June 12, 1934. H. S. INGOLD 1,962,347

BUSHING FOR LUMINOUS DISPLAY TUBES

Filed Dec. 19, 1930

Fig. 1

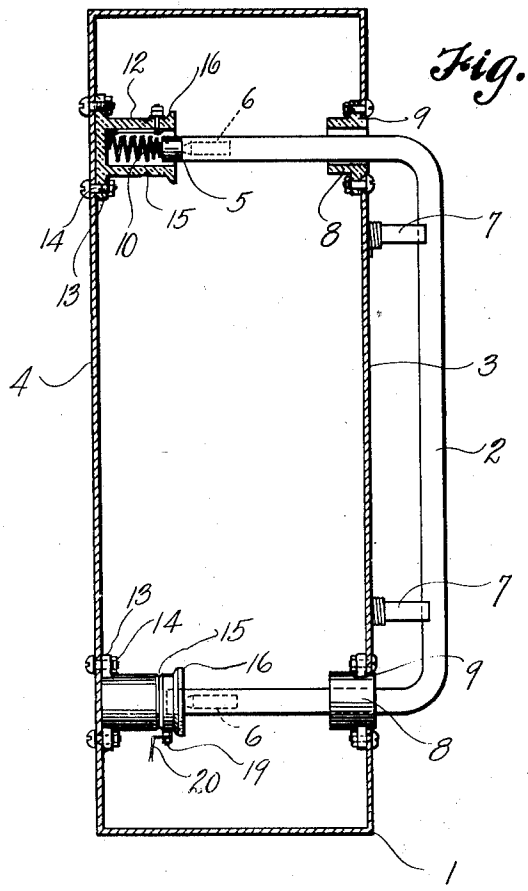


Fig. 3

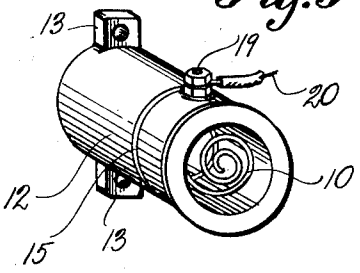
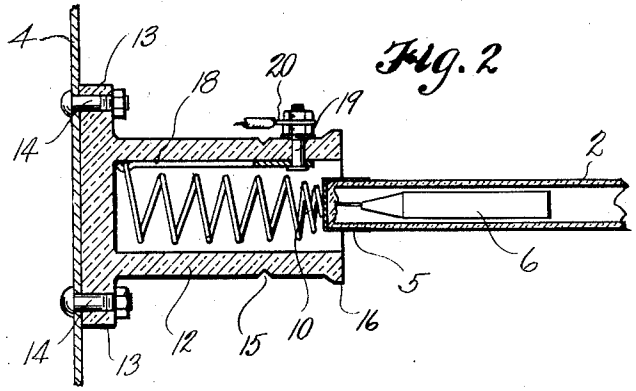


Fig. 2



INVENTOR
HAROLD S. INGOLD
BY
Cook & Robinson
ATTORNEY

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BUSHING FOR LUMINOUS DISPLAY TUBES

Harold S. Ingold, Seattle, Wash., assignor to Electrical Products Corporation of Washington, a corporation of Washington

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2 Claims. (Cl. 173—328)

This invention relates to improvements in mounting bushings for luminous tubes such as are now extensively used for signs and displays generally referred to in trade as "neon signs"; the present bushings serving to mount the terminal ends of the tubes as elements through which they may be connected in an electric circuit for illuminating the tube.

It is now common practice to project the terminal ends of such luminous display tubes into porcelain bushings of tubular character, that are fitted or inserted within openings provided therefor in a sign mounting base or panel, or what may be termed a "supporting backing". Within the bushings, as now used, are spring contacts against which the metallic terminals at the ends of the tubes are seated. The contact element of each bushing is electrically connected, by means extended through the bushing wall, with a supply current, and it is the function of the contact to expand, and to thereby automatically maintain the electrical connection with the terminal of the tube.

Where such bushings, as heretofore have been used, are applied in the face of the mounting panel without being properly protected, it is quite obvious that rain water, snow or water of condensation collecting on the tube, will pass along the tube and will flow into, or will be blown into the bushing about the tube end. Any such collection of water within the bushing is very apt to and frequently does permit short circuiting through the tube wall to the electrode contained therein, with a resultant puncturing of the glass tube which renders it useless.

The present invention has for its principal object to overcome the above-described disadvantages resultant to use of tube bushings in the sign mounting panel, and it contemplates locating the bushings, which contain the terminal ends of the tubes, in a position protected from weather or rain where water or moisture cannot collect. The invention also contemplates the provision of a bushing of novel construction which prevents moisture, which might from any cause, collect on the walls of the bushing, from flowing to or entering the open end thereof.

More specifically stated, the present invention resides in the provision of an insulating, terminal bushing of novel construction designed to be located on an inner or protected wall of a sign supporting housing, and having an encircling drainage groove and a rim flange to prevent flow of water or moisture into the open end of the bushing. The bushing also is to include a spring contact located well toward its open end so as to provide for electric connection with the tube terminal without requiring that the tube be extended into the bushing to an extent sufficient to enclose the electrode containing portion, thereby eliminating the possibility of short circuiting from the bushing to the electrode through the glass wall of the tube.

Other objects of the invention reside in the various details of construction, and in the combination of parts, and in their use, as will hereinafter be fully described.

In accomplishing the objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing, wherein—

Fig. 1 is a cross sectional view of a luminous tube sign in which the tube terminals are mounted by bushings and supporting structure constructed and assembled in accordance with the present invention.

Fig. 2 is an enlarged sectional view of one of the supporting bushings embodied by this invention, particularly illustrating the encircling drainage groove and flange; also showing the coiled spring contact contained within the bushing.

Fig. 3 is a perspective view of the bushing.

Referring more in detail to the drawing—

1 designates, in its entirety, the backing, or what may be termed the "supporting housing" for the sign, and 2 designates one of the luminous tubes which forms a character of the sign. The backing comprises a closed housing, preferably of sheet metal construction and including front and rear walls 3 and 4, respectively, in spaced apart relation. The present illustration is that of a single face sign, that is, the sign support has sign forming characters on but one side thereof, but it is readily understood that a display might be placed on both sides of the housing, if it was so desired, and this is immaterial in so far as the present invention is concerned.

The sign forming character 2 is the usual gaseous filament tube of glass, sealed at its opposite ends and provided at these sealed ends with terminals in the form of metallic caps 5, as in Figure 2, which are applied over the tube ends and are connected electrically with electrodes 6 of copper or other suitable material, contained within the tube ends. The display characters of the sign are mounted somewhat forwardly of the housing wall 3 by means of insulating supports 7 which may be of glass or other suitable material, and which are mounted on the wall 3 in the

customary way. The end portions of the tube are turned inwardly and are extended through open bushings 8 that are fitted within openings 9 provided therefor in the wall 3. The terminal end caps 5 of the tube are seated against contact springs 10 within the bushings 12, presently described in detail, and which are fastened within the housing to the back wall 4 thereof.

Prior to the present invention, it was common practise to use an elongated bushing in place of the bushing 8 here shown, and to locate the contact spring therein, but because of the unprotected position of the bushing and the easy entrance of water into its open forward end when so located, the undesirable destruction to tubes, previously noted, resulted.

In the present instance, the bushing 12 is of tubular form, closed at its mounting end, and provided at that end with lugs 13 for receiving supporting bolts 14 whereby it is attached to the housing wall 4. The forward ends of the bushings 12 are open and are alined with the bushings 8 to receive the tube ends thereinto.

Encircling the bushing 12 near its open end is a drainage groove 15, which prevents moisture, which may collect on and run down the wall 4 onto the bushing, from following along the bushing to the open end. The end of the bushing also is formed with a peripheral flange 16 to supplement the groove to prevent moisture passing to the open end.

The contact 10 disposed within the end of the bushing consists of a helically wound, metallic spring that is attached within the inner end of the bushing, to a bar 18 which in turn is fixed by a binding post 19 to the bushing. A circuit wire 20 leads to the post 19 for delivering illuminating current to the tube. With the tube so arranged and mounted, it is quite readily apparent that very little moisture will enter the housing through the bushing 8. It is further apparent that should any moisture follow along or collect on the tube within the mouth of the bushing 12, it will not cause short circuiting through the glass tube to the electrode for the reason that the latter is well outside of the bushing. Therefore, the puncturing of the tube, as in the previous forms of bushings, is avoided.

It is also apparent that by locating the supporting bushing 12 within the protected housing, instead of having its open end exposed to the weather through wall 3, there is little possibility of rain water, or moisture collecting within the bushing and thus causing short circuiting, or destruction of the terminal or electrode. Bushings of the present character have been found to be very satisfactory in use, and by their use in the manner disclosed, the replacing of damaged tubes has been reduced to a minimum.

The present invention is thought to reside, not only in the novel bushing, but also in the enclosing of this bushing in the supporting housing in a position protected from weather.

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

1. A bushing of the character described having means at one end for mounting it on a support, and having an open opposite end socket for receiving thereinto the terminal end of a luminous tube, a yieldable spring contact within the bushing adapted for making electrical connection with the tube terminal, a drainage groove encircling the bushing near its open end, a flange encircling the open end of the bushing and a binding post mounted in the bushing wall between the groove and flange and having connection at its inner end with the said contact and adapted for connection at its outer end in an electric circuit.

2. In combination, a sign support comprising a closed housing with front and back, spaced walls, a display tube mounted on the front wall and having end portions extended therethrough into the housing, bushings mounted about said tube ends where they pass through the front wall, other bushings mounted on the back wall within the housing to receive therein the terminal ends of said tube; said bushings having encircling drainage grooves near their ends and having encircling end flanges; said tube having electrodes contained in parts thereof disposed outside of the latter bushings, electrical contacts within the bushings for engaging the tube terminals.

HAROLD S. INGOLD.