

Oct. 16, 1934.

I. I. LEVENSTEIN
ELECTRIC SIGN SYSTEM

1,977,191

Filed Aug. 11, 1932

2 Sheets-Sheet 1

Fig. 1.

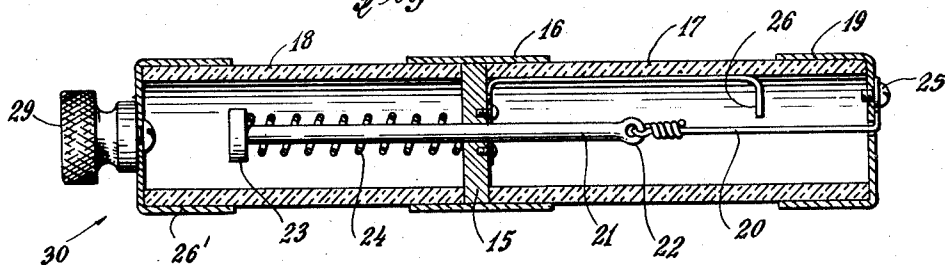


Fig. 2.

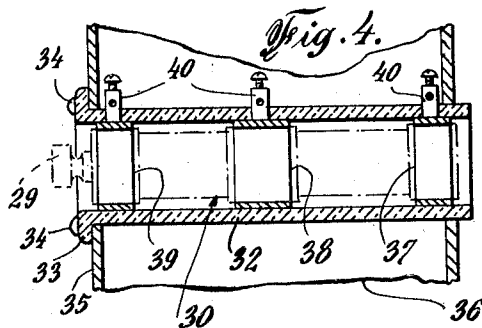
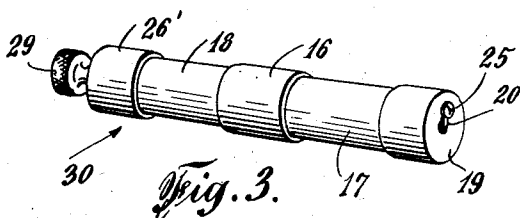
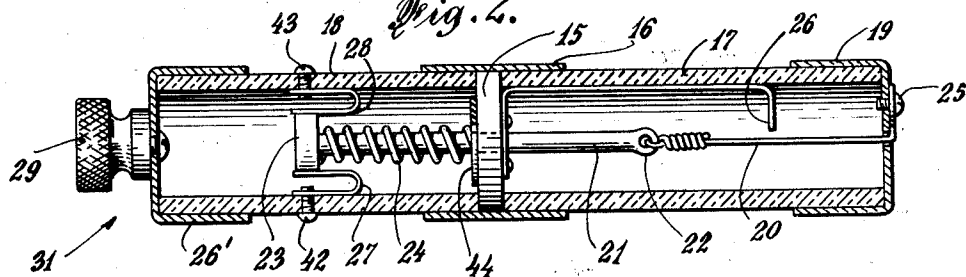


Fig. 5.

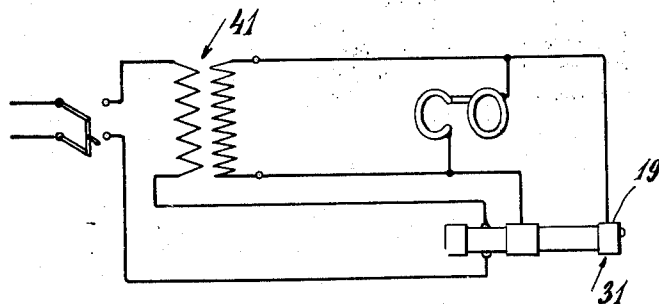
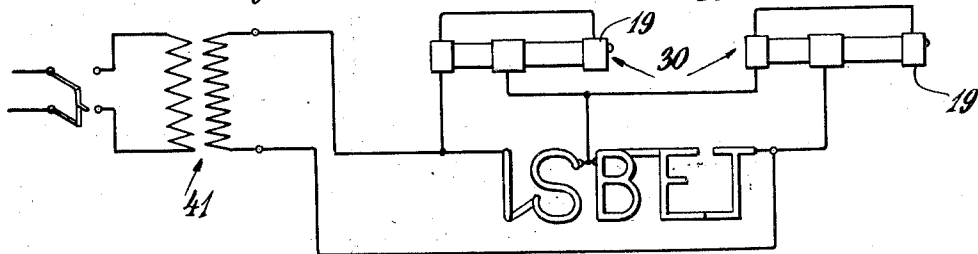


Fig. 6.

INVENTOR
IRVING I. LEVENSTEIN
BY
[Signature]
ATTORNEY

Oct. 16, 1934.

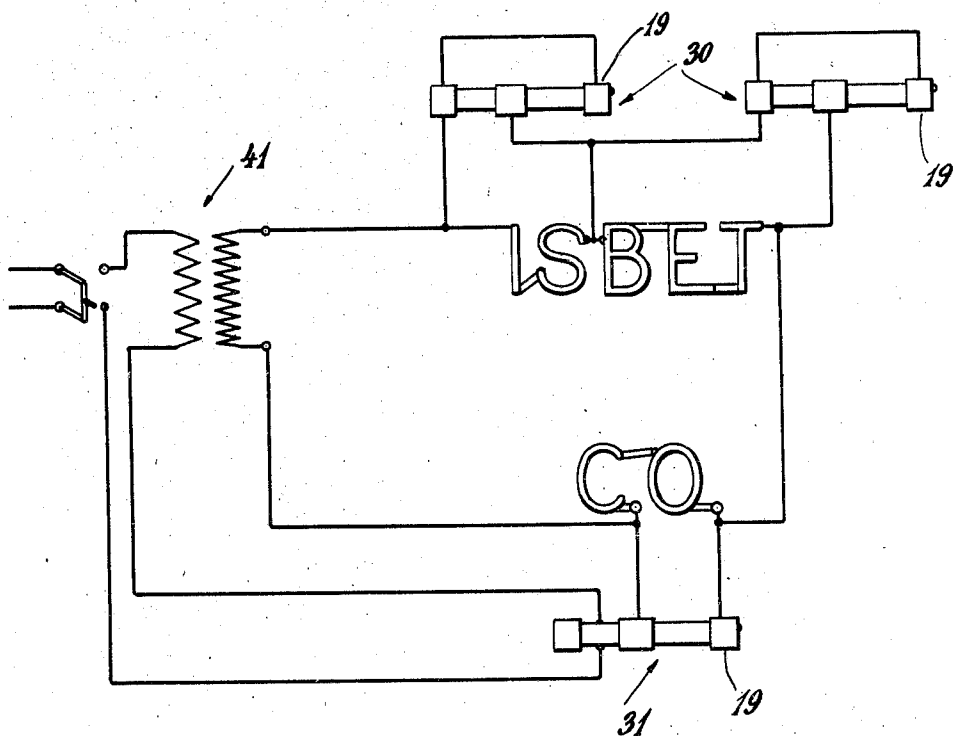
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2 Sheets-Sheet 2

Fig. 7.



INVENTOR
IRVING I. LEVENSTEIN
BY *[Signature]*
ATTORNEY

UNITED STATES PATENT OFFICE

1,977,191

ELECTRIC SIGN SYSTEM

Irving I. Levenstein, Brooklyn, N. Y.

Application August 11, 1932, Serial No. 628,360

3 Claims. (Cl. 200—117)

The present invention relates to electric sign systems of the type employing the discharge of a high tension current through a gas contained in hermetically sealed glass tubes which are fashioned to form letters of the alphabet or diagrammatical representations, and in particular to sign systems of the class mentioned embodying automatic switching devices designed to overcome various objectionable difficulties ordinarily encountered in the operation of what are commonly known as neon tube electric signs.

An object of my present invention is to provide novel means for use in connection with electric signs of the character described, adapted to automatically shunt the terminals of any lamp section upon the breaking of the glass tube thereof, to permit operation of the remainder of the sign.

Another object of this invention is to provide improved and novel means for use in connection with signs of the type mentioned, adapted to automatically open the primary circuit in the event there shall occur a break in the high tension circuit from any cause whatsoever.

Another object of this invention is to provide a novel and improved electric sign system of the character mentioned embodying means adapted automatically to insure the continuity of the high tension circuit.

A further object of my present invention is to provide an improved electric sign system of the type mentioned embodying a combination of the functions herein mentioned.

Another object of my invention is to provide novel automatic switching devices which are operable by the action of high tension currents, and which are constructed in such form to be easily adapted for use in connection with electric signs of the character mentioned.

A further object of this invention is to provide novel and improved means of the character mentioned which is simple in construction, original in its mode of operation, automatic and certain in its action, cheap to manufacture, and easy, convenient and efficient to use.

To attain these objects, I provide in connection with electric sign systems of the character mentioned, devices consisting essentially of a switch, one element of which is held drawn back by a taut fuse member against the action of a spring, and of an electrode mounted in spaced relation with said fuse wire member to form a spark gap therewith. The operation of such devices depends upon a spark jumping the gap when there is a break in the high tension circuit, thereby causing the fuse member to melt and break, thus

releasing the switch element aforesaid, which thereupon will automatically be moved by action of the spring into position either to make or break a circuit depending upon the switch construction and its hook-up in the system.

For instance, the gap may be bridged across the terminals of a lamp tube unit, the resistance of the gap being initially set to be a little greater than the resistance of said tube unit. In ordinary operation, the electric discharge of the high tension current will pass through the gas-filled tube until it so happens that said glass tube breaks. Whereupon, a spark will jump the said gap and thus maintain continuity of the high tension circuit. The heat of the spark across said gap will cause the fuse member to melt and break, whereupon the switch element becoming released will snap into contact with another switch element to cause a shunt of the terminals of the broken tube, thus maintaining continuity of operation of the sign until the broken tube can be replaced.

As another instance, the gap may be bridged across the high tension terminals of the transformer which is a component of such sign systems, while the switch elements of said device are interposed in the primary circuit and normally maintaining a closed circuit while the fuse element is intact. In such hook-up should a break occur anywhere in the high-tension circuit, it being remembered that initially the resistance of the gap is set to be a little greater than the resistance of the high tension circuit across which it is connected, a spark will jump the said gap causing the fuse element to break whereupon the switch element originally held back against the action of a spring, will automatically become released and move to its other extreme position thereby opening the primary circuit.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein be deemed illustrative and not restrictive, and that the patent shall cover whatever features of patentable novelty exist in the invention disclosed, reference being had to the appended claims rather than to the specific description herein to indicate the scope of the invention.

In the accompanying drawings, forming a part of this application, similar characters of reference indicate corresponding parts in all the views.

Fig. 1 is a central longitudinal section of a

preferred embodiment of my present invention for use in connection with sign systems of the character herein mentioned, adapted to maintain the continuity of the high tension circuit in the event of a break occurring therein.

Fig. 2 is a central longitudinal section of a preferred embodiment of my present invention for use in connection with sign systems of the character herein mentioned, adapted to open the primary circuit in the event of a break in the high tension circuit.

Fig. 3 is a perspective view showing pictorially the outer appearance of contrivances otherwise shown in Fig. 1.

Fig. 4 is a fragmentary section through a sign, showing in section an adapter to receive the contrivances shown in Figs. 1 and 2.

Fig. 5 is a wiring diagram or hook-up showing an improved sign system of the class mentioned, embodying means adapted to insure continuity of the high tension circuit.

Fig. 6 is a wiring diagram showing an improved sign system of the class mentioned, embodying means adapted to open the primary circuit in the event of a break in the high tension circuit.

Fig. 7 is a wiring diagram showing an improved sign system of the type described, embodying the features of the systems aforesaid.

Before entering into the details of these novel systems, I will first describe the automatic switching devices upon which such systems depend.

In the drawings, the numeral 15 designates a metal washer which is secured within and intermediate the ends of a sleeve 16. The tubular elements 17 and 18, which are of insulating material, are demountably secured, one within each end of the sleeve 16, up against the washer 15. At the remote end of the tubular element 17, is secured a metal cap 19, in which, through a central hole can pass a fuse wire member 20 to lie axially within the tubular element 17.

Through the washer 15, is slidably mounted a rod 21, of insulating material, having its end which protrudes within the tubular element 17, formed into an eye 22, about which is secured one end of the fuse wire 20, and secured at the other end of said rod 21, which lies within the tubular element 18, is a metal switch element 23. A spring 24, sets on the rod 21, between the washer 15, and the switch element 23. The outer end of the fuse wire 20, is secured about a small screw 25, which is threadedly engaged in the cap 19.

An electrode 26, is secured to the metal washer 15, to lie within the tubular element 17, and be in spaced relation with the taut fuse wire 20, so as to form a spark gap therewith. In the set up of the devices shown in Fig. 1, and Fig. 2, the rod 21 is drawn into the tubular element 17, against the action of the spring 24; it being intended that upon the breaking of the fuse wire 20, in the event a spark is caused to jump the spark gap aforesaid, that the switch element 23, be actuated into position either to make a circuit by coming in contact with the cap 26', (in Fig. 1) secured at the remote end of the tubular element 18, or else, as in the set up in Fig. 2, to open a circuit by causing a break between the metal spring straps 27 and 28. To provide a handle for these devices, an insulating knob 29, is secured onto the cap 26'.

Hereinafter, the contrivance shown in Fig. 1, is generally designated by the numeral 30, and that shown in Fig. 2, by the numeral 31. It is

to be noted that in appearance, they are very similar to the common form of cartridge fuse, except for the middle sleeve 16.

In construction of the sign, I include adapters as shown in Fig. 4, which are comprised essentially of a porcelain tube 32, having a flange 33 at one end thereof, wherein screws 34 enter to mount the adapter onto the front side 35 of the sign 36. Within this tube 32, in spaced relation are mounted three tube segments, namely, 37, to engage the cap 19; 38, to engage the sleeve 16, and 39, to engage the cap 26'. Provision for making electrical connections to these three tube segments, is had at the terminal posts designated by the numeral 40.

As to the operation of my novel systems, I will first set forth individual functions, and then a system of combined functions.

In the hook-up shown in Fig. 5, the sign "ISBET" of the class mentioned, is made up of two tube sections, namely, "IS" and "BET". These sections are connected in series across the high tension terminals of the transformer 41. It is to be noted that in the contrivance 30, the switch element 23 and the cap 26', are to be together considered as a switch, while the electrode 26 and the fuse wire 20, are as aforesaid, to act as a spark gap. In this hook-up, the switch elements 23 and 26', are respectively connected to the spark gap elements 26 and 20, and they are respectively connected across the terminals of the tube section "IS". A second contrivance 30 is in like manner connected across the terminals of the lamp section "BET". For as many sections of sign tube any particular electric sign of the class described may have, so many of the contrivances 30 do I connect up in the system. Holding in mind that the resistance of the gap between elements 26 and 20 is a little greater than the resistance of the tube section across which it is connected, in the normal operation of the sign, the discharge of the current will be through the lamp tube section, unless the glass thereof becomes broken, whereupon the current will cause a spark to jump across the gap aforesaid thereby retaining continuity of the high tension circuit. However, the heat of the spark will melt and break the fuse wire 20, whereupon the switch elements 23 and 26' will come into permanent contact thereby shunting the terminals of the broken tube section and thereby effectively insuring continuity of the high tension circuit permitting the remainder of the sign to operate.

In the hook up shown in Fig. 6, I connect the spark gap elements 20 and 26, across the high tension terminals of the transformer 41; the resistance of said spark gap being a little greater than the resistance of the high tension lamp circuit "CO". Interposed in the primary circuit is the switch comprising the spring straps 27 and 28 and the metal member 23 which is normally in contact with both said straps, thereby maintaining a closed primary circuit until there occurs a break in the high tension circuit, whereupon the fuse wire element 20 will melt and break because of a spark which will jump the gap in such instance, and thereby the metal switch element 23 in being released to move, will disengage from its contact with the straps 27 and 28, thus opening the primary circuit. Connections to these spring straps are made at the binding posts 42 and 43, respectively therefor provided, while metal element 23 is insulated from the washer 16 by an insulating washer 44, in order to keep the

switch elements electrically separate and apart from the spark gap elements. The fuse wire 20 may be replaced and the contrivances used again.

In the hook up shown in Fig. 7, I connect contrivances 30 across each of the lamp units of the system except one which is connected in combination with the contrivance 31. In the instance shown, the lamp sections "IS" and "BET" are each associated with contrivances 30, while the lamp section "CO" is associated with a contrivance 31. In this system, should either of the tubes break of the sections "IS" or "BET", then such broken section would become shunted by the action of the contrivance 30 associated therewith, as heretofore explained, and should the glass of the tube section "CO" become broken, then by virtue of the operation of the contrivance 31 associated therewith, the primary circuit of the system would be opened. Such a system would protect the transformer and permit operation of the remainder of the sign even if one or several tube sections become broken, except should the section which is associated with the contrivance 31 break, whereupon the entire sign ceases to operate. The probability, however, of the happening of such contingency becomes less and less, as the number of the tube sections in the entire sign is increased.

Having described my invention, I claim:—

1. In a switching device of the type operable by a high tension current, the combination of a tubular fuse case, a switch mounted within the case; said switch having a moveable member adapted upon movement thereof to operate the switch, a fusible element fixed within the case and secured to the moveable member of the switch, an electrode mounted within the case spaced from the fusible element; the fusible element being adapted to be broken intermediate its ends upon passage of a high tension current between the electrode and the fusible element, a flexible member mounted within the case to cause a tension in the fusible element and adapted to shift the moveable member of the switch upon the breaking of the fusible element; said flexible member being in a stressed condition while the fusible element is intact, and metal terminals mounted on the exterior of the case and electrically connected to the switch, the fusible element and to the electrode respectively, whereby the device is adapted to be mounted in a fuse adapter.

2. In a switching device of the type operable by a high tension current, the combination of a

tubular fuse case, a switch element fixed within the case, a second switch element movably mounted within the case, adapted in its remote positions to be respectively in and out of contact with the fixed switch element, a fusible element fixed within the case and secured to the moveable switch element, adapted to maintain the moveable switch element in one of its remote positions, an electrode mounted within the case in spaced relation with the fusible element; the fusible element being adapted to be broken intermediate its ends upon passage of a high tension current between the electrode and the fusible element, a flexible member mounted within the case to cause a tension in the fusible element and adapted to shift the moveable switch element upon the breaking of the fusible element; said flexible member being in a stressed condition while the fusible element is intact, and metal terminals mounted on the exterior of the case and electrically connected to the switch elements, the fuse element and to the electrode respectively, whereby the device is adapted to be mounted in a fuse adapter.

3. In a switching device of the type operable by a high tension current, the combination of a tubular fuse case, a switch element fixed to the case, a second switch element moveably mounted within the case, adapted in its remote positions to be respectively in and out of contact with the fixed switch element, a metal cap having a hole therein, removably mounted on an end of the case, a fusible element slidably mounted through the hole in the cap; the interior end of the fusible element being removably secured to the moveable switch element, and its exterior end being removably secured to the cap, whereby the moveable switch element is maintained in one of its remote positions, an electrode mounted within the case spaced from the fusible element; the fusible element being adapted to be broken upon passage of a high tension current between the electrode and the fusible element, a flexible member mounted within the case, adapted to shift the moveable switch member upon the breaking of the fusible element; said flexible member being in a stressed condition while the fusible member is intact, and metal terminals mounted on the exterior of the case and electrically connected to the interior components of the device, whereby the device is adapted to be mounted in a fuse adapter.

IRVING I. LEVENSTEIN.

55	130
60	135
65	140
70	145
75	150