Dec. 18, 1934. A. HANSEN 1,984,796

NEON ELECTRODE HOUSING

Filed March 30, 1931

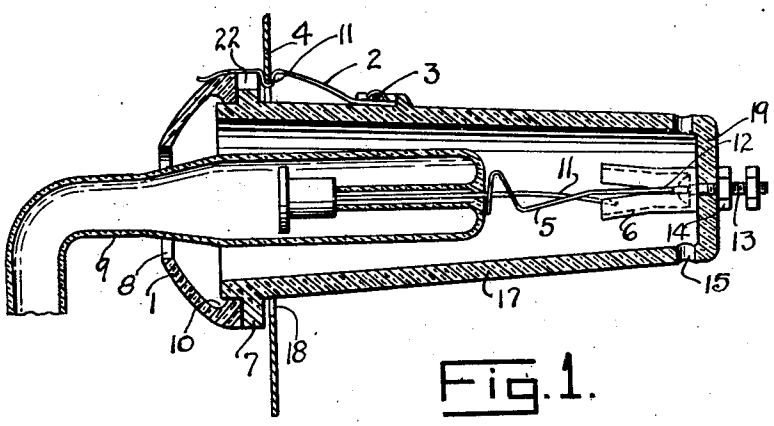



Fig. 1.

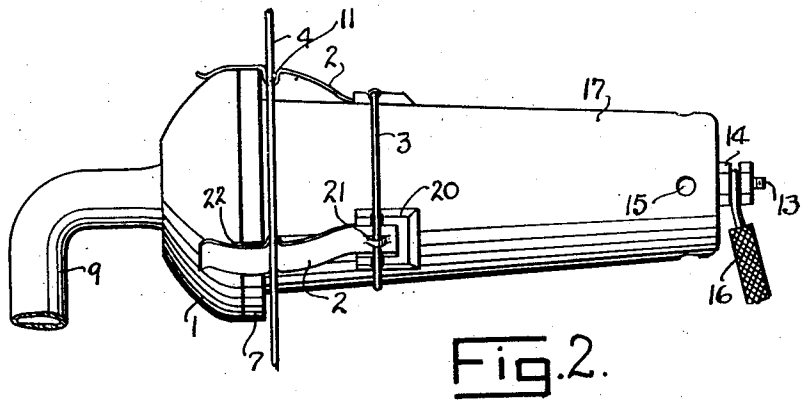



Fig. 2.

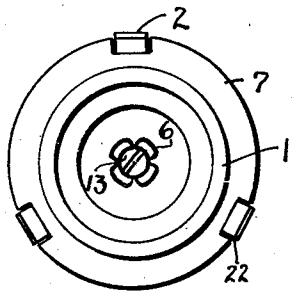



Fig. 3.

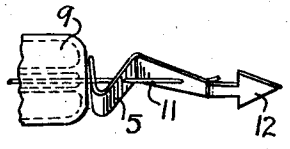



Fig. 4.

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# UNITED STATES PATENT OFFICE

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## NEON ELECTRODE HOUSING

Asger Hansen, Houston, Tex.

Application March 30, 1931, Serial No. 526,277

11 Claims. (Cl. 173—328)

My invention relates to neon electrode housings and has for its object the provision of a housing which may be inserted and attached to the body of the supporting board or plate from the forward side and to eliminate the necessity of access to the rearward side of the display board.

In the ordinary type of neon light housing the display board upon which the lights are attached is of sheet iron and openings are cut in this board into which the housing must be inserted. The housings previously formed must be inserted from the rearward side of the board and difficult methods of attachment have been employed which make it difficult and expensive to change the housings and insert new ones when desired. Also the older form of housing is impossible of change when a new light is to be inserted without cutting away some portion of the board or to some extent damaging the installation before a change can be made.

I desire to provide a housing which can be inserted from the forward side and automatically locked in place and which can be readily detached and changed.

I also desire to provide a housing to which access may be had from the forward side without difficulty and in which provision is made for the draining of liquid from the housing in case of rain finding entrance through the forward side thereof.

I also have as an object to provide a means for attaching the neon tube within the housing in a simple manner.

In the drawing herewith, Fig. 1 is a central longitudinal section through my housing shown as attached within an opening in the display board and with the neon tube in position.

Fig. 2 is a side elevation of the tube in place as shown in Fig. 1.

Fig. 3 is a front elevation of the housing with the cap and tube removed.

Fig. 4 is a broken detail showing the manner of attaching the tube to the electric terminal in the housing.

In the drawing I have shown the board 4 as being made of sheet iron, the main body of the board being broken away. Said board has a circular opening 18 therein through which the neon light housing may be projected. Ordinarily the housing is inserted through such an opening from the rearward side.

I have provided a housing 17, which is approximately frusto-conical in shape, the forward end being open to receive the tube, the walls of the tube converging toward the rearward end which is closed by the wall 19. Said housing has a radial flange 7 thereon adjacent the forward end, said flange limiting the inward movement of the housing when it is inserted within the opening 18.

The forward end of the housing is adapted to be partially closed by means of a cap 1, which is rounded and provided with an opening 8 centrally thereof through which the neon tube 9 may project. The inner end of the cap is provided with an inwardly curved flange which fits closely about the forward end of the housing and the base of the cap is adapted to abut against the flange 7 of the housing. An annular recess 10 is thus provided adjacent the inner end of the cap to receive moisture or water when rain is forced in around the tube to the cap. This moisture will flow over the edge of the cap and leak away without normally entering the housing 17. Should the water accumulate in the housing a series of leak openings 15 are provided at the inner end of the housing to allow the water to run out before it comes in contact with the neon tube 9.

The cap is held in position on the housing and the housing is held within an opening 18 in the board by means of springs 2. I employ a plurality of these springs and ordinarily three or four are desirable. These springs are flattened leaf springs, the inner ends of which are secured to the body of the housing by means of an annular wire 3. The outer face of the housing 17 may be provided with bosses or projections 20, grooved to receive the wire 3 and recessed centrally to receive the end of the spring 2. I contemplate extending the clamping wire 3 through a loop 21 in the end of the spring so as to more securely clamp the end of the spring in position. Said spring is curved outwardly and extends forwardly around the forward side of the cap 1. Between the ends of the curved portion of the spring is a loop or inwardly curved portion 11, which is adapted to contact and clamp against the walls of the opening 18 in the board 4.

The springs 2 are under tension outwardly so that when the housing is to be inserted within the opening the cap 1 is removed and the springs 2 are depressed so that the inner ends may pass through the openings 18 and in thus depressing the springs 2 slots or recesses 22 are provided in the flange 7 to allow the inward radial movement of the springs. When the housing is in position the springs 2 move outwardly and engage the loop 11 around the margin of the opening 18 in

the board. The cap 1 may then be placed in position by snapping it within the forward ends of the springs.

The inner end of the housing has a threaded bolt or pin 13 extending centrally therethrough. This bolt serves to engage within a clip which forms a terminal for the electric wire which is connected therewith. As will be seen from Fig. 1, this clip is a cup-shaped member slotted on the sides to provide a plurality of arms 6, between which the contact member on the neon tube may be inserted. The slots between the arms are wedge-shaped so that the contact member may be guided into position between the arms. At the outer end of the bolt 13 is a clamping nut 14 and an outer nut may be also screwed upon the bolt to engage the end of the conducting wire 16 thereto, as shown in Fig. 2.

The neon tube is of any preferred construction and forms no part of the present invention. There is projecting from the end of the tube a conducting wire 11 which ordinarily is maintained for engagement about the electric terminal in the tube. I have placed upon this wire 11 an automatically engaging member 5. This is preferably made of sheet copper or some other conducting metal. It is bent between its ends to form folds or loops therein, with openings extending through the folds, as shown particularly in Fig. 4, so that the wire 11 may be inserted through the registering openings in the body of the contact member when the folds are bent together. When the folds are released, however, the resiliency of the contact member will tend to throw the openings out of alignment and clamp against the conducting wire 11. The forward end of the conducting contact member is formed with an arrow-shaped head 12, which is adapted to be received between the clamping arms 6 of the clip.

In the use of the device thus shown it will be possible to connect the conducting wire 16 from the circuit with the forward bolt 13 on the housing, through the opening 18 in the board. The housing is then inserted in position and as the housing is inserted with the cap 10 removed the spring arms 2 will be automatically depressed until the housing is in position so that the spring arms will clamp against the margin of the opening 18.

The flange 7 will then be approximately in position against the wall of the board. The cap may then be placed in position and the housing is ready to receive the neon tube 9. With said tube equipped with my automatically engaging contact member, the end of the tube may be inserted axially into the housing and the forward end 12 thereon will be received between the arms 6 of the clip and will make a tight frictional engagement therewith which can not be accidently disengaged, but which is sufficient to support the tube in proper position at its inner end.

It will be seen that housings of this character can be very quickly inserted in position without difficulty and without having to get behind the board 4 to secure it in position and that the neon tube may be easily and quickly inserted into position without difficulty. Furthermore, the manner in which the cap 1 is formed allows the draining of water, due to rain or otherwise, from the housing around the inner rims thereof without danger of submerging the walls of the tube 9 in the housing. The device is simple and cheap to manufacture and will save the operator a material amount of time and labor.

What I claim as new is:

1. The combination of a supporting plate having openings therein, a neon light housing shaped to extend through one of said openings from the forward side thereof, a flange on said housing to engage the forward side of said plate, latching means on said housing comprising spring arms adapted to be forced outwardly and to automatically engage the margin of said opening and secure said housing in said opening, and a closure cap for the outer end of said housing, adapted to engage and be held in position by said latching means.

2. The combination of a supporting plate having openings therein, a neon light housing shaped to extend through one of said openings from the forward side thereof, a flange on said housing to engage the forward side of said plate, latching means on said housing comprising spring arms adapted to be forced outwardly and to automatically engage the margin of said opening and secure said housing in said opening, and a closure cap for the outer end of said housing, adapted to engage and be held in position by said latching means, said cap having an opening therein to receive a light tube, and means in said housing to automatically connect the said tube when said tube is inserted therein.

3. In a neon light sign, a supporting plate thereon, having openings therein, a housing of insulating material tapered inwardly and adapted to be inserted from the forward side of said plate into one of said openings, latching means on said housing to automatically engage in said opening and secure said housing therein, and forward extensions on said latching means, accessible from said forward side to release said latching means when desired.

4. In a neon light sign, a supporting plate thereon having openings therein, a housing of insulating material tapered inwardly and adapted to be inserted from the forward side of said plate into one of said openings, spring arms projecting forwardly beyond the end of said housing and having notches therein, to automatically engage in said opening and secure said housing therein, an electric circuit terminal extending through the smaller end of said housing, and clamping arms in said housing connected with said terminal adapted to frictionally engage a light tube terminal when said tube is inserted in said housing.

5. A light tube housing adapted to be inserted through an opening in a supporting plate, spring arms on the outer surface of said housing to automatically engage the margin of said opening and support said housing in position, an electric circuit terminal in said housing, a cap adapted to engage over the outer end of said housing and be held in position by said arms, said cap having a central opening and an inner annular groove to receive liquid therein and allow said liquid to drain over the margin of said cap.

6. In combination a neon light housing adapted to be inserted through an opening in a sign board, means on said housing to engage the margin of said opening and to latch said housing in position against movement in either direction and adapted to be unlatched from the outer end thereof, and a cap for said housing held in position by said means.

7. The combination of an electric tube housing of insulating material, an electric conductor extending through the inner end thereof, friction

arms in said housing on said conductor, a light tube, a conducting wire projecting therefrom, a strip of conducting material bent to form loops perforated to receive said wire and engage frictionally thereon, and a flat contact member on the forward end of said strip to wedge between said friction arms.

8. A light tube housing adapted to be inserted through an opening in a supporting plate, spring arms on the outer surface of said housing having depressions therein to automatically engage the margin of said opening and support said housing in position, and a cap member to fit about the forward end of said housing and engage on the inner side of said arms and hold them in plate engaging position.

9. A light tube housing adapted to be inserted through an opening in a supporting plate, spring arms on the outer surface of said housing to automatically engage the margin of said opening and support said housing in position, a cap to fit about the forward end of said housing, and forward inwardly curved projections on said spring arms to engage about said cap and support said cap in position on said housing to close the forward end thereof, said cap having a central opening to allow the full entrance of a light.

10. In a neon light sign a supporting plate having openings therein, an inwardly tapered housing adapted to be inserted from the outside of said plate through one of said openings, a radial flange on the forward end of said housing, spring arms on said housing extending forwardly beyond said flange and having inwardly curved ends, and a cap fitting over the outer end of said housing and beneath said spring arms, said spring arms engaging said plate and said cap to secure said housing in said opening, and to secure said housing on said plate.

11. In a neon light sign, a plate having an opening therein, a housing adapted to be inserted into said opening, means to limit the inward-movement of said housing into said opening, spring arms on said housing extending longitudinally of said housing and having depressions therein to engage the margin of said plate and latch said housing in position, and a cap on said housing engaging said arms to retain said arms in latching position.

ASGER HANSEN.