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LE ROY H. DEY ET AL

2,142,633

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Fig. 2

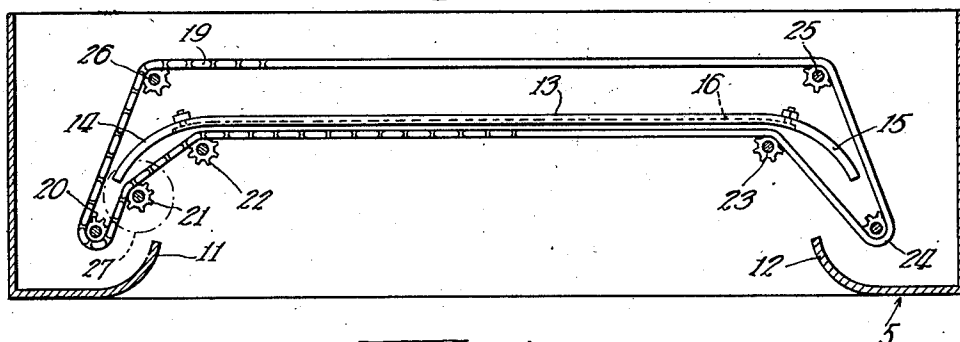


Fig. 1

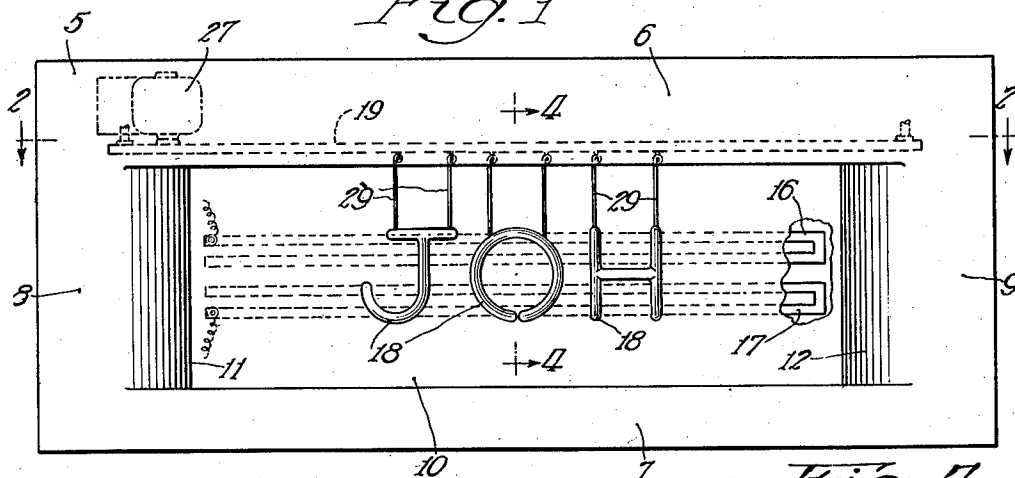


Fig. 4

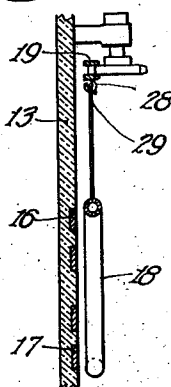
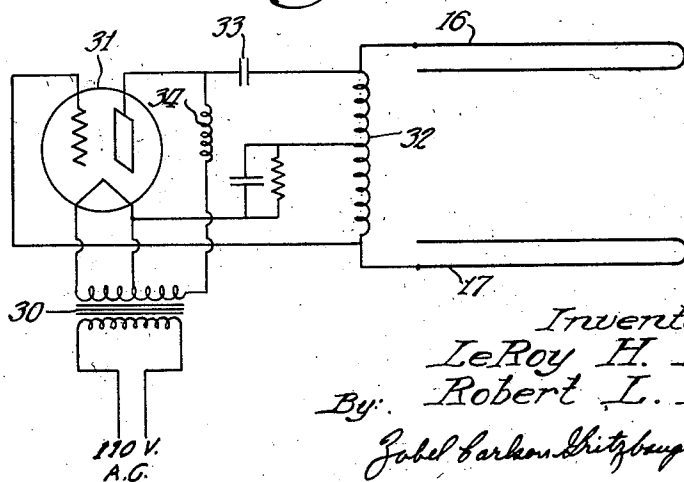


Fig. 3



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Application October 4, 1937, Serial No. 167,258

7 Claims. (Cl. 40—130)

The present invention relates to signs and more particularly to a novel construction whereby a readily changeable sign made up of gaseous conduction tubes may be had without the necessity of dangerous electrical connections such as are usually associated with such tubes.

It is well known that, at ordinary commercial frequencies of power, it is necessary to supply the tubes with a relatively high voltage in the neighborhood of thousands of volts in order to obtain proper working of the tubes. By increasing the frequency of the electrical energy, the voltage necessary to cause excitation of the gas within the gaseous conduction tubes may be reduced to a sufficiently low value as to make it fairly safe. Furthermore, it is possible to excite the gaseous conduction tubes by placing them in close proximity to radiating elements which are supplied with electrical energy at high frequency.

The present invention takes advantage of this latter feature to provide a sign wherein no electrical connections are made to the tubes themselves and the arrangement is such that it is possible to change the tubes rapidly without disturbing the source of electricity in the least and without breaking any electrical connections. The arrangement is such that the tubes are taken off when they are not excited and are only excited at the time they are visible in the travelling display.

The features and advantages of the invention will appear more fully as the description proceeds in connection with the accompanying drawing. It is to be understood, however, that the drawing and description are illustrative only and are not to be taken as limiting the invention except in so far as it is limited by the claims.

In the drawing—

Fig. 1 is a view in front elevation of a sign embodying the invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a wiring diagram illustrating the electrical connections for the radiating elements; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Referring now in detail to the drawing, the present invention is embodied in a sign which is contained within a frame 5 rectangular in construction and having top and bottom front panels 6 and 7 and end panels 8 and 9 defining an opening 10 through which the display is visible. For convenience in hiding constructional features of the device from view, the end panels 8 and 9 have

their inner edges turned inwardly as shown at 11 and 12. Within the frame 5, there is mounted a sign background plate 13 which may be constructed of any suitable material which is an insulation for electrical current. This background plate 13 extends the full length of the opening 10 and is curved toward the front of the frame at both ends as shown at 14 and 15 so as to cooperate with the portions 11 and 12 in preventing the operating parts of the sign from being visible through the opening 10. The background plate 13 has two elongated U-shaped metal strips 16 and 17 embedded therein, these strips extending substantially the full length of the opening 10. The strips 16 and 17 are adapted to act as radiators for radiating high frequency electrical energy to energize gaseous conduction tubes such as those shown at 18 in Figs. 1 and 4. A conveyor comprising an endless chain 19 is mounted in the frame behind the panel 6 and is trained around a series of sprocket wheels 20, 21, 22, 23, 24, 25, and 26. The sprocket wheel 21 is a drive sprocket and is driven by a motor 27 also mounted in the frame behind the panel 13. The back of the frame 5 may desirably be left open or temporarily closed in order that access may be had to the conveyor 19. The tubes such as 18 are detachably carried by conveyor 19.

As an example of one method of suspending the tubes from the conveyor 19, suitable hooks 28 may be provided on the conveyor at spaced intervals and hangers 29 may be fixed to the tubes 18 in any suitable fashion and connected to the hooks 28 for detachably supporting the tubes 18 from the conveyor 19. Since the tubes, when they are travelling between the sprocket wheels 25 and 26 at the back of the machine, are completely away from the radiating elements 16 and 17 and thus deenergized, they may be removed and replaced with other tubes while the conveyor is travelling or by stopping the conveyor if desired. Thus the display through the opening 10 may be varied at the will of the operator by the simple expedient of taking off gaseous conduction tubes that have no electrodes or electrical connections and replacing them with similar tubes.

The radiating elements 16 and 17 are excited from an oscillator, the circuit of which is shown in Fig. 3. The specific construction of the oscillator forms no part of the present invention. Hence we will not attempt to describe its operation in detail. It consists primarily of a transformer 30, an oscillator tube 31 of any improved design, the output of the oscillator being connected across a so-called tank coil 32, and the

strips 16 and 17 being connected to the opposite ends of the coil. We have found that the return loop or U-shaped construction of the radiating strips gives the best results. A blocking condenser 33 is inserted to keep out the low frequencies from the tank coil and a choke coil 34 may be provided in the plate circuit of the oscillator as shown.

It is believed to be clear from the foregoing description that we have provided a simple and economical construction of a sign whereby traveling effects may be obtained and complete interchangeability may be accomplished with gaseous conduction tube structures. The construction is such that no high voltage is associated with the gaseous conduction tubes at the point where they are to be interchanged.

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

1. A sign of the character described comprising a source of high frequency oscillations, a plurality of conducting elements connected to the source and arranged in parallel relation, a plurality of gaseous conduction tubes, and supporting and moving means for said tubes adapted to continuously move the tubes across the radiating elements in succession whereby to successively light the several tubes, said tubes having no electrical connection to the oscillator or the radiating elements.

2. A sign of the character described comprising an oscillator, a plurality of elongated conducting strips connected to the output of the oscillator and arranged in spaced parallel relation, a support for said strips forming a background for the sign, a conveyor travelling lengthwise of said strips and individual gaseous conduction tubes carried by said conveyor in proximity to said strips whereby to be illuminated by the high frequency electrical oscillations delivered to said strips, and means for driving said conveyor.

3. A sign of the character described comprising an oscillator, a plurality of elongated conducting strips connected to the output of the oscillator and arranged in spaced parallel relation, a support for said strips forming a background for the sign, a conveyor travelling lengthwise of said strips and individual gaseous conduction tubes carried by said conveyor in proximity to said strips whereby to be illuminated by the high frequency electrical oscillations delivered to said strips, and means for driving said conveyor, said strips being substantially U-shaped and being spaced one above the other upon said supporting means.

4. A sign of the character described comprising

an oscillator, a plurality of elongated conducting strips connected to the output of the oscillator and arranged in spaced parallel relation, a support for said strips forming a background for the sign, a conveyor travelling lengthwise of said strips and individual gaseous conduction tubes carried by said conveyor in proximity to said strips whereby to be illuminated by the high frequency oscillations delivered to said strips, and means for driving said conveyor, said conveyor having means for detachably securing the tubes thereto.

5. A sign of the character described comprising a frame comprising top and bottom panels and end panels, a stationary sign background mounted in said frame and visible through the opening between said panels, elongated conducting strips carried by said background extending substantially throughout the length of the opening between said panels, means for supplying high frequency oscillations of electrical energy to said strips, and means for supporting and moving a series of gaseous conduction tubes lengthwise in front of said background and in close proximity to said strips whereby to continuously illuminate the tubes as they pass the strips.

6. A sign of the character described comprising a frame comprising top and bottom panels and end panels, a stationary sign background mounted in said frame and visible through the opening between said panels, elongated conducting strips carried by said background extending substantially throughout the length of the opening between said panels, means for supplying high frequency oscillations of electrical energy to said strips, and means for supporting and moving a series of gaseous conduction tubes lengthwise in front of said background and in close proximity to said strips whereby to continuously illuminate the tubes as they pass the strips, said last named means comprising a conveyor and means for detachably mounting gaseous conduction tubes thereon.

7. A display sign of the character described, comprising a panel of insulating material having two metal strips embedded therein, a high frequency oscillator having its output leads connected to said strips, an endless conveyor, a plurality of individual gaseous conduction tubes detachably mounted on said conveyor, supporting and driving means for said conveyor guiding and moving it in a path about said panel whereby to move the tubes carried by the conveyor around said panel in close proximity to said strip at least at one side of the panel.

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