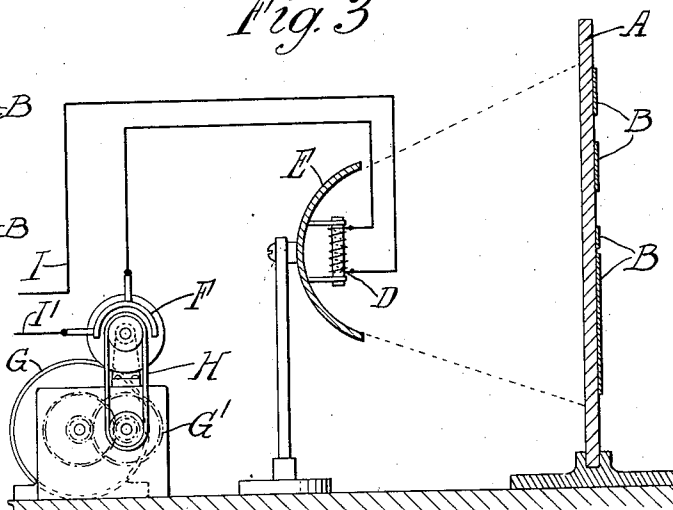


Fig. 3



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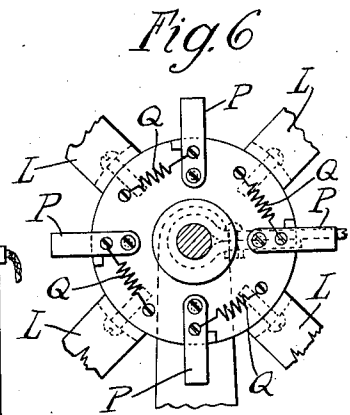
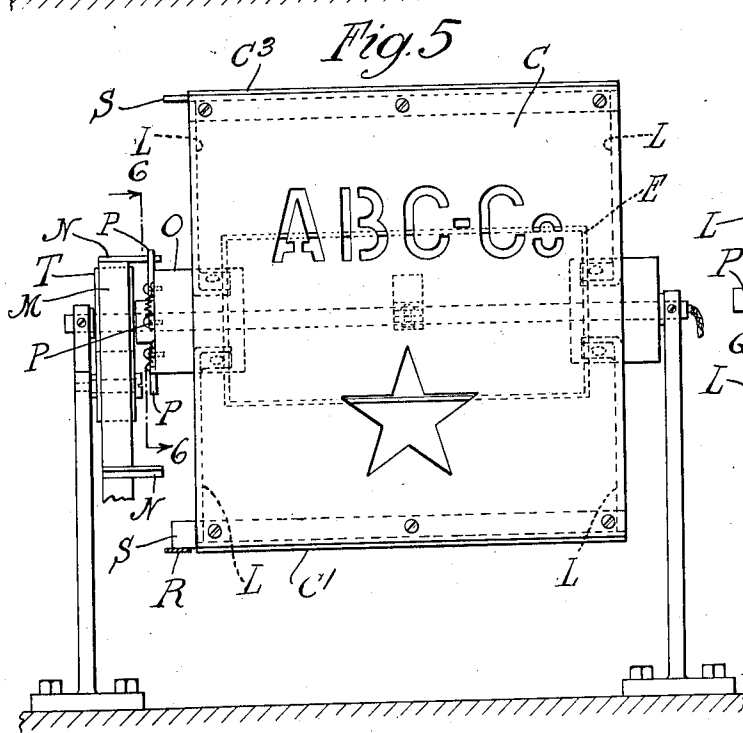
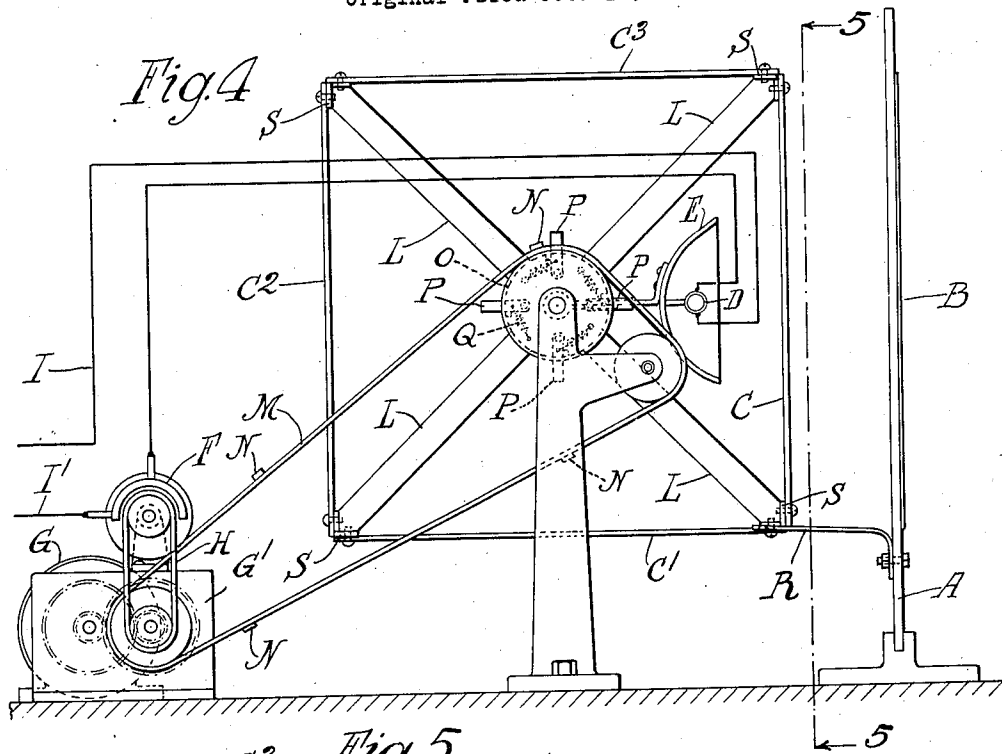
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DISPLAY MEANS AND METHOD

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DISPLAY MEANS AND METHOD

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3 Sheets-Sheet 3

Fig. 7

Fig. 8

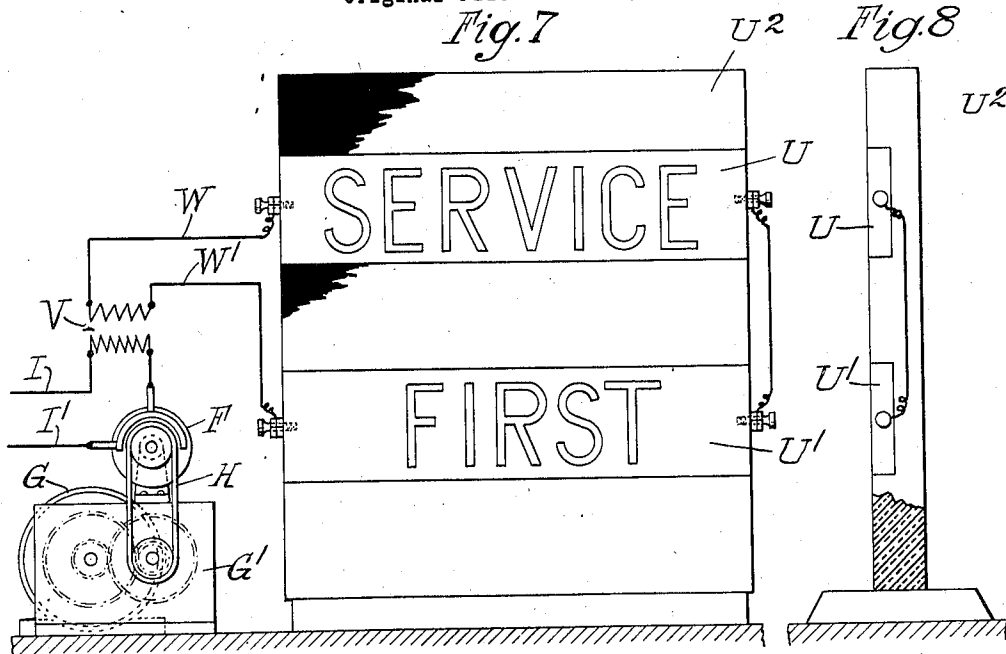
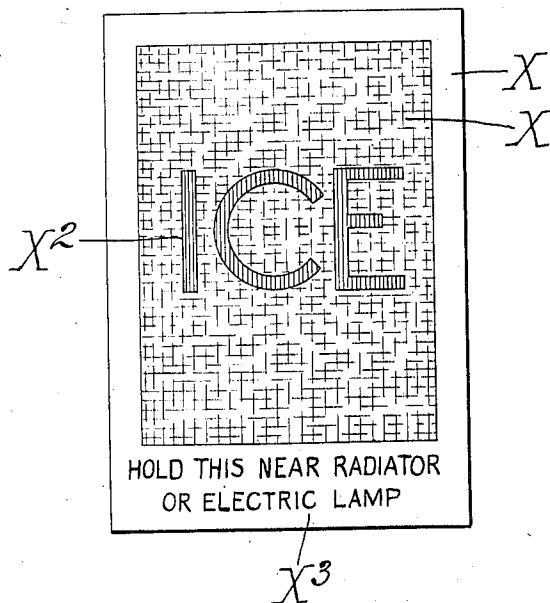


Fig. 9



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UNITED STATES PATENT OFFICE

1,968,037

DISPLAY MEANS AND METHOD

Frank E. Hartman, Chicago, Ill., assignor to Biological Engineering Laboratories, Chicago, Ill., a corporation of Illinois

Application October 12, 1931, Serial No. 568,305
Renewed June 9, 1933

8 Claims. (Cl. 40—130)

This invention has for one purpose to provide a novel and striking presentation of facts used in advertising, as well as to facilitate the demonstration of characteristic properties of a product, and to bring out hidden properties in a striking and novel manner. Another purpose is the presentation of a written message susceptible of quick, and if desired, constant change, as in an outdoor sign or window display, without the necessity of repainting or relettering such sign or display.

In the execution of my invention I contemplate the use of certain double iodides of mercury and metals in Group No. 1, of the Periodic Table of the Elements. It is a property of these double iodides to be highly colored, and to change color upon being heated above a specific temperature. For instance, at normal temperature, the color of the double iodide of the mercury and copper is scarlet, and upon heating this salt to a temperature of 87° C. or above, the color changes from scarlet to a deep purple or nearly black. Further, the double iodide of mercury and silver is a lemon yellow at normal temperature, but upon being heated to a temperature above 45° C., this salt assumes a red color. Upon cooling, these salts again assume their normal color and no fatigue is produced on countless changes of temperature. I also contemplate making use of the double iodide of mercury and the remaining metals, above copper, in Group No. 1 of the Periodic Table, and have also found that interesting color changes can be obtained with the double iodides of mercury and some of the metals in Group No. 8 of the Periodic Table, for instance, cobalt and nickel.

With these means at hand, a variety of color contrasts can be obtained upon the application of heat. I also contemplate enlarging this range of color contrast by the juxtaposition method of color combination, by incorporating certain staple colors in juxtaposed relation with the heat changing pigments in order to modify tones, or shades, both in the presence and in the absence of heat. As an instance of this, we may take the case of the double iodide of mercury and silver, which is yellow at normal temperature and changes to a red upon being properly heated. If the proper amount of blue, say Cyan blue, is mixed with this double iodide of mercury and silver, when viewed by reflected light, a greenish hue is observed. Now when heat is applied, the yellow of the double iodide will be changed to red, thus giving red and blue juxtaposed, which gives a purple shade with reflected light. It is

readily seen that through the practice of tinting, a variety of shades, which contrast well, can easily be obtained.

My method of employing these heat sensitive pigments either separately or in combination, or a combination of heat sensitive pigments with staple pigments, is detailed as follows: I propose to suspend the pigments in a vehicle, such as varnish, lacquers, or the like, and to paint these pigments upon panels of metal, glass, wood, or other suitable material, in any required design, and to subject the panels to local heating in order to bring about color changes, in restricted areas of the painted panels, thus bringing out designs through the contrast color obtained upon heating. I also change these designs, in a novel manner hereinafter outlined in detail.

Several embodiments of my invention are illustrated more or less diagrammatically by the following figures:

Figure 1 shows a sectional view embodying a stencil heat reflecting shield;

Figure 2 shows an alternative method for an intermittent or so-called flash sign;

Figure 3 shows a sectional view along the line 3—3 of Figure 2;

Figure 4 shows a sectional view of a flash sign carrying a continuously changing message;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is an enlarged section on the line 6—6 of Figure 5;

Figure 7 is a front elevation of a further variant form of flash sign;

Figure 8 is a side elevation, partly in section, of Figure 7; and

Figure 9 illustrates my invention as applied to a circular for advertising purposes.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to Figure 1, A is a panel painted over the surface indicated by B with a heat sensitive pigment. C is a stencil shield of bright or reflecting material which is cut out with a suitable design, for example as indicated in Figure 2, this shield C being situated immediately behind A and between A and a source of heat D. D may be any suitable source of radiant heat, preferably a resistance element which may be heated by application of an electric current. It is provided with a reflector E for reflecting the radiant heat against panel A. F is a rotary switch driven by any suitable mechanism such as the motor G with a gear reduction G¹ and the belt H. I and I¹ are electric service wires passing through the rotary

switch F to energize the heat element D. When the motor G is set into operation, the rotary switch F is caused to rotate, thus intermittently energizing the heating element D. When the heating element D is energized, heat is reflected on to the panel A, and portions of this heat are intercepted by the shield C and reflected back. The portions of the panel A not protected by the shield C, are painted a dull black so as to facilitate the absorption of heat by the panel A. In this way the portions of the panel A protected by the shield C do not become heated, whereas the portions of the panel A that are not protected by the shield C, readily absorb the heat due to their black body character and quickly come up to temperature sufficiently to affect the color of the heat sensitive pigment painted on the opposite side of the panel A. In this way portions of the panel A are caused to change color and thus bring out predetermined designs, letters, words, etc. As F is slowly rotated, the heating element D is de-energized, the panel quickly cools so that the entire surface B again assumes a solid color. By this time D is again energized and the predetermined design again brought out.

It is readily seen that by utilizing such an arrangement as illustrated by Figure 1 that the message or design obtainable on the outer surface of the panel A can be readily changed by simply changing the shield C.

Figure 2 illustrates another method of obtaining a flash or intermittent sign effect, without the use of the reflector C, by simply painting the surfaces, that are to change, with the heat sensitive pigment B and the remaining surface with a heat stable pigment. A similar source of heat D is employed with a reflector E and the rotating switch F, the intermittent effect being obtained precisely as outlined for Figure 1. Figure 3 shows a sectional view of Figure 2. Figure 4 illustrates a means of obtaining a number of different messages to be flashed from the same space in successive periods of time.

Referring to Figures 4, 5 and 6 the outer surface of the panel A is coated with heat sensitive pigment as indicated by B. A source of heat D is provided, together with a reflector E for reflecting the heat from D to the panel A. A rotary switch F is also provided for the intermittent operation of the heater D. A number of reflecting stencils, C, C¹, C² and C³, are mounted on a revolving frame L which is driven by the motor G, said motor G also serving to drive the rotary switch F. The belt M, serving as a driving means of the frame L, is provided with cams N, said cams being definitely spaced along M. The hub O of the frame L, is provided with spring catches P, so that when the cam N engages the catch P, the spring Q of the catch P is sufficiently stiff to start the frame work L into rotation, overcoming the resistance of the stop spring R, which is located on the panel A. Outstanding projections S, attached to the frame L, serve to engage the spring R. When the frame L has been rotated sufficiently, the spring R disengages from the engaging projection S, thus relieving the tension on the spring Q of the catch P and by this time the cam N of the belt M has passed beyond the catch P so that the catch P is brought to its normal radial position by the spring Q. The frame L continues to rotate until the second stencil is in line with the panel A, at which time the projection S of the second stencil engages the spring R which serves to arrest the motion of the frame L, since the belt M revolves on a free running pulley T about the hub O. The length

of time that any individual stencil remains in parallel position with A is determined by the space between the cams N and the speed at which the belt M travels.

Now, it is readily seen that when one stencil, say stencil C, is positioned between the source of heat D and the panel A, and the rotary switch F is in such position as to energize the heater D, heat will be transmitted to the panel A, except where intercepted by the reflecting stencil C. Thus, the panel A will be heated in portions positively, with respect to the negative design, or cut-outs, of C. It is thus seen that the heat sensitive pigments on the panel A will be affected in a manner that will bring out the design, occasioned by C, due to contrast in color occasioned by the local heating of the heat sensitive pigments. When the stencil C has remained parallel with A for the predetermined time, the rotary switch F cuts off the source of electric current to D thus de-energizing the heater. A cam on M then engages a catch P, causing the stencil C to move away from A and be replaced by stencil C³. During this period of time, the panel A has cooled sufficiently to obliterate the design occasioned by the heating through C, and the rotary switch F then assumes a position to re-energize D and thus bring out the design to be occasioned by the stencil C³. This cycle of events is repeated for as many stencils as the frame may be equipped with. It is readily seen that the stencils on the frame L can be readily changed, thus the various messages to be flashed from A can be changed without necessity of repainting the panel A by the mere changing of stencils.

Another means for carrying out my invention is illustrated by Figures 7 and 8. Figure 7 illustrates the front view of a panel, the strips U and U¹ being inlaid into the panel U² of insulating material as shown by Figure 8. These strips may be made from a high resistance metal alloy and are lettered with the heat sensitive pigment. For instance, the words "Service first" are painted on to the high resistance alloy with heat sensitive pigments and the remainder of the strip is painted a similar color with heat stable pigments. A low voltage circuit obtainable through the rotary switch F, transformer V, and wires W and W¹, is short circuited through the strips U and U¹. This causes sufficient current to flow through the strips to produce the necessary heat to affect the pigment and bring about the color change. This eliminates the necessity of a radiant heater and is very conservative of heat energy, since the heat is produced virtually in situ.

A further purpose of my invention is to permit the production of advertising novelties, particularly in the nature of printed matter. For instance, as illustrated in Figure 9, a piece of paper X may be printed with a yellow ink X¹ of the same tint as the normal color of the double iodide of mercury and silver. The double iodide of mercury and silver may then be incorporated in a suitable vehicle for printing, and any suitable design or message X² printed over this yellow paper. Since both inks are of the same color, this design or message will not normally be discernable. However, printed instructions X³ may be placed on the margin as illustrated by Figure 9 with the instructions to lay the sheet of paper on a radiator or hold it close to a suitable source of heat, such as an electric lamp. When this is done, the heat sensitive pigment will change from yellow to red, and the message will be immediately discernable as illustrated in Figure 9. This me-

dium of use may be somewhat enlarged and may be made to add considerable to pictorial value in advertising. As an instance of this, take the case of a fire insurance company wishing to impress the public the rapidity with which a fire can develop and destroy one's entire possessions. Let us assume that in various tones of yellow, a beautiful residence is depicted, and overlaid on this picture, in colors harmonizing with the picture, are heat sensitive pigments that change into brilliant red. These overlaid designs can be made in the form of flames leaping about the structure. Thus, when the paper containing this design is brought close to a source of heat, flames are suddenly shown to leap from all parts of the building. This is only one of the numerous means of utilizing my invention for illustrating contingencies, possibilities, etc.

I also have in mind changes in color that are effective to illustrate a point, for instance, a woman could be so treated with heat sensitive pigments, that the picture would appear wan and sickly, but upon the application of heat, rose tints and healthy flesh colors would become manifest.

These are given as only a few of the numerous applications of these particular pigments in the art of advertising.

In the matter of both outdoor and indoor signs, brilliancy is a desirable feature. In order to enhance the brilliancy of the pigments, I propose to illuminate the face of the sign with a flood light J and reflector K as shown in Figure 1. To further enhance the brilliancy, I also propose to employ fluorescent and phosphorescent substances such as zinc sulphide, etc., mixed with the pigment and to illuminate it with a source of light rich in ultra-violet, such as the so-called Cooper-Hewitt light, made with transmission glass or quartz, enveloping a mercury arc. I also find that when phosphorescent and fluorescent substances, such as zinc sulphide, etc. are admixed with the paints, a beautiful brilliancy is obtained when the surface of the sign is subjected to the action of radiation emanating from the radio active ore. The radio active ore may be incorporated in the vehicle, or may be separately brought close to the surface of the sign, subject to the radiation.

It will be realized that whereas I have described and shown a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawings to be taken as in a broad sense illustrative and diagrammatic rather than as limiting me to my specific showing.

I claim:

1. A display member including a body and a coating, applied to said body, of a material adapted to change color in response to a predetermined change of temperature and heating means, operatively associated with said display member, adapted to cause a temperature change sufficient to cause said change of color and means for limiting the effective application of heat from said heating means to an area of said coating conforming to a predetermined design, including a plurality of shields adapted selectively for interposition between the heating means and the display member body, said shields having formed therein one or more apertures adapted to form predetermined designs, and means for moving

said shields into and out of alignment between said heating means and the display member body.

2. A display member including a body and a coating, applied to said body, of a material adapted to change color in response to a predetermined change of temperature and heating means, operatively associated with said display member, adapted to cause a temperature change sufficient to cause said change of color and means for limiting the effective application of heat from said heating means to an area of said coating conforming to a predetermined design, including a plurality of shields adapted selectively for interposition between the heating means and the display member body, said shields having formed therein one or more apertures adapted to form predetermined designs, and means for moving said shields into and out of alignment between said heating means and the display member body, including a rotary carrier upon which said shields are mounted and means for rotating it.

3. A display member including a body and a coating, applied to said body, of a material adapted to change color in response to a predetermined change of temperature and heating means, operatively associated with said display member, adapted to cause a temperature change sufficient to cause said change of color and means for limiting the effective application of heat from said heating means to an area of said coating conforming to a predetermined design, including a plurality of shields adapted selectively for interposition between the heating means and the display member body, said shields having formed therein one or more apertures adapted to form predetermined designs, and means for moving said shields into and out of alignment between said heating means and the display member body, including a rotary carrier upon which said shields are mounted and means for rotating it intermittently and means for intermittently actuating the heating means.

4. A display member which includes a heat pervious body portion, a coating upon one side of said body portion of a material adapted to change color in response to a predetermined change in temperature, a source of heat spaced from the opposite side of said body portion and effective to heat the exposed surface of said body portion and means for shielding portions of said body portion from said heat, said shielding means being formed with apertures adapted to define a predetermined design.

5. A display member which includes a heat pervious body portion, a coating upon one side of said body portion of a material adapted to change color in response to a predetermined change in temperature, a source of heat spaced from the opposite side of said body portion and effective to heat the exposed surface of said body portion and means for shielding portions of said body portion from said heat, said shielding means being formed with apertures adapted to define a predetermined design, the exposed portions of said body portion being provided with a heat absorptive coating.

6. A display member which includes a heat pervious body portion, a coating upon one side of said body portion of a material adapted to change color in response to a predetermined change in temperature, a source of heat spaced from the opposite side of said body portion and effective to heat the exposed surface of said body portion, the face of said body portion exposed to the

heat being provided with a heat absorptive coating conforming to a predetermined design.

7. A display member which includes a heat pervious body portion, a coating upon one side of said body portion of a material adapted to change color in response to a predetermined change in temperature, a source of heat spaced from the opposite side of said body portion and effective to heat the exposed surface of said body portion, and means for limiting the access of said heat to portions of the color changing coating defining a predetermined design.

8. A display member which includes a heat pervious body portion, a coating upon one side of said body portion of a material adapted to change color in response to a predetermined change in temperature, a source of heat spaced from the opposite side of said body portion and effective to heat the exposed surface of said body portion, and means for limiting the access of said heat to portions of the color changing coating defining a predetermined design, and means for intermittently actuating said source of heat.

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15	90
20	95
25	100
30	105
35	110
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45	120
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55	130
60	135
65	140
70	145
75	150