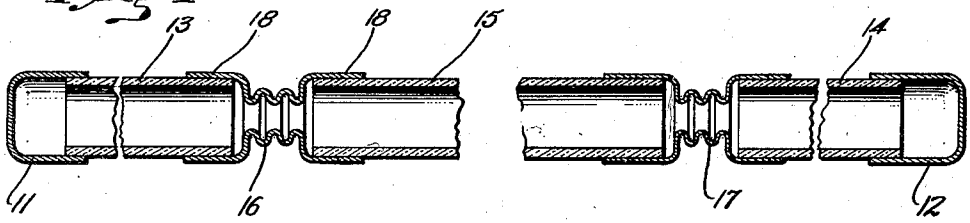
Dec. 15, 1936. T. C. PROUTY 2,064,354

MULTIPLE UNIT TUBE

Original Filed Oct. 11, 1930

Fig. 1



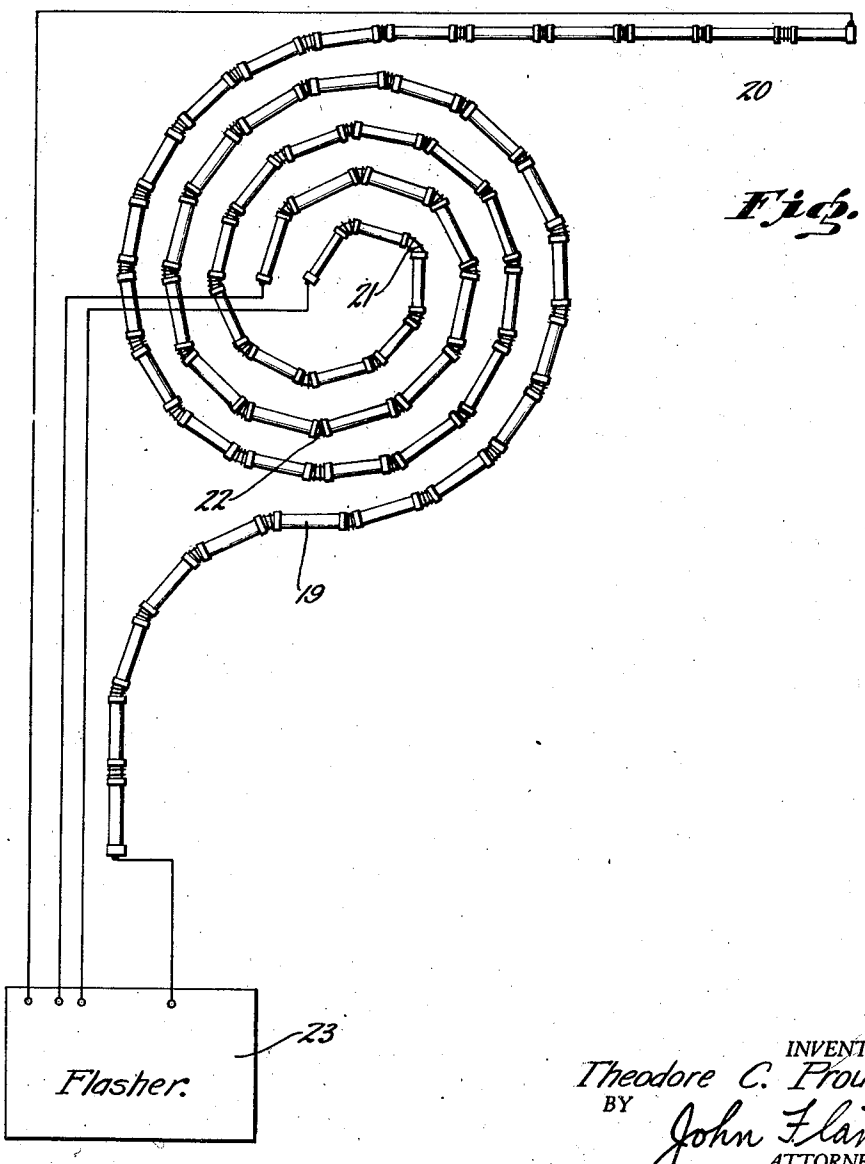


Fig. 2

INVENTOR.
Theodore C. Prouty.
BY
John Flam
ATTORNEYS.

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MULTIPLE UNIT TUBE

Theodore C. Prouty, Hermosa Beach, Calif., assignor to Metlox Corporation, Ltd., Manhattan Beach, Calif., a corporation of California

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Renewed June 23, 1936

6 Claims. (Cl. 176—122)

This invention relates to a luminous display device, and especially to a changeable illuminated sign or character.

Luminous tubes utilizing a gaseous filling are now commonly used. These tubes usually employ an inert gas at low pressures, such as the noble monatomic gases or mercury, which are energized by appropriate sources of electrical energy. Although such tubes can be connected as individual elements in a changeable device operated by a flasher mechanism, yet they are not so well adapted for this purpose as ordinary incandescent globes. The reason for this is that the tubes commonly utilized are ordinarily long for the sake of economy; and if made short to be comparable in size with an incandescent globe, the cost of terminals, connections and other accessories would be quite high.

It is one of the objects of my invention to provide a luminous tube structure that, while it employs a continuous gaseous column, can yet be sectionally energized as desired. In this way, only a definite portion of the whole tube can be rendered luminous, and the portion so rendered luminous, can be altered by appropriate circuit controllers.

To accomplish this result, I employ a tubing, either as a single length or as a network, with intermediate connectors or electrodes. The energy for illuminating any section or sections of the tube is supplied through any set of electrodes either at ends or at intermediate places, the tube portions between electrodes being made as short as desired for effective flashing.

Indeed, I may preferably so construct the intermediate electrodes as to make them flexible as by the aid of yielding metal tubing, whereby a length of tubing can at will be bent to conform to a definite configuration. Thus a single tube can be used to provide a flashing border, the tube being bent at the electrode points to conform to a desired pattern. It is accordingly another object of my invention to provide a conformable luminous tube.

By appropriate arrangement of the tube network, and by proper circuit controls, any portion of a network can be illuminated to form in succession any one of a number of characters or letters. In this way, a "speaking" sign can be easily constructed. Accordingly it is still another object of my invention to provide a changeable character by the aid of a luminous tube network.

A highly important advantage of this arrangement resides in the ready adaptability of a length of standard tubing to the construction of any desired pattern.

My invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of my invention. For this purpose I have shown a form in the drawing accompanying and forming part of the present specification. I shall now proceed to describe this form in detail, which illustrates the general principles of my invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of my invention is best defined by the appended claims.

Referring to the drawing:

Figure 1 is a diagrammatic sectional view of a tube embodying my invention, parts being broken away to reduce the length of the figure;

Fig. 2 is a diagram showing how tubes can be arranged at will to present a pattern that can be sectionally flashed;

In the construction of the tube, I may utilize any appropriate form of electrodes therewith. For example, in Fig. 1 I show electrodes 11 and 12 at the extremities of the external type. These electrodes are made in the form of a cap or thimble, telescoping over the end sections 13, 14 of the tube. These electrodes can be sealed in a manner now well understood so as to provide an air tight cap, and electrical energy can be led to these electrodes as by appropriate socket arrangements in which the electrodes are accommodated.

In tubes now common in this art, the glass column extends between the tube extremities, and the whole column is luminous or dark. The filling of the tube is usually neon, argon, helium or the like, with or without a few drops of mercury, at a pressure of from about 4 to 12 millimeters of mercury. However, in the present arrangement, I provide a plurality of tube sections, such as 13, 14, 15, joined together by intermediate flexible electrode structure, such as 16, 17. Each of these structures can be made to telescope over the adjacent tube ends, and is preferably flexible, as by being made from thin copper tubing constricted between the sealed portions 18.

In order to increase the flexibility of the electrode structures, if desired, the constricted portions 16, 17 can be made in the form of bellows; but ordinarily, sufficient flexibility can be obtained without any such expedients.

The tube structure just described can be made up of any desired number of sections such as 13, 14, 15, depending upon the character of the

display desired. For example, I show in Fig. 2, a pair of tubes 19, 20 constructed in the manner described in connection with Fig. 1, and bent at the electrode joints such as 21, 22, to form a double spiral, as in a border decoration scheme. A flasher 23 can be connected to any or all of the electrode members (either intermediate or end members) so as to control the sequence of energization of the tube elements comprising tubes 19, 20. If, for example, an energizing potential is applied between any two intermediate electrode members, the tube will be illuminated only between these members. Of course, it is to be understood that the source of energy supplied to the tube sections is such as to produce the desired currents flow. This can be done by the aid of constant current transformers, as is now well understood in this art.

The flasher mechanism 23 can be designed to provide any desired sequences of illumination in any combination of sections that comprise tubes 19, 20.

I claim:

1. A luminous tube comprising a series of tubular sections forming a continuous gas column, and flexible tubular electrode structures joining the sections.

2. A luminous tube comprising a series of tubular sections and means flexibly joining said sections together and forming thereby a continuous luminous tube column.

3. A luminous tube comprising a series of alternate transparent tubes and metallic flexible tubular joints, said series forming a continuous column of gas.

4. An electric discharge lamp device comprising an elongated glass container, electrodes sealed in the respective ends thereof, a gaseous atmosphere therein, said container having a flexible, metal section along the length thereof and intermediate said electrodes.

5. A gaseous electric discharge lamp device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, said container consisting of a plurality of glass tubes surrounding the discharge path between said electrodes and a tube having corrugated walls interposed between and joining the adjacent ends of said glass tubes.

6. A gaseous electric discharge lamp device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, said container consisting of a plurality of glass tubes surrounding the discharge path between said electrodes and a metal tube having corrugated walls interposed between and joining the adjacent ends of said glass tubes.

THEODORE C. PROUTY.