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R. E. BARCLAY

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FIG. 1.

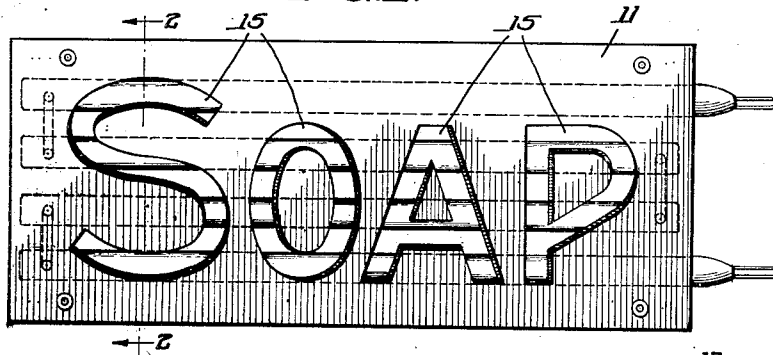


FIG. 2.

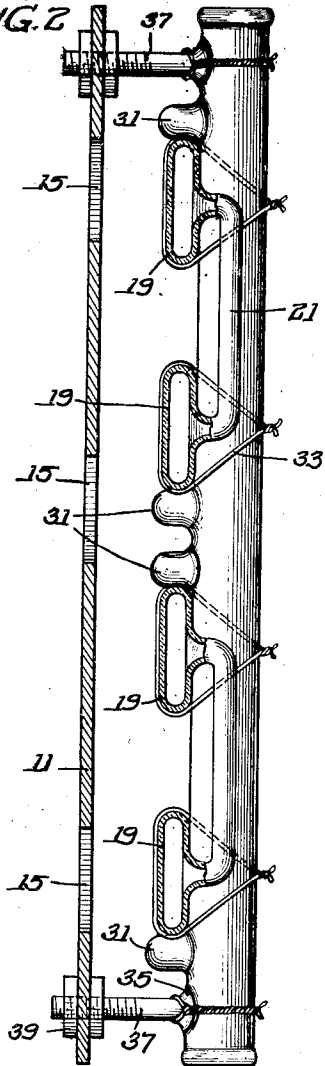
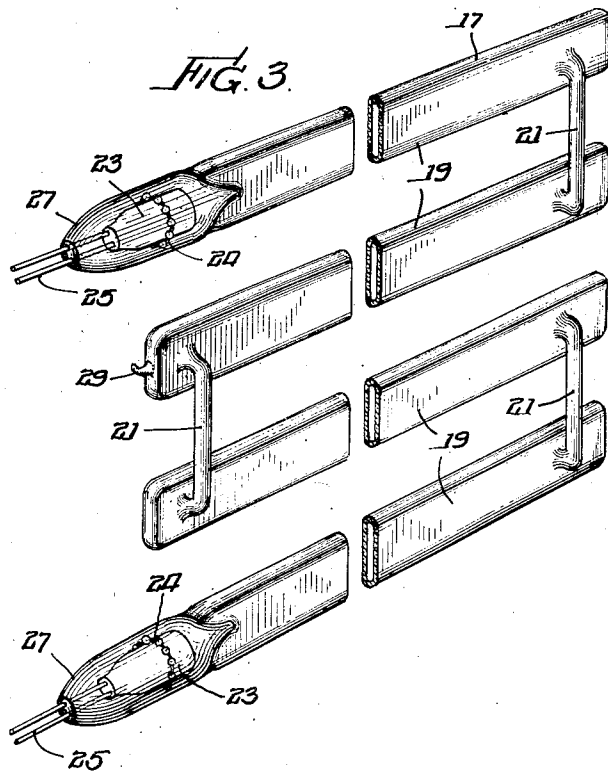


FIG. 3.



Inventor:
Robert E. Barclay,
By: Cheever, Cox & Moore
attys.

UNITED STATES PATENT OFFICE

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Robert E. Barclay, Chicago, Ill., assignor to Federal Electric Company, Chicago, Ill., a corporation of New York

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12 Claims. (Cl. 40—130)

My invention relates in general to display devices and has more particular reference to an illuminating sign of novel construction and adapted to produce extremely sightly and eye-arresting effects.

An important object of the invention is to provide a sign comprising a cut-out or silhouette characters, and means to create a wavering light effect behind the sign and visible therethrough, so that the characters may be silhouetted against shifting beams of light.

Another important object is to provide a discharge element, preferably arranged in the form of a grid, in which the illumination produced by the discharge is of a wavering, ever-changing character, well adapted for producing attention-getting effects in devices of the class described.

Another important object resides in producing flickering discharge effects simply by forming the discharge envelope in an unusual yet simple and inexpensive manner.

Among the other important objects of the invention is to provide a discharge illuminating device embodying an envelope having relatively wide flat channel portions and intermediate connecting portions of relatively restricted character for the purpose of imparting a wavering or flickering characteristic in the discharge created in the alternately wide and restricted channel; to utilize mercury vapor in a device of the character described in order to produce the wavering effect; to form the relatively wide portions in parallel spaced apart relationship in order to form a grid suitable for use in illuminating signs, more particularly silhouette signs; and, in general, to improve the attention-getting character of signs.

Numerous other objects and advantages will be apparent from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment of the invention.

Referring to the drawing:

Figure 1 is a front view of a sign embodying my present invention;

Figure 2 is a vertical section taken substantially along the line 2—2 in Figure 1; and

Figure 3 is a perspective view of a novel discharge illuminating device embodying my present invention.

To illustrate my invention, I have shown on the drawing a sign of the so-called silhouette type comprising a panel 11 having cut-out portions 15 in the form of characters forming subject matter of display. The panel may be of any suitable sheet material such as a steel plate, the char-

acters 15 being punched out of the plate, or the sign might be of transparent material having an opaque coating, which is cut away at the proper places in order to form the silhouette characters. My invention, however, is not limited to the manner of forming the sign strip or plate 11, which contains the characters to be illuminated for display purposes.

In order to illuminate the characters, I mount a discharge illuminating device comprising a lamp 17. This lamp has certain novel features and may be used for other purposes than to illuminate a sign. However, in the present instance, I am employing the lamp to provide a wavering light behind the panel for the purpose of illuminating the characters 15 by silhouetting or vignetting.

The lamp 17 comprises means, preferably glass, forming a transparent sealed chamber having elongated portions 19 of relatively large cross-sectional area and connected together in series by means of connector portions 21 of relatively restricted cross-sectional area.

The portions 19 also are preferably arranged in parallel spaced apart relationship as illustrated clearly in Figure 3 of the drawing while connector portions 21 interconnect the ends of the adjacent portions 19 in order to form a grid having a substantial overall area. The portions 19 also are preferably flattened and are substantially oval in cross-sectional configuration, that is to say, the channels provided by the portions 19 are widened in a plane extending normal to the line of vision of an observer.

The lamp 17 is also provided with electrodes 23 of ordinary construction, which are preferably arranged in the sealed envelope forming the grid at the opposed ends of the discharge channel. The electrodes are spaced from the walls of the channel by the usual necklace 24 of preferably glass beads.

The electrodes may be inserted in a manner well known in the glass blowing art. The electrodes also have conductors 25 extending out of the sealed ends 27 of the initial and terminal portions of the envelope for the purpose of connecting the electrodes in an external circuit (not shown) for supplying power to the discharge channel defined by the envelope in order to establish discharges therein.

The envelope, after the electrodes are inserted, may be evacuated, bombarded to remove impurities and filled with a suitable gas, such as neon, crypton, argon, or the like, which is known to form a gaseous conductor for the discharges,

in a manner well known in the art of making discharge illuminating devices, the envelope, after having been so treated, being sealed up as at 29 in a known manner.

5 When high frequency alternating voltage currents are applied between the electrodes 23 as by connecting the conductors 25 to an external source of suitable electrical power, the gaseous contents of the envelope in the channel extending between the spaced electrodes will be excited to produce discharge illumination therein. Initially the discharge will appear to fill the entire channel in the wide portions 19 as well as in the restricted portions 21. However, after a short interval, the discharge in the wide portions will become attenuated and will waver and flicker in the enlarged portions. The effect produced in the entire lamp unit will be extremely attractive and eye-arresting especially when the envelope is arranged as a grid and the discharge begins to flicker in all the sections 19 since the flickering discharge does not waver in exactly the same manner in any given spot throughout the extent of the channel but in each portion the character of the flicker is different and constantly changes.

It is my understanding that the flickering effects are caused because the channel is alternately widened and restricted throughout its length for which reason the pressure of the gaseous atmosphere within the channel is in a constant state of change at any given point in the channel, the changes in pressure being caused by the discharge through the alternately wide and narrow portions of the channel. Of course, the pressure within the channel equalizes itself as soon as the discharge creating power is disconnected so that when the lamp is initially activated the discharges, since they are traveling through a channel having substantially the same pressure at all points therein, will not flicker, however, after the discharges have been passing in the channel for a short while, the pressure differences will be set up and the flickering characteristic will become apparent.

45 In order to mount the lamp 17 behind the silhouette strip 11, I provide a preferably glass tube 29 on which the grid shaped lamp 17 may be firmly mounted. Of course, any suitable material, preferably an inert insulated material may be employed but I prefer to use glass in the form of a tube. The glass tube is also formed with projections 31 properly spaced apart to receive a pair of the portions 19 snugly therebetween.

50 The portions 19 are held in spaced apart relationship by means of the connector member 21 and are held with their outwardly facing edges in snug engagement with the projections as clearly shown in Figure 2 of the drawing.

55 The grid may be secured to its support member by means of the cords or wires 33, which encircle the support and the portions 19. The grid may be mounted behind the panel in any suitable manner as by tying the support 29 on the formed end 35 of a standard spacing member 37, the opposite end of which is secured to the panel as indicated at 39.

60 In the illustrated embodiment, the upper and lower end of the support is held in spaced relationship behind the panel in this manner and the lamp 17, being held in front of the support members 29 at opposite ends of the panel 11, is thus mounted immediately behind the panel in position to be viewed through the cut-out characters 15 so that from the front of the sign, the characters will have the striped or

streaked appearance shown in Figure 1, the streaks comprising the wavering light produced in the portions 19 and the black space intermediate said portions.

One of the important advantages attained in my present invention is the production of a wavering unit in a sign of the character described in an inexpensive manner simply by forming the glass envelope in the manner described, that is to say, with alternate enlarged and reduced channel sections whereby the wavering effects are produced without introducing expensive circuit changing apparatus in the external circuit from which the lamp unit is energized.

Another important feature is the manner of utilizing the wavering effects by producing them simultaneously in parallel and adjacent portions of the same unit. The cost of producing the lamp is very little if any more expensive than the cost of making an ordinary discharge lamp in the usual manner and yet, without increasing the expense, I have produced a very attractive and unusual effect.

It is thought that the invention and numerous of its attendant advantages will be understood from the foregoing description and it is obvious that numerous changes may be made in the form, construction, and arrangement of the several parts without departing from the spirit or scope of my invention or sacrificing any of its attendant advantages, the form herein described being a preferred embodiment for the purpose of illustrating my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. An electrical discharge device comprising a plurality of tubular glass portions arranged in adjacent parallel relationship and connected together at their opposite ends to form a tubular grid providing a serpentine channel, a suitable gaseous conductor medium in said channel, and means to discharge electrical power there-through, said tubular portions being of relatively larger cross-sectional area than the end connectors.

2. The combination of an electrical discharge device as set forth in claim 1 and means forming a silhouette sign having transparent portions in front of the discharge device so that the illumination produced by the device may be visible through the transparent portions of the silhouette sign.

3. The combination of means forming a silhouette sign having transparent portions and an electrical discharge illuminating device arranged behind the silhouette sign in position to be viewed through its transparent portions, said discharge device comprising tubular portions extending in spaced parallel relationship and connected to one another in series by means of connector portions, said main portions having a cross-sectional configuration elongated in a plane parallel with the plane of the silhouette sign and having a cross-sectional area greater than that of the connector portions and means to discharge electrical power through the main and conductor portions of the device in order to create flickering light effects in the main portions behind the silhouette sign.

4. In combination, a discharge unit comprising an envelope defining spaced channel portions and a channel portion connecting said spaced portions and a mounting comprising a member having abutments adapted to engage

the opposite outwardly facing edges of an adjacent pair of said spaced apart portions to hold the same snugly therebetween.

5 5. In combination, a discharge unit comprising an envelope defining spaced channel portions extending in a common plane, and a portion connecting said spaced portions and extending out of said common plane and a mounting comprising a member having abutments adapted to engage the opposite outwardly facing edges of an adjacent pair of said spaced apart portions to hold the same snugly therebetween and means to secure the discharge device on the mounting with its spaced parallel portions in engagement with said abutments, said spaced portions being maintained in spaced apart abutment engaging position by said connector portion.

20 6. In combination, an electric discharge illuminating unit comprising an envelope defining spaced channel portions and a channel portion containing the spaced portions and a mounting for the unit comprising a glass-like member having integral spaced abutments adapted to engage the opposite outwardly facing portions of an adjacent pair of interconnected channel portions to hold the same snugly therebetween.

25 7. In combination, an electric discharge illuminating unit comprising an envelope having spaced channel portions and integral means to maintain said channel portions in spaced relationship and a mounting comprising a member having integral spaced abutments in position to engage the opposite outwardly facing edges of the spaced portions to hold the unit snugly therebetween.

30 8. In a combination, an electric discharge illuminating unit comprising an envelope formed to provide spaced apart channel portions extending in a common plane and a connector portion connecting the spaced portions and maintaining the same in spaced relationship, said connector portion extending out of said common plane and a mounting comprising a member adapted to engage the sides of said spaced portions adjacent the connector portion, said member having abutments adapted to engage the opposite outwardly facing edges of said spaced portions and means to secure the unit on the support with the connector portion of the unit in position engaging the member whereby to prevent relative longitudinal movement of the spaced portions with respect to the member.

50 9. An electrical discharge device comprising an envelope containing a medium adapted to glow

when electrically excited, said envelope comprising an elongated channel having relatively restricted bore portions at intervals in its length, said channel having portions providing a relatively large bore intermediate the restricted portions whereby to impart a wavering or flickering character to the glowing medium when the same is excited and said relatively large bore portions being arranged in parallel relationship, and a silhouette sign member mounted in front of the relatively large bore portions.

10. An electrical discharge illumination device comprising an envelope containing a medium adapted to produce illumination when electrically excited, said envelope comprising a channel of restricted bore at intervals in its length to form enlarged bore portions separated by a restricted bore portion, said enlarged bore portions being arranged in parallel spaced relationship substantially in a common plane to form a grid, and means forming a silhouette sign having translucent portions arranged in front of the plane of the grid so that the illumination produced in said enlarged portions of the envelope may be visible through the translucent portions of the silhouette sign whereby to produce a banded appearance in the sign.

11. An electrical discharge device comprising a plurality of tubular glass portions, the cross-sectional configuration of which is of relatively narrow elongated form, said portions being arranged in adjacent parallel relationship and connected together at their opposite ends to form a tubular grid providing a serpentine channel, a gas within said channel capable of being electrically excited to glow, and means to electrically excite said gas.

12. A sign comprising an envelope containing a medium capable of being electrically excited to produce illumination, said envelope comprising a channel, the bore of which is alternately of relatively large and relatively small cross-sectional area whereby to produce flickering or wavering effects therein when the medium is excited therein, the portions of said envelope of enlarged cross-sectional area being arranged in parallel spaced relationship substantially in a common plane to form a grid-like structure, and means forming a silhouette sign member having translucent portions operatively arranged in front of the grid-like structure so that the sign member may form a silhouette against the illumination produced by said enlarged portions of the envelope when the medium therein is excited.

ROBERT E. BARCLAY.