

Sept. 5, 1933.

O. L. SANDERS

1,925,155

ADVERTISING SIGN

Filed Oct. 27, 1930

3 Sheets-Sheet 1

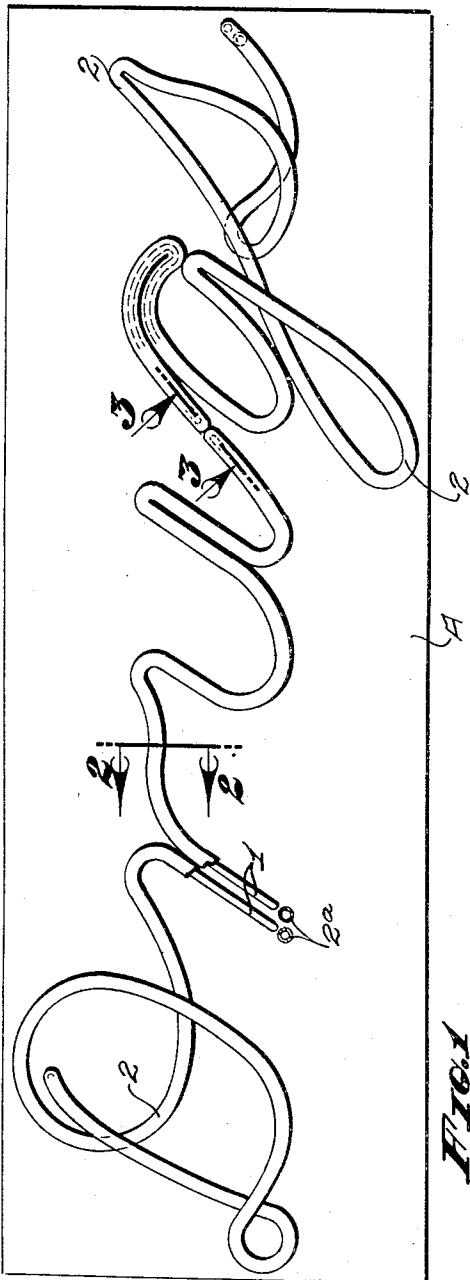


FIG. 1

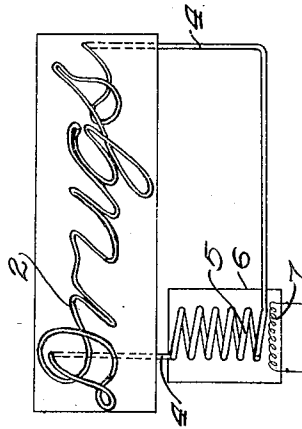


FIG. 2

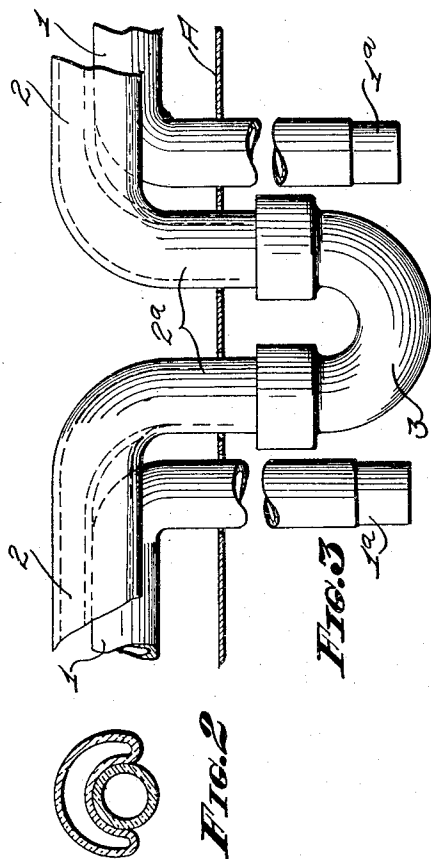


FIG. 3

INVENTOR
OSCAR L. SANDERS
BY A. B. Bouman
ATTORNEY

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3 Sheets—Sheet 2

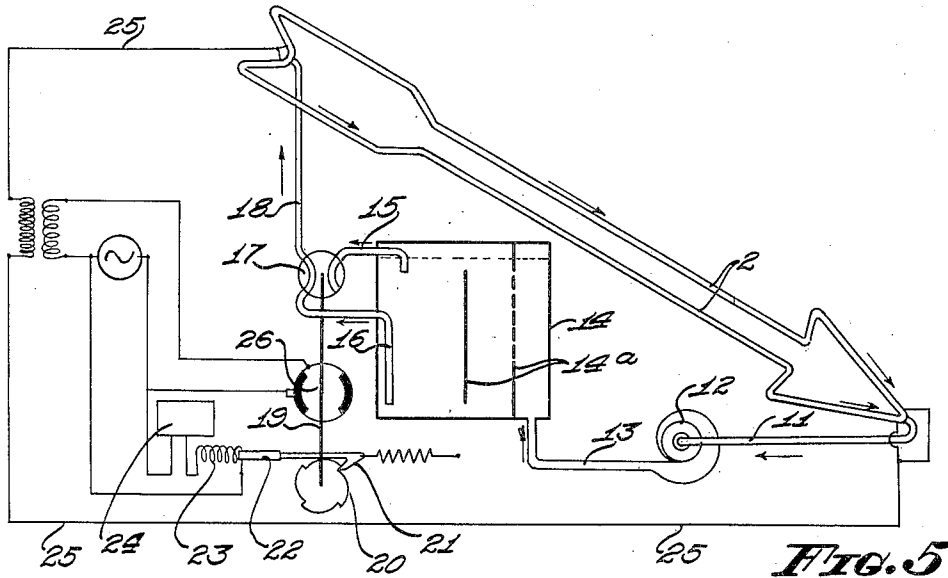


FIG. 5

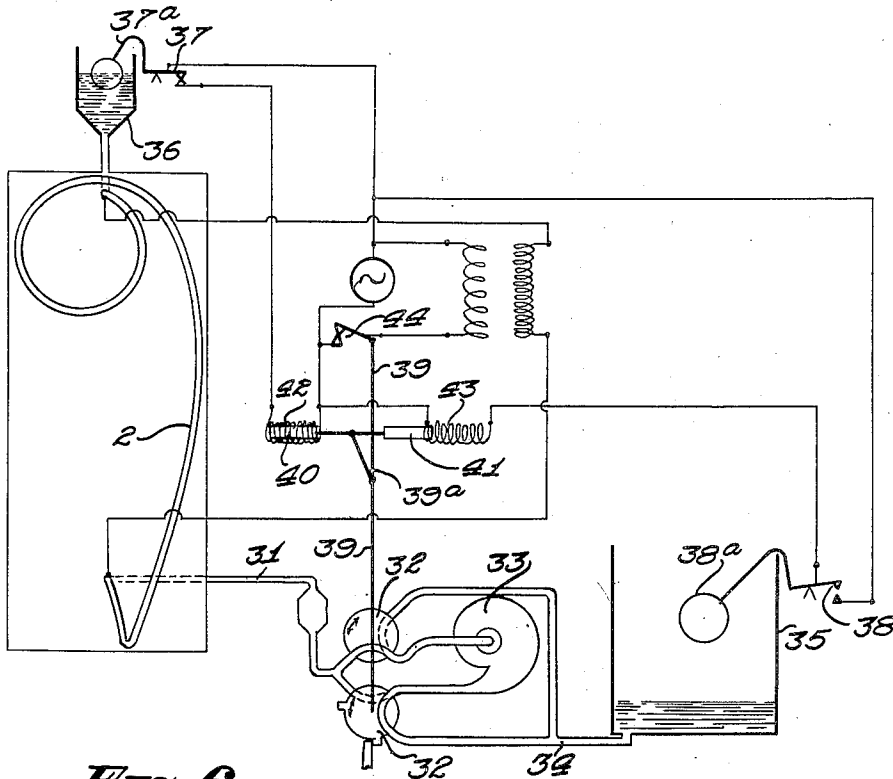


FIG. 6

INVENTOR
OSCAR L. SANDERS
BY
A. B. Bowman
ATTORNEY

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O. L. SANDERS

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3 Sheets-Sheet 3

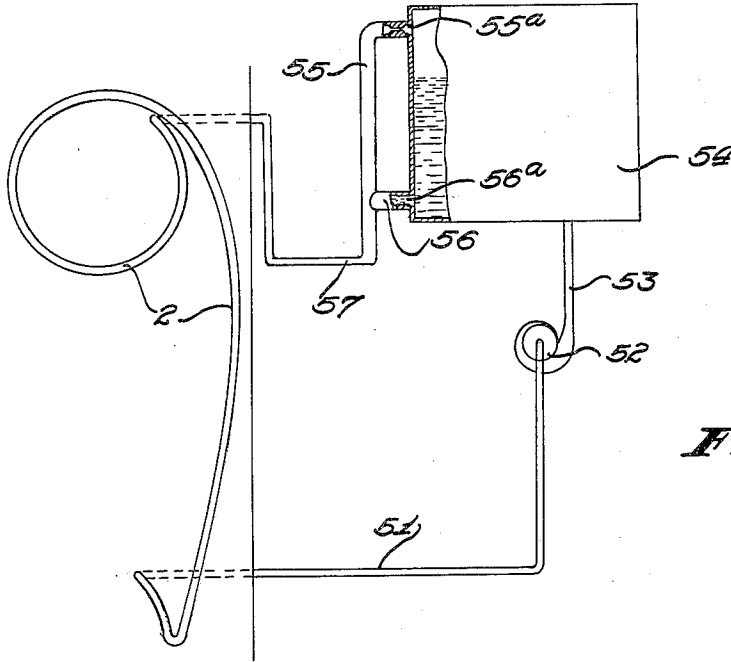


FIG. 7

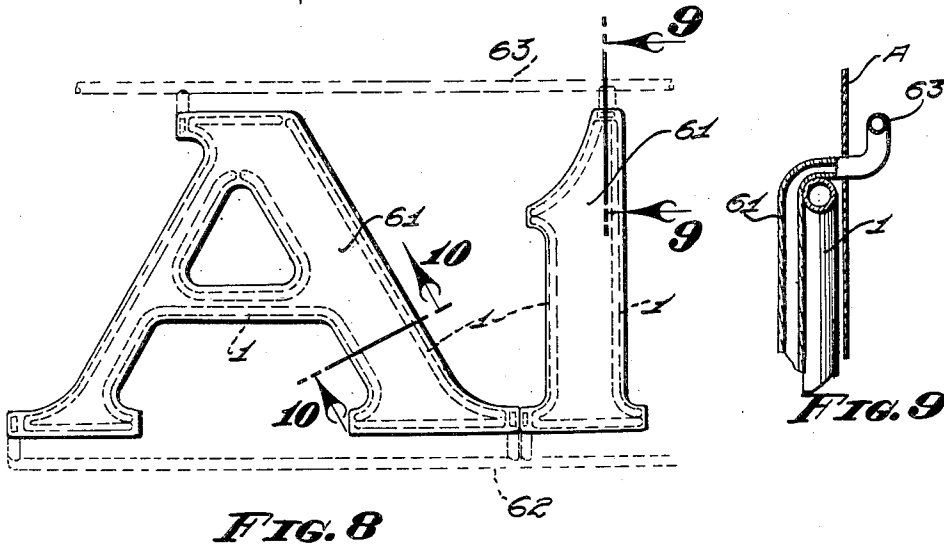


FIG. 8

FIG. 9

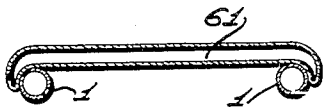


FIG. 10

INVENTOR
OSCAR L. SANDERS
BY
A. B. Bowman
ATTORNEY

UNITED STATES PATENT OFFICE

1,925,155

ADVERTISING SIGNS

Oscar Lee Sanders, San Diego, Calif.

Application October 27, 1930. Serial No. 491,394

7 Claims. (Cl. 40—130)

My invention relates to signs, and the objects of my invention are:

First, to provide a sign which is particularly adapted to be animated;

5 Second, to provide a sign which is particularly effective when used in conjunction with illuminable gas tubes, such as neon tubes;

10 Third, to provide a sign in which the illumination may appear to begin at one end thereof and travel progressively to the other end thereof in such a manner that the illuminated portions of the sign become visible in uniformly progressive order;

15 Fourth, to provide a sign of this class which eliminates the need of rapid blinking of adjacent units of a sign in order to produce an animated effect, thus prolonging the life of the illuminable gas tubes;

20 Fifth, to provide a sign which may be heated during cold weather so as to prevent the collection of sleet or icy particles and the consequent danger of injury to the sign;

25 Sixth, to provide a sign in which many different forms of animation may be provided, thus providing a sign which lends itself to the limitations and advantages of each place of installation;

30 Seventh, to provide a sign which eliminates the unsightliness of the conventional neon tube sign during daytime by forming an independent sign in front of the neon tubes;

Eighth, to provide a novel sign element for a sign of this class; and

35 Ninth, to provide on the whole a novelly constructed sign which is simple of construction proportional to its functions, durable, efficient in its action, and which will not readily deteriorate or get out of order.

40 With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

55 Figure 1 is an elevational view of my sign with parts and portions broken away to facilitate the illustration; Fig. 2 is an enlarged transverse sectional view of the sign elements taken through 2—2 of Fig. 1; Fig. 3 is an enlarged sectional view taken through 3—3 of Fig. 1, with parts and portions shown in elevation; Fig. 4 is an illustration of one method of operating my sign which

is also adapted to maintain the sign in a warmed condition during cold weather so as to prevent the collection of ice or sleet; Fig. 5 is a diagrammatical view of a mechanical means for operating my sign; Fig. 6 is a diagrammatical view of a modified mechanical means of operating my sign; Fig. 7 is a further modified mechanical means of operating my sign; Fig. 8 is a modified form of my sign structure; Fig. 9 is a fragmentary sectional view thereof through 9—9 of Fig. 8, and Fig. 10 is a transverse sectional view through 10—10 of Fig. 9.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

60 Gas tubes 1, fluid conductors 2, couplings 3, pipes 4, coil 5, container 6, heating means 7, pipes 11, pump 12, pipe 13, separating tank 14, outlet pipes 15 and 16, valve 17, pipe 18, shaft 19, ratchet 20, pawl or catch 21, armature 22, solenoid 23, sequence switch 24, electricity conductors 25, flashing switch 26, pipe 31, double valve 32, pump 33, pipe 34, container 35, reservoir 36, float switches 37 and 38, valve shaft 39, armatures 40 and 41, solenoids 42 and 43, switch 44, pipe 51, pump 52, pipe 53, separating tank 54, gas pipe 55, liquid pipe 56, common pipe 57, character forming container members 61, common intake main 62, and common outlet main 63 constitute the principal parts and portions of my novel sign.

65 The sign structure illustrated in Figs. 1 to 7, inclusive, comprises lengths of gas tubes 1 arranged substantially in the manner of the conventional neon sign. These gas tubes or neon sign elements have the usual terminals 1a.

70 Formed over or around the neon sign tube is a fluid conductor 2. The fluid conductor 2 may be of U-shaped cross section, in which case it extends approximately half way around the neon tube.

75 The fluid conductor is transparent and preferably formed of glass. It may be formed from an annular tube of glass or by pressing the glass, when heated to a plastic condition, over the neon tube, thus fusing the tube with the conductor and forming a unitary structure. However, when the particular configuration of the neon tube can be duplicated exactly, the conductor may be formed independently of the tube so that replacement of the tube does not require replacement of the fluid conductor.

80 In the ordinary sign, it is impossible to have one continuous neon tube; hence the neon tubes are usually divided into sections, each having its terminals. Where the neon tube is in the form

of strips or any continuous line, the terminals of adjacent sections of the tubing are as close together as possible, so as to minimize the break in the light.

5 The fluid conductors may also be divided into unitary sections, as shown in Fig. 1. The ends of each section of the conductor are formed into short, right angularly disposed tubes 2a, which extend into the face A of the sign support. Inside of the sign the contiguous ends of adjacent fluid conductor sections may be connected by a short tubing 3, such as rubber tubing, this being easily positioned over the ends of the fluid conductor and readily forming a fluid-tight joint therewith.

10 The purpose of the fluid conductor is to enable a liquid or gas to be passed in front of the neon tube. In the diagrammatical view, Fig. 4, the ends of the fluid conductor are joined to pipes 4, which are connected to the ends of a coil 5. The coil 5 is positioned in a suitable container 6, in which is also a heating means 7, such as an electrical heating coil, steam pipe coil, or gas heater. The heating means causes a circulation of liquid or gas through the fluid conductor 2, thus warming the neon tubes and preventing the collection of sleet or other ice formation and the consequent damage to the neon tube.

25 The circulation of fluid thus provided may be also used to cause animation of the signs. This may be accomplished by using two immiscible liquids, such as water and oil, and dissolving in one of the liquids a substance insoluble in the other liquid, and which is capable of rendering the liquid in which it is dissolved relatively opaque. When the opaque liquid fills the sign, it is rendered invisible at night, but as the opaque liquid passes from the sign and is followed by the other transparent liquid, the sign becomes progressively illuminated.

30 Beginning at one end, the illuminated portion increases uniformly until the transparent liquid completely fills the sign. The opaque liquid then begins to fill the sign again, progressively blotting out the illumination from the neon tube until the transparent liquid has been replaced by the opaque liquid, whereupon the cycle begins over again. If not desired to completely blot out the sign, the liquids may be divided so that the sign has alternately illuminated and blotted out portions, traveling from one end to the other end thereof.

40 It will be noted that this use of the liquid is particularly adapted to have neon signs arranged in the form of scripts, as the advancing illumination of the sign gives an appearance of writing by an invisible hand.

55 If desired, a mechanical means may be provided for effecting a circulation of fluid through the fluid conductors, such an arrangement as is shown diagrammatically in Fig. 5.

60 In this case, the liquid passes from the sign through a pipe 11, into the intake side of a pump means 12, from the outlet of the pump, through a second pipe 13, to a separating tank 14. Baffle means 14a are provided in the tank, which are arranged in such a manner as to allow separation of the two liquids used in the system, two immiscible liquids being used as in the first arrangement.

70 Two outlet pipes 15 and 16 are provided for the separating tank. The upper pipe 15 is adapted to extend into the lighter of the two liquids, which assumes a position on top of the heavier of the two liquids. The lower pipe 16 extends into the

bottom of the tank so as always to draw off the heavier liquid.

The pipes 15 and 16 extend into a valve 17, which communicates with a pipe 18, leading to the intake side of the fluid conduit 2. The valve 17 is adapted to alternately connect the pipes 15 and 16 with the pipe 18.

80 The valve 17 is mounted on a shaft 19, upon which is also mounted a ratchet wheel 20. The ratchet wheel 20 is engaged by a pawl 21, which is connected to an armature 22, which is acted upon by a solenoid 23. The solenoid is in series with a suitable sequence switch 24, which periodically completes the circuit so as to cause periodic operation of the solenoid. The neon tube 1 may be connected through conductor 25 and the transformer to a flashing switch 26 mounted on the shaft 19.

90 Operation of this circulating mechanism is as follows:

95 Circulation through the conductor 2 is continuous. The level in the separating tank 14 is approximately constant but the relative amounts of the two liquids therein vary. The valve 17 permits the passage of one liquid during a period long enough to fill the fluid conductor 2, then shuts off the flow of this liquid and causes the flow of the other liquid. Thus, if one liquid is opaque, the neon sign is blotted out periodically, and as the opaque liquid is drained off, it gives forth illumination progressively from one end, thus causing an apparent movement of the light from one end to the other of the sign.

100 During the times when the sign is blotted out, or when filling with the opaque liquid, the neon sign may be turned off. This is the purpose of the flashing switch 26.

105 By speeding up the action of the solenoids 23, the opaque and transparent portions of the sign may follow in rapid succession.

110 It is obvious, of course, that instead of using opaque liquid, contrasting colored liquids may be used, which when illuminated by the particular color of the various types of gas tubes, give off the desired light.

115 In the structure shown in Fig. 6, a single liquid only need be used. In this structure, the lower or discharge end of the conductor 2 is connected through a pipe 31 to a double valve 32. The double valve 32 is connected through a pump 33 and through a pipe 34 to a container 35. The double valve 32 is arranged to oscillate so that when in one extreme position, the pipe 31 is connected to the intake side of the pump and the outlet side of the pump is connected through the pipe 34 to the container. When the valve is in its other extreme position, it is connected to the outlet side of the pump, while the inlet side of the pump is connected with the container. Thus, with the pump continuously rotating in one direction, liquid may be pumped into or drawn from the conductor 2. The upper or other end of the fluid conductor 2 is connected to a reservoir 36, which may be relatively small as compared to the container 35.

120 Associated with the reservoir 36, is a switch 37, operated by a float 37a extending into the reservoir 36. Likewise, the container 35 is provided with a switch 38, having a float 38a arranged to extend into the container. The double valve 32 is mounted on a shaft 39, having an arm 39a connected therewith, which, in turn, is joined to the armatures 40, and 41 of solenoid coils 42 and 43, respectively. The solenoid coil 42 is connected in

series with the switch 37 and the solenoid 43 is connected in series with the switch 38.

The circuit through the neon or gas tube is controlled by a switch 44 actuated by the shaft 39.

5 Operation of this structure is as follows:

The container 35, pipe line 34, pump 33, and a portion of the pipe line 31 are filled with liquid, preferably an opaque liquid. When thus filled, the switch 38 associated with the container is in its closed position, whereas the switch 37 associated with the reservoir is in its open position, and the pump 32 is so connected as to draw the liquid from the container and force it outwardly through conductor 2. The flow continues in this direction until the fluid conductor is completely filled, and the level of the liquid has risen into the reservoir 36, to the point where the switch 37 is closed. This is the condition illustrated in Fig. 6. As soon as the liquid level in the container 35 has dropped below the float 38a, the switch 38 is open so that upon closing of the switch 37, the solenoid 42 is actuated whereupon the double valve 32 shifts from the dotted line to the solid position shown in Fig. 6 so as to connect the intake side of the pump 33 with the fluid conductor 2. The pump then draws the liquid out of the conductor 2, and the conductor 2 becomes filled with air drawn in through the reservoir 37. As the air is transparent the receding level of the opaque level of the opaque liquid gives the appearance that the neon tube is progressively becoming illuminated from one end to the other.

In the operating mechanism shown in Fig. 7, a mixture of air and opaque or transparent liquid, is continuously drawn through the conductor 2. This is done by connecting one end of the conductor 2 to a pipe 51, which, in turn, is connected with the intake side of the pump 52. The outlet side of the pump is connected through a pipe 53 to a separating tank 54.

Leading from the outward side of the separating tank, 54, is an air conducting pipe 55, having a metering jet 55a therein. Leading from the lower portion of the separating tank 54 is a liquid pipe 56, also having a metering jet 56a. The two pipes connect to a common tube 57, communicating with the fluid conductor 2. The air metering jet 55a is considerably smaller than the liquid metering jet 56a. The proportional sizes of the metering jets are such that the proportions of air and liquid in the conductors 2 are of the right amount. The air tends to collect in bubbles, which act upon the light issuing from the neon or gas tubes in such a manner as to vary its appearance. As the bubbles are traveling from one end to the other of a tube, it gives the appearance of a corresponding flow of the light. Thus, the light appears to flow from one end to the other of the tube.

In Fig. 8, the neon tubes 1 are arranged to form more conventional letters or characters. In this structure the characters are in the form of roman or block lettering in which the neon tubes form the borders thereof. Positioned over the neon tubes are fluid containers 61, which embrace the entire area of the letters, as shown best in Figs. 8 and 10. The lower end or ends of each fluid con-

tainer 61 is joined to a common main supply pipe 62. Each of its upper ends is connected to a common outlet pipe 63.

This structure may be used with any of the foregoing described circulating mechanisms. In addition, the conductors may be used to form an attractive day-time sign which covers up the unsightliness of the neon or gas tubes when these tubes are not in use. This is accomplished by filling the containers 61 with an opaque or translucent liquid and keeping the liquid there during the day-time.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, and certain modifications thereof, I do not wish to be limited to this particular construction, combination and arrangement, nor to the modifications, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a sign structure, a sign element comprising an outline forming illuminable gas tube and a removable fluid conduit only partially embracing said tube at one side only.

2. In a sign structure, a sign element comprising an outline forming illuminable gas tube and a removable fluid conduit only partially embracing said tube, a fluid circulating system, including said fluid conduit, and means for circulating a fluid therethrough.

3. In a sign structure, an illuminating means arranged to form characters, a fluid container only partially embracing said illuminating means and forming a character similar to that formed by said illuminating means.

4. In a sign structure, an outline forming tubular illuminating means, a removable fluid conductor coextensive therewith, a circulating system joining the ends of and including said fluid conductor, a plurality of immiscible liquids in said system, means for circulating said fluid, and means for separating said fluids, whereby the fluids passing through said fluid conductor are distinguishable one from the other.

5. In a sign structure, an outline forming illuminating means, a fluid conductor partially embracing said illuminating means, a fluid pumping system connected with said fluid conductor, and means for reversing the flow of the fluid through said conductor.

6. In a sign element, an outline forming illuminable gas tube, a fluid conductor, said fluid conductor having a substantially crescent shaped cross section so as to partially embrace said gas tube.

7. In a sign structure, a character forming gas filled illuminable tube, a fluid conductor following the path of said illuminable tube, said tube having an annular cross section, said fluid conductor having a crescent shaped cross section and partially embracing said gas tube.

OSCAR LEE SANDERS,