Oct. 26, 1937. F. HOTCHNER 2,097,123

ANIMATED LUMINOUS DISPLAY

Filed Dec. 22, 1936 2 Sheets-Sheet 1

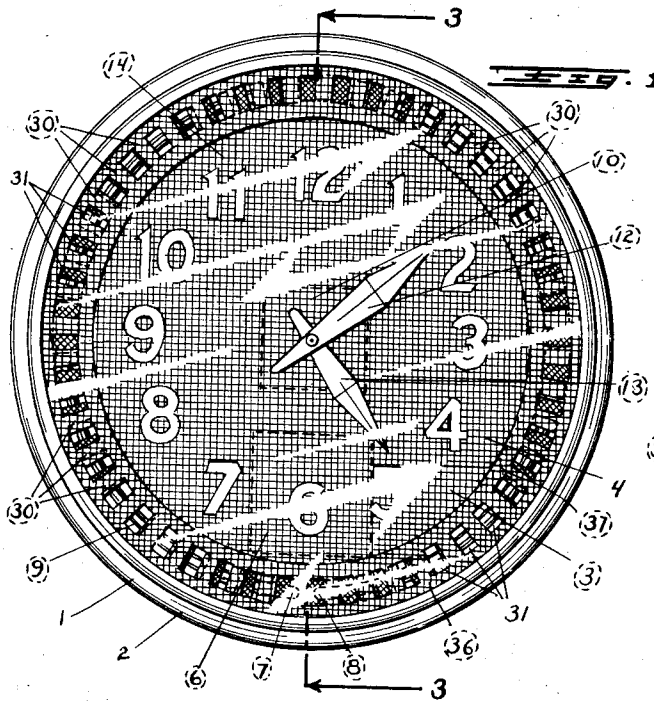


Fig. 1

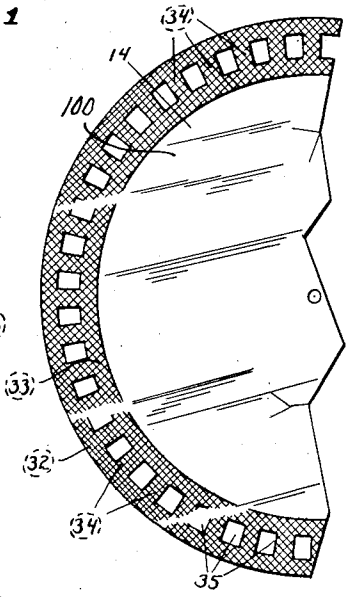


Fig. 2

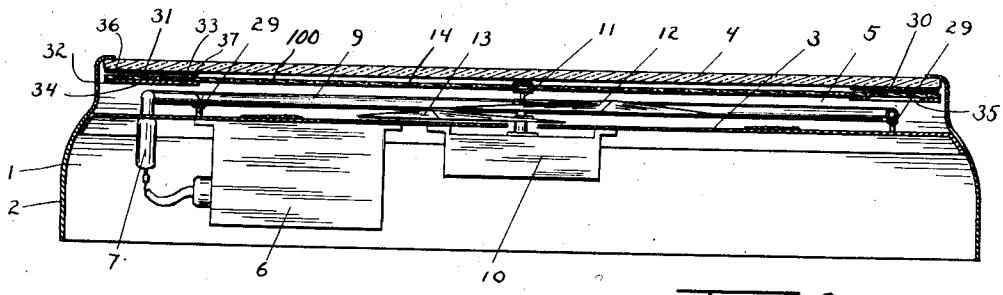


Fig. 3

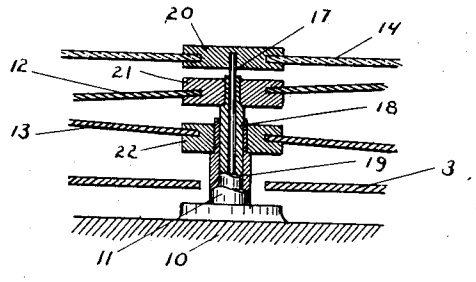


Fig. 4

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ANIMATED LUMINOUS DISPLAY

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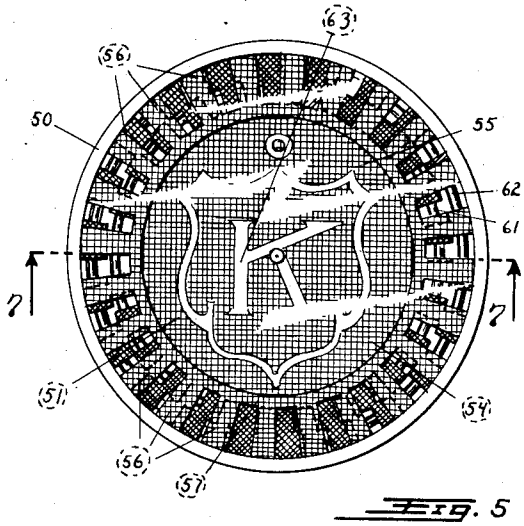


Fig. 5

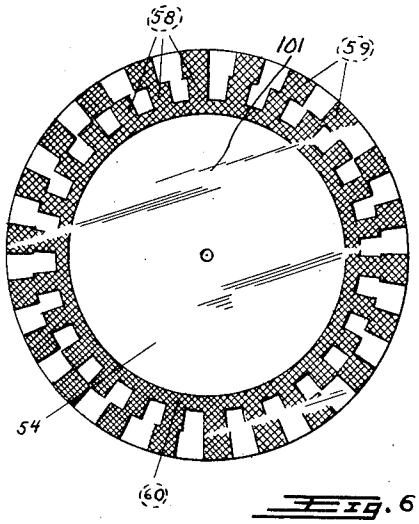


Fig. 6

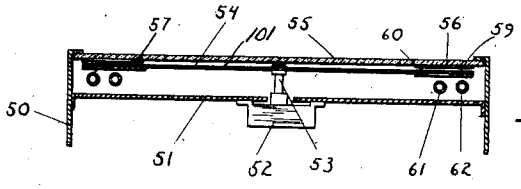


Fig. 7

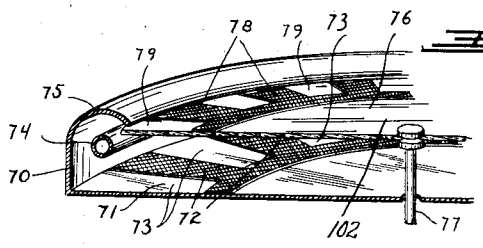


Fig. 8

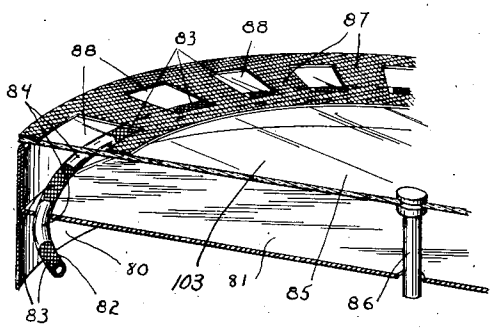


Fig. 9

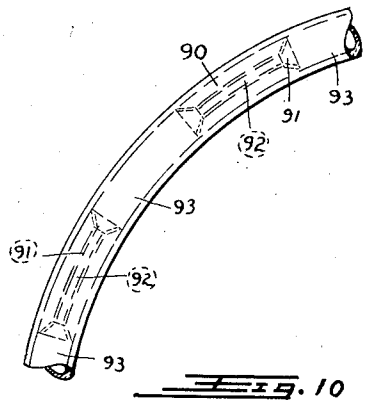


Fig. 10

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Patented Oct. 26, 1937

2,097,123

UNITED STATES PATENT OFFICE

2,097,123

ANIMATED LUMINOUS DISPLAY

Fred Hotchner, Los Angeles, Calif.

Application December 22, 1936, Serial No. 117,169

19 Claims. (Cl. 40—130)

This invention relates to a luminous motion display and is directed to the production of the illusion of rapid motion in a display by means of an element which moves at only a small fraction of the speed of the illusion. In general it contemplates the use of elongated light sources, of which the common luminous tubes may be taken as typical. It is related to the invention disclosed in my copending application, Serial No. 116,934, filed December 21, 1936, and makes use of the broad principles disclosed therein. I have chosen to illustrate it by two special embodiments thereof, but it is to be understood that the invention is not limited in its uses to such embodiments, nor to the particular type of light source shown, but may be variously adapted, modified and embodied within the purview of the claims.

One object of the invention is to produce a display in which the illusion of motion is produced through the interception of light rays by means of a light element which has no other mechanical duty than to carry its own weight and hence may be made simple and foolproof. Further in this connection I provide that the illusion need not depend on accurate manufacture or adjustment but may be made with only the usual care given to portable window display of the neon tube class and will remain in effective adjustment through all the usual handling that such devices meet in service.

Another object is to provide a device in which a single driving speed may be selected for the device, but which by the slight change involved in replacing one interceptor disk by another may be made to produce any of a variety of speeds in the resultant illusion.

Another object is to produce a display which will be effective at as wide an angle as any angle from which the device may normally be viewed and be distinct with devices made with only ordinary care.

A further object is to produce a novel effect which is very striking and gives rise to comment. This effect may be described as a "double travel" effect, or as it has appeared to some observers, a "twinkling" effect. This is due to the fact that the illusion itself is an effect of variations in spaced groups of areas which in their smaller elements evidence a different motion than that of the illusion.

Another object is to produce a traveling effect through the course of a luminous tube without moving the tube or flashing it electrically.

A further object is to provide in a luminous display, in which additional display matter is present beside the tube, for the illumination of such matter by steady light from the tube and the conservation for that purpose of a good portion of the light which is intercepted for the purpose of creating the traveling effect.

In connection with the embodiment of the invention which I have illustrated as an illuminated clock it is an object of the invention to produce a rapid turning effect with an interceptor element which need turn at no more than the speed of the usual second hand of the standard clock mechanisms. That is to say, the interceptor may be turned at one revolution per minute to produce an apparent speed of twenty-five to fifty or even more revolutions per minute if desired. This makes possible the use of standard clock works mechanisms which may be purchased at a low price and involves no change in the mechanisms themselves.

Another object is to provide the effect of travel in the opposite direction than that of the interceptor, and, as a further attraction feature, to produce the effect of a double border, each section of which travels in the direction opposite to the other in the illusion, by means of a mechanical element turning in one direction.

Further objects of the invention will become apparent from the following specification in connection with the drawings.

The invention is illustrated in its preferred embodiments in the accompanying drawings in which the same numeral appearing in more than one view refers to the same part throughout.

Figure 1 is a view of an illuminated clock provided with means to give the effect of a rapid traveling border around the dial.

Figure 2 is a face view of one half of the interceptor disk used in the clock.

Figure 3 is a sectional view of the same taken as indicated by the section line 3—3 in Figure 1. The transformer, hands and clockworks appear in full view.

Figure 4 is an enlarged cross section of the shaft and bushing assembly for carrying the hands and interceptor disk.

Figure 5 is a view of a display in which a double traveling border effect is produced with a single disk.

Figure 6 is a face view of the disk used in the clock shown in Figure 5.

Figure 7 is a cross-section of the device shown in Figure 5, taken as indicated by the section line 7—7 in Figure 5, with the mechanism shown in full view.

Figure 8 is a fragmentary perspective view of a modification of the device taken from an abnormal point of view. The light field in this case consists of a surface on which the light from the luminous tube is cast, with the tube itself being out of view. The segments are painted on this surface and the tube is so positioned as to most effectively illuminate the background including the copy.

In Figure 9 a further modification, similarly presented, is shown with the tube itself carrying obscurations corresponding to the segments of previous views.

Figure 10 is a view of a section of a special tube in which light and dark sections are produced by the construction of the tube itself in order that the minimum of energy may be consumed by obscuration of sections of the tube. The light in this case is produced mainly in those sections of the tube which corresponds to the lighted sections of the fields of previous views.

In the clock shown in Figures 1 to 4, numeral 1 indicates the clock, the body of which is formed by the casing 2. Within the casing are positioned the dial 3 and the cover glass 4, which together form the chamber 5 in which are the hands, the interceptor disk and the luminous tube.

In clocks of this general type the cover glass helps to spread the light over the dial by reflection from the inside surface. When the dial itself is finished with a gloss surface reflection takes place back and forth between the near surfaces of the dial and the cover glass and to a very considerable degree increases the illumination of the inner portions of the dial. Since the angle of reflection at the surface of the dial is very sharp, this effect is secured even with a dial of dark color or black, provided that the surface be glossy. In the instant invention the interceptor disk aids in this function. In fact for certain classes of work the cover glass may be eliminated and the interceptor disk charged with this duty entirely.

The luminous tube 9 is supported from the dial by the insulating posts 29 and has two electrode terminals 7 and 8 which extend through holes in the dial and are connected to the transformer 6 which is secured to the rear of the dial. The clock works 10, also secured to the rear of the dial, have the shaft and bushing assembly 11 extending through a hole in the dial into the chamber 5. This assembly includes the shaft 17, which carries the interceptor disk 14 of transparent material; and the concentric bushings 18 and 19, which carry the minute and hour hands, 12 and 13. While these driving elements may be geared to give any desired speed to the shaft 17, I have found that the usual one revolution per minute rate of the typical second hand is entirely satisfactory for this work. Thus, any of the various types of three hand clock movements available on the market may be used for this work.

The disk 14 and the hands 12 and 13 are carried by the hubs 20, 21 and 22, respectively, which make press fits with their corresponding driving elements.

One distinctive feature of this invention resides in the fact that the light passes directly from the source to the observer. The tube is positioned close to the light modifying means and may be made very intense if desired. A high percentage of the rays thus pass directly to the observer. The rays passing through any particular opening between the segments of the interceptor originate mainly in the portion of the tube immediately corresponding to the opening. I prefer to secure the effect by direct and total obstruction of the light by segments on the cover glass and the interceptor disk. It is permissible, however, to modify the light in other fashions. That is to say, instead of obstructing the light totally, it may be refracted, dispersed or modified in any other desired manner in order that portions of the source appear so different to the eye when the light therefrom is so modified as compared with portions of the source from which the light moves unaltered to the eye as to be clearly distinct.

In the clock illustrated there are a number of segments, 30, 30, etc. painted on the rear surface of the cover glass alternating with clear spaces 31, 31, etc. These segments are preferably opaque and finished black to the view and hence are shown cross shaded as are also the rings 36 and 37 also on the glass. The dial is also cross shaded to indicate that it has a black finish but the cross shading lines are offset in both directions from the lines indicating the finish on the glass to distinguish the two members from each other. The dial is viewed through the transparent center portion of the interceptor disk, indicated by 100, which portion is not specifically shown in Figure 1. On the rear surface of the interceptor disk there are similar segments indicated by 34, 34, etc. alternating with clear spaces 35, 35, etc. These segments and the corresponding rings 32 and 33 are preferably finished in black as indicated by the diagonal cross shading to distinguish it from the cross shading of the segments on the cover glass. Opaque rings, 36 and 37 on the glass, and 32 and 33 on the disk help to cut the effect out clearly to view from undesired reflection from within. It is not necessary to finish the background over the region behind the tube. In fact, if this part of the dial be painted white or left in the light reflecting condition, it intensifies the effect. Thus, in Figure 1, no cross shading appears on the portions of the dial seen through the openings between the segments. Surface reflections over the cover glass passing over the details above described identify the front surface of this member. The segments are preferably uniformly spaced on each element but differ in number on the two elements. Consequently there will be presented to view as many groups of light transmitting spaces as the difference in the number of segments on the two elements.

There being 48 segments on the glass and 44 on the disk, there will be four groups of light transmitting spaces which blend off into an equal number of groups of spaces which are so obstructed as to appear dark. At a distance these groups of spaces blend together to form a series of dark and light areas, each light area including a number of adjacent openings which permit the passage of a good proportion of the light. The dark areas cover a number of openings on the glass which are nearly or completely obstructed by segments on the disk.

When the disk in turning this illusion is had even to a very close view. In fact the illusion is clear when the observer is so close that he may see the actual movement of the disk segments. A peculiar and attractive effect is thus produced.

The speed of the illusory movement depends on the difference in the number of segments on the two elements and the length of the segments along the line of motion. That is to say, with regards to a point moving with the disk, there will be one revolution produced in the illusion with a displacement of one segment distance on the glass in the case of a border in which there

is one segment difference in number between the glass and the disk. When the difference in the number of segments is greater than one the speed will vary inversely with the number of the difference.

If the lesser number of segments be on the disk, the illusion will be in the opposite direction to the movement of the disk, and vice versa. In the clock illustrated, the illusion will be opposite to the movement of the disk. The open spaces through the glass between the segments being comparatively large it is possible to observe the actual movement of the segments of the disk by close inspection. However, at a material distance this will only be observed by deliberate inspection. The effect which strikes the attention first is that of a twinkling traveling illusion. The effect is distinct, striking and interesting however observed.

The amount of distortion of the illusion to the angular view depends on the separation between the disk and glass as compared with the dimensions of the segments. Actually, however, the permissible size of segments to produce satisfactory effects is so considerable that it is not necessary to construct the device with great accuracy. The class of construction common with illuminated clocks now on the market is entirely adequate for this purpose.

The most satisfactory effects are secured by providing a dark background on the dial with light colored characters and hands although there is much latitude permissible in this respect and the copy matter may be variously finished and positioned in this display to be lighted by direct rays from the tube. The copy may thus be on either surface of the cover glass, or the dial, and may be formed, constructed or impressed in any fashion or according to any method known in the art.

It is to be understood, of course, that the interceptor may be constructed in any suitable fashion. It may, as an instance, be formed of wire spokes carrying thin metal parts for interceptor segments as is shown in my copending application above mentioned.

In the device shown in Figures 5 to 7, I produce a double traveling effect through the course of two tubes through the use of a single disk. The tubes may be of different colors, in which case the copy matter will be lighted by blended light and the borders, viewed in the direct light of the tube, will appear of different color from each other and the copy. I show a dark background in this device with light colored copy.

The device consists of a casing **50** within which the other elements are secured. The background member **51** carries the mechanism **52** fastened to the rear and has the inscription 63 painted on the front. The journal **53** of the mechanism extends through a hole in the background and carries the interceptor disk **54** of transparent material. The tubes **61** and **62** are positioned behind the disk and form the double border. The cover glass **55** carries a series of segments **56**, **56**, etc. painted on the inner surface. These segments are of radial width sufficient to enclose both tubes to the view. An opaque ring **57** helps to define the effect. On the disk there are two rings of segments corresponding to the two tubes and cooperating with the segments of the glass to produce a double border effect. The inner segments are indicated by **58**, **58**, etc., and the outer segments by **59**, **59**, etc. And opaque ring **60** completes the pattern, all being on the rear surface of the disk. The center of the disk, indicated by **101**, is transparent to permit clear view of the inscription.

There are 24 segments on the glass and 26 and 22 in the inner and outer rings on the disk, respectively. Consequently there will be two groups of light spaces in each border and the inner will appear to turn with the disk while the outer turns against it. The speed will be approximately the same in both borders. The disk is transparent over the region covering the copy on the background.

In Figure 8 I have shown a device in which the tube is replaced by a surface which is illuminated by a tube positioned out of view. Segments are painted on the background and viewed through a disk as in the previous views. In this view the elements are shown disproportionally for the sake of clarity.

The housing, indicated by **70**, presents the display surface **71** on which are painted the segments **72** and such additional display matter in the center as may be desired. The segments alternate with the light areas **73**, **73**, etc., and are viewed through the clear spaces **79**, **79**, etc. between the segments **78**, **78**, etc., on the disk **76**. The center of the disk, indicated by **102**, remains transparent. The disk is carried by the shaft **77** driven by a clock works mechanism which is omitted in the drawings. The tube **74** is concealed under the rim **75** of the housing. As in the previously illustrated devices there is a difference in the number of segments on the background and the disk to produce a traveling effect.

In Figure 9 a further modification is shown in which the tube itself is provided with appropriate obscurations. The housing of the device is indicated by **80** and presents a display surface **81** on which the copy may be painted. This surface plays no essential part in the border effect and hence may be disregarded in this consideration. The tube **82** is obscured over spaced sections as indicated by **83**, **83**, etc., leaving the clear spaces **84**, which are viewed through the openings **88** between the segments **87** on the disk **85**. The angular length of the spaces on the tube is different from that of the segments and corresponding clear spaces and hence we have a traveling effect presented by the revolution of the disk. The disk is turned by the shaft **86** connected to a clock works mechanism omitted in the drawings. The center of the disc, indicated by **103**, remains transparent.

In Figure 10 I show a type of illuminating tube in which the light is produced mainly in the sections which are needed for the effect thus avoiding the loss incident to the use of obscurations. There are numerous other constructions possible under this broad idea and hence it will be understood as merely illustrative of the principle involved.

The tube is indicated by **90** and is provided with glass inserts **91** which constrict the discharge into the narrow passages **92**. The tube is so processed and charged with conducting gas that the light is produced mainly in the constricted passages and the illumination from the sections indicated by **93** is negligible. Such constructions are known in the art and need no amplification for the instant description.

The invention may be variously modified and embodied within the purview of the claims and hence is not to be limited by the particular embodiments of the same shown which are to be

regarded as illustrative of the invention and not as limiting the same.

The light interceptor may be variously constructed within the purview of the invention. One suitable construction alternative to that shown in the drawings consists of a metal interceptor having open spaces providing the light transmitting regions. An open space may also be provided through which the secondary copy matter may be viewed.

It is contemplated that the light source may be in other than circuitous forms, as for instance, straight lines. It is also contemplated that the interceptor may be moved in a direction other than the course of the light source and interception effected by virtue of a component of said movement in the general direction of the source.

As used in the claims the following terms are to be understood as having the significance which follows:

The term "light interceptor" shall be understood as including any structure or part serving the purpose defined. "Along said source" is to include any component so directed. "Light source" is to include any type of light in the general form described, any surface or object in the form described rendered luminous by a source not directly participating in the illusion due thereto, and any part of any source involved in the illusion as described. The term "transparent" shall apply as descriptive of objects of transparent material and objects having open spaces through which the indicia may be viewed. The terms "light field" and "luminous areas" are to include primary sources and surfaces or objects lighted by sources not directly participating in the illusion and in the form described. "Indicia" is to include any design, letter, symbol, figure or similar characterization or one or any number thereof. "Light intercepting" as descriptive of a property shall include any property which so modifies light rays that the portions of the source viewed thereby are visibly different and distinct from other portions of the source which are viewed at the same instant by rays not so modified, and includes refraction, dispersion, spectral selection, reduction, polarization and total obscuration. The terms "pivot" and "axis" shall embrace points or lines in space as described. The expressions "in front of" and "sideways" have reference to the ordinary positions of observers. The expression "substantially direct transmission of light rays from said source to the observer", or the like, means that the sections of the light source as observed by their own light appear in their own immediate vicinity. The expression "ordinary angles of view" means that range of angles of view over which displays of this nature are ordinarily expected to be clearly distinguished.

Having thus described my invention, what I claim is:

1. In a luminous display, a light source presenting a series of spaced light emitting areas and light intercepting means having spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of said areas whereby to successively and progressively intercept the light to produce the effect of spaced groups of said areas moving through said series at a different speed than said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

2. In a luminous display, a light source presenting a series of substantially uniformly spaced light emitting areas and light intercepting means having a series of substantially uniformly spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of said areas, said segments being spaced at a different frequency than said areas whereby to produce the effect of spaced groups of said areas moving through said series at a different speed than said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

3. In a luminous display, a light source presenting a series of substantially uniformly spaced light emitting areas and light intercepting means having a series of substantially uniformly spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of said areas, said segments being spaced at a greater frequency than said areas whereby to produce the effect of spaced groups of said areas moving through said series in the same direction but at a greater speed than said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

4. In a luminous display, a light source presenting a series of substantially uniformly spaced light emitting areas and light intercepting means having a series of substantially uniformly spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of said areas, said segments being spaced at a lesser frequency than said areas whereby to produce the effect of spaced groups of said areas moving through said series in the opposite direction to the movement of said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

5. In a luminous display, a light source having a plurality of spaced light emitting areas and light intercepting means having light intercepting segments presenting with said source a double series of luminous areas, the frequency of said segments being greater than that of the corresponding areas of said source in one of said series and less than that of the corresponding areas in the other of said series whereby to produce the effect of motion in opposite directions upon the movement of said intercepting means in either direction lengthwise with the series, means to move said interceptor to traverse said segments across said areas, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than the rays passing through said intercepting means and to be viewed from the front of said display.

6. In a luminous display, an elongated illuminant, means to obscure to view the light therefrom in such manner as to present a series of spaced luminous sections, and light intercepting means having spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of and generally

lengthwise with said illuminant, said segments being so disposed as to produce an attraction effect in conjunction with said luminous sections by the order of interception of the rays therefrom, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

7. In a luminous display, an elongated illuminant, means to define to view a series of spaced luminous sections thereof, and light intercepting means having spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of and generally lengthwise with said illuminant, said segments being spaced at a different frequency than said luminous sections whereby to produce the effect of motion therealong at a different speed than the speed of said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

8. In a luminous display, an elongated illuminant, means to define to view a series of spaced luminous sections thereof, and light intercepting means having spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of and generally lengthwise with said illuminant, said segments being spaced at a lesser frequency than said luminous sections whereby to produce the effect of spaced groups of said sections moving in the opposite direction to the movement of said intercepting means, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

9. In a luminous display, an elongated illuminant, means to define to view a series of spaced luminous sections thereof, and light intercepting means having spaced light intercepting segments, and means to move said intercepting means to traverse said segments in front of and generally lengthwise with said illuminant, said segments being spaced at a greater frequency than said luminous sections whereby to produce the effect of spaced groups of sections moving in the same direction as said intercepting means and at a greater speed, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

10. In a luminous display, an elongated light source, a pair of light interceptors each of which has a plurality of light intercepting segments spaced along the course of said light source and in front thereof and means to move said interceptors relative to each other along the course of said light source whereby to variously intercept the rays therefrom to the observer, and additional display matter in the vicinity of said light source disposed to be lighted by rays passing generally sideways therefrom and to be viewed from the front of said display.

11. In a luminous display, an elongated light source, a pair of light interceptors each of which has a plurality of light intercepting segments periodically spaced along the course of said light source and in front thereof, said segments being spaced at a different frequency on each of said interceptors and means to move said interceptors relative to each other along the course of said light source whereby to variously intercept the rays therefrom to the observer in illusion of motion at a different speed than the speed of said interceptors relative to each other, and additional display matter in the vicinity of said light source disposed to be lighted by rays therefrom other than rays passing through said intercepting means and to be viewed from the front of said display.

12. In a luminous display, an elongated light source, a pair of light interceptors each of which has a plurality of light intercepting segments spaced along the course of said light source and in front thereof to present to view two serial groups of changing luminous areas upon the movements of said interceptors relative to each other, the frequency of the light transmitting spaces between the segments being greater on one of said interceptors than on the other for one of said groups of luminous areas and less for the other of said groups of areas, and means to move one of said interceptors relative to the other whereby to produce the illusion of motion in opposite direction through said groups of luminous areas.

13. In a luminous display, a tubular light in the form of a border, indicia positioned to be lighted by rays passing generally sideways therefrom, and a pair of light interceptors disposed to move relative to each other along said border and around a pivot therewithin, said interceptors having light intercepting segments spaced along the course of said light and in front thereof, said segments being of different frequency on each of said interceptors, and means to move one of said interceptors relative to the other around said pivot.

14. In a luminous display, an elongated light source, means in association therewith to define to view a plurality of spaced luminous sections of said source, light intercepting means having spaced light intercepting segments, and means to move the same to traverse said segments in front of said source to variously intercept the light from said luminous sections to produce an attraction effect, and indicia associated with said source so as to be lighted by rays therefrom other than the rays participating in said attraction effect and to be viewed from the front of said display.

15. In a luminous display, an elongated light source, means in association therewith to define to view a plurality of spaced luminous sections of said source, said source being in the form at least in part of a circuitous border, indicia positioned within said border to the view and positioned to be lighted by rays from said source passing generally sideways therefrom, light intercepting means pivoted on an axis within said border and having light intercepting segments in front of said source and spaced therealong to produce an attraction effect through the various interception of light from said luminous sections, said interceptor being transparent to the view over the region of said indicia, and means to turn said interceptor around said axis.

16. In a luminous display, a light source having a plurality of spaced light emitting sections, a light interceptor having a plurality of spaced light intercepting segments, and means to move said elements relative to each other to traverse said segments across said sections of said source, said sections and segments being positioned to operate in such close relation that the effect thus produced is substantially the same from all ordi-

nary angles of view and as observed by a person passing said display under normal conditions of observation, and additional display matter in the vicinity of said source disposed to be lighted by rays therefrom other than the rays passing through said interceptor and to be viewed from the front of said display.

17. A luminous display including an extended light source, a pair of light interceptors each of which has a plurality of spaced light intercepting segments, and means to move said interceptors relative to each other to traverse the segments of one across the segments of the other in front of said light source, said interceptors being positioned to operate in such close relation to each other that the effect thus produced is substantially the same from all ordinary angles of view and as observed by a person passing said display under normal conditions of observation, the spacing of said segments along the line of relative motion being different on each of said interceptors.

18. A luminous display including an extended light source, a pair of light interceptors each of which has a plurality of spaced light intercepting segments, and means to move said interceptors relative to each other to traverse the segments of one across the segments of the other in front of said light source, said interceptors being positioned to operate in such close relation to each other that the effect thus produced is substantially the same from all ordinary angles of view and as observed by a person passing said display under normal conditions of observation, said segments being substantially uniformly spaced along the line of relative motion on each of said interceptors but at a different spacing than the segments of the other interceptor.

19. A luminous display including an extended light source, a pair of light interceptors each of which has a plurality of spaced light intercepting segments, and means to move said light interceptors relative to each other to traverse the segments of one across the segments of the other in front of said light source, said interceptors being positioned to operate in such close relation to each other that the effect thus produced is substantially the same from all ordinary angles of view and as observed by a person passing said display under normal conditions of observation, and additional display matter in the vicinity of said source disposed to be lighted by rays therefrom other than the rays passing through said interceptors and to be viewed from the front of said display.

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