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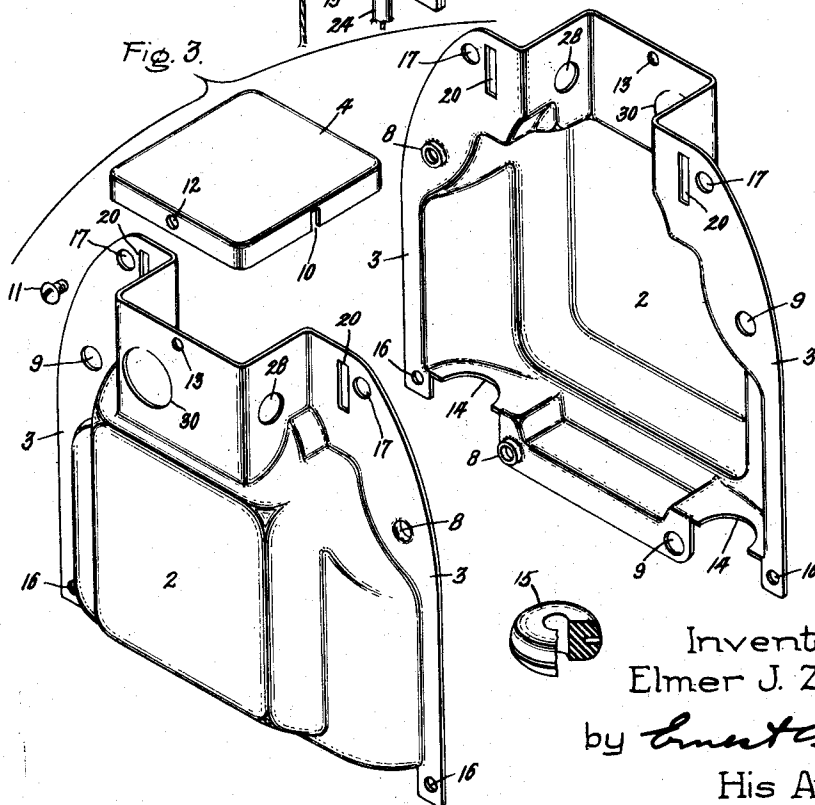
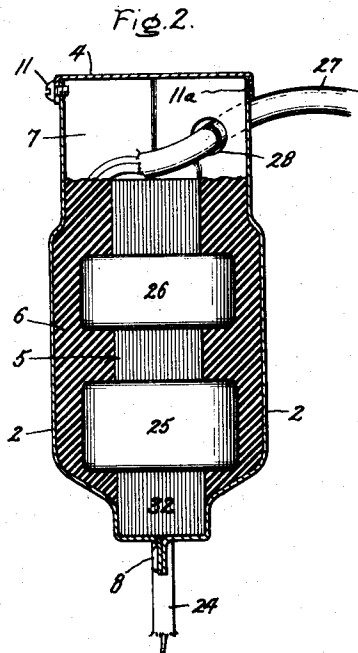
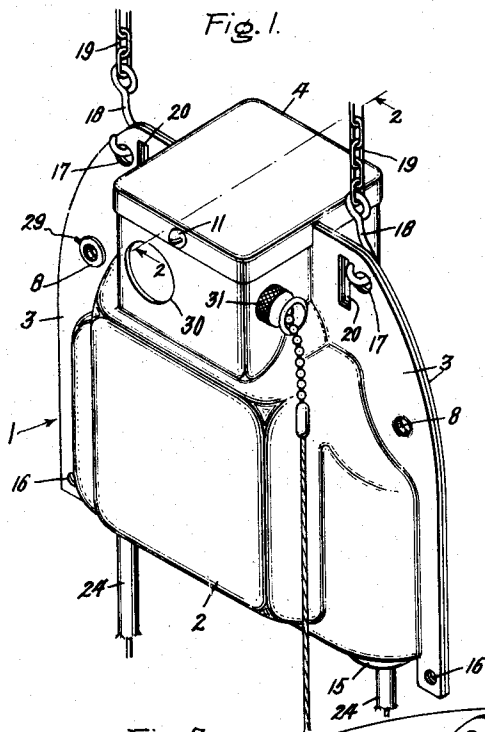
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TWO-PART CASING FOR ELECTRIC APPARATUS

Filed July 24, 1948

2 Sheets-Sheet 1



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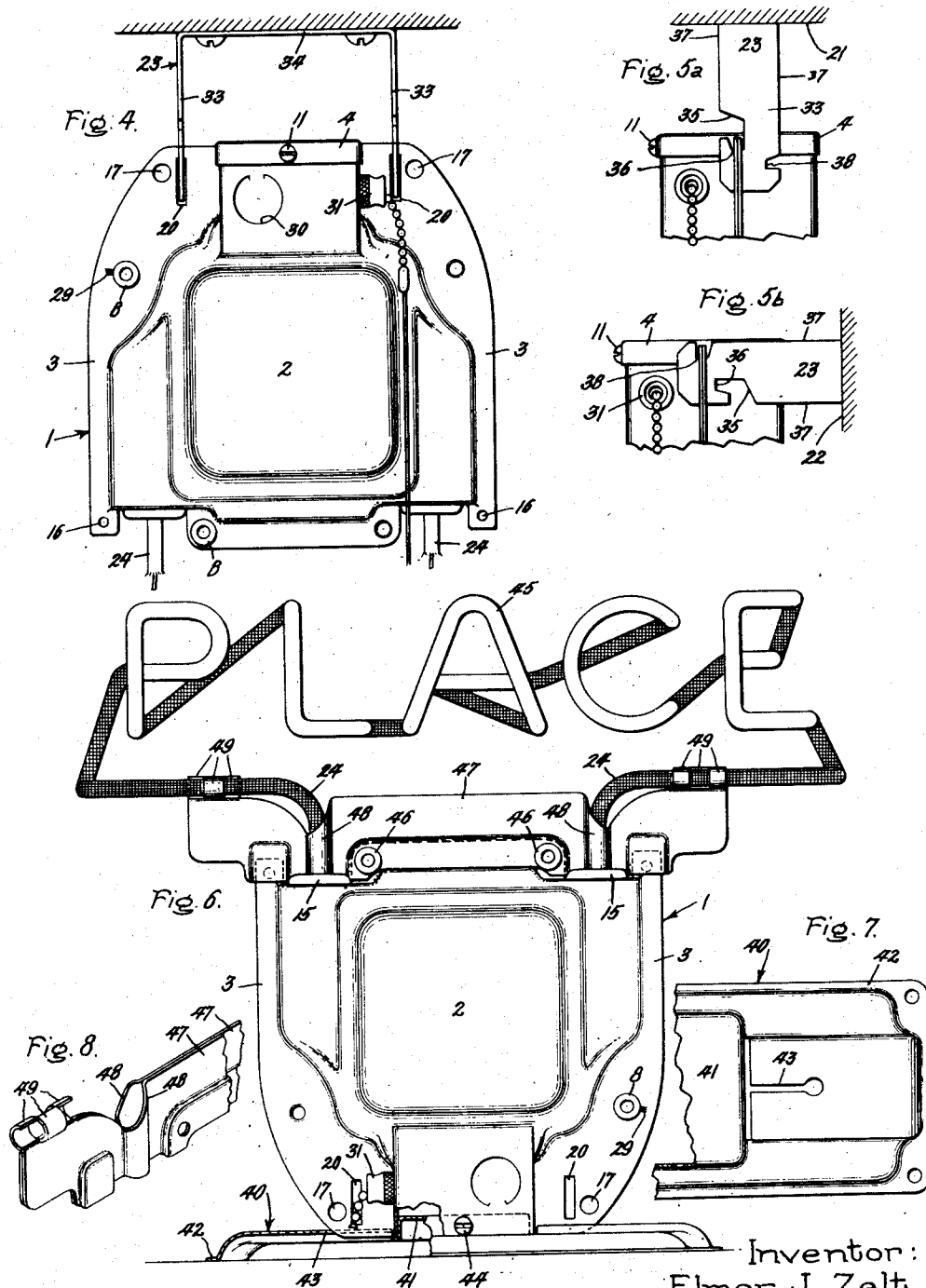
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TWO-PART CASING FOR ELECTRIC APPARATUS

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UNITED STATES PATENT OFFICE

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TWO-PART CASING FOR ELECTRIC APPARATUS

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2 Claims. (Cl. 174—52)

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This invention relates to electric apparatus and more particularly to supporting or suspending arrangements and enclosing housings for such apparatus. It has particular application to luminous tube transformer ballasts although not limited thereto.

A luminous tube or similar electron discharge device possesses the characteristic of negative resistance after ionization of the gases within the tube has occurred and conduction through the ionized gases has begun. Thus it is necessary to provide some sort of current limiting means. This may be done by inserting a resistor in the series with the luminous tube load. But resistance ballasting has the disadvantage of causing an excessive power loss in the circuit, and a preferred means is to insert a series reactance in the circuit and thereby limit the load current without any appreciable power loss. It is often necessary also in the operation of certain gaseous discharge devices such as luminous tubes to provide a lamp voltage of greater magnitude than that of the supply. Thus a transformer may be utilized to achieve this voltage increase. A transformer having high leakage reactance may be inserted into the luminous tube circuit and accomplish the dual purpose of current limiting by high reactive impedance and voltage increase for proper lamp operation. To such a device is given the name "Transformer ballast." Since such transformer ballasts are employed for a variety of purposes, it is desirable that they be compact, of simple construction, easily mounted in various positions, of low cost, attractive, and have easily accessible parts.

It is therefore an object of this invention to provide a transformer ballast of the type described having an improved structure or housing which permits it to be of more compact size.

It is another object of this invention to provide such a housing structure which is both simple and economical to fabricate and assemble.

A further object of this invention is to provide simple and economical means for easily mounting such a ballast and for attaching a luminous tube sign thereto.

Still another object of this invention is to provide a housing for electric apparatus of the type described having an improved junction box construction permitting increased accessibility of electrical leads.

The invention will be better understood from the following description taken in connection with the accompanying drawings and its scope will be pointed out in the appended claims.

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In the drawings, Fig. 1 is a perspective view of a particular embodiment of this invention; Fig. 2 is a cross sectional view taken through the section 2—2 of Fig. 1; Fig. 3 is an exploded perspective view of a particular embodiment of this invention showing only the housing structure; Fig. 4 is a front elevation of a particular embodiment of this invention showing the electric apparatus suspended from overhead; Figs. 5a and 5b are side elevations of a portion of the particular embodiment of this invention illustrated in the previous figures showing means for mounting the electrical apparatus by use of a single hanger bracket from either overhead or the side; Fig. 6 is a front elevation illustrating means for mounting the particular embodiment of this invention previously illustrated, on a pedestal or base, and also illustrating means for supporting a luminous tube above the illustrated embodiment of this invention; Fig. 7 is an enlarged plan view of a portion of the pedestal or base shown in Fig. 6; Fig. 8 is an enlarged perspective view of a portion of the means shown in Fig. 6 for supporting a luminous tube sign.

In this particular application of the invention, a supporting arrangement and enclosing housing for a luminous tube transformer ballast is provided in an economical and simple construction by forming the housing structure in two identical halves which are generally shell-shaped and have flanged edges so that the volume enclosed by the contiguous shell halves will have substantially the shape of the transformer ballast and will provide an additional space to serve as a junction box.

Referring now to the drawings, there is shown therein in Fig. 1 a luminous tube transformer housing 1 and supporting arrangement which is constructed, as can be seen more clearly in Fig. 3, of three main members; two identical partially hollow shell-shaped halves 2 having extending flanged edges 3 which serve as cooling fins and a cap 4 which seals the casing structure. The casing halves 2 are placed in contiguous relationship and the volume enclosed by them is formed substantially in the shape of the enclosed electric apparatus 5, as can be seen in Fig. 2. The size of the enclosed transformer ballast 5 is such that after the ballast 5 has been positioned within the housing structure and insulating compound 6 added, there is a volume remaining which serves as a junction box 7. Integral rivets 8 formed in the flanged edges 3 of the casing halves 2 cooperate with corresponding eyelets 9 and, in securing the halves 2 together, are peened in position. The junction box cover 4 has grooves 10 which

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accommodate the flanged edges 3 of the housing halves 2. The cover 4 is secured to the halves 2 by a single screw 11 which fits through the openings 12 and 13 in the junction box cover 4 and the housing halves 2, respectively. Since only one screw 11 is necessary, a dimple or indentation 11a may be pressed in the cover 4 so as to engage one of the holes 13. It can be seen that the fabrication of this casing structure is very simple, requiring only two stampings since both halves 2 are identical and that, in addition to the integrally formed rivets 8, only one screw 11 is used in the unit assembly.

Semicircular openings 14 are provided in the base of each of the casing halves 2 to accommodate the high voltage bushings 15. Holes 16 are provided at the base of the transformer casing halves 2 to allow a luminous tube or a luminous tube sign to be suspended therefrom by means of wires or cables; circular openings 17 are also provided at the junction box 7 end of the casing structure 1 to permit the housing halves 2 and their enclosed electric apparatus 5 to be suspended from an overhead by means of hooks 18 and cooperating chains or cables 19, as shown in Fig. 1. In addition, rectangular slots 20 are also provided which allow the casing structure 1 to be suspended from an overhead surface 21 or from a vertical wall 22 in cooperation with a hanger type bracket 23, illustrated in Figs. 5a and 5b.

In assembling the casing 1, the high voltage leads 24 of the transformer ballast 5 are anchored to the high voltage coils 25. The transformer ballast 5 is then placed within one side or one half of the casing structure 1, connections are made to the primary coils 26, the primary supply lead 27 passes through an opening 28 in the casing 1, as shown in Fig. 2, a ground lead 29 from the transformer is placed in one of the eyelets, as can be seen in Fig. 1, thus grounding the transformer 5 to the casing structure 1; insulating bushings 15 having grooves which cooperate with the semicircular openings 14 in each of the housing halves 2 are slipped over the high voltage leads 24, and the remaining half of the casing 1 is put in place. To maintain the contiguous relationship of the casing halves 2, the integral rivets 8 are eyeleted or peened over the outer edges of their cooperating holes 9. Insulating compound 6 is then poured in through the top of the casing structure 1 until it is level with the top of the transformer ballast 5. The remaining volume serves as a junction box 7 for cables which may be brought into the transformer 5 through the openings 30 which are originally sealed but may easily be pushed open, and for the primary switch 31 which passes through an opening 28 which corresponds to the opening 28 through which the primary lead 27 passes. As can be seen in Fig. 2, the transformer ballast core 32 is held securely between the casing halves as are the two high voltage insulating bushings 15.

A hanger bracket 23 formed of a narrow strip of metal having a substantially channel shape presenting two parallel sides 33 of equal length and a main body 34 has punched or similarly formed grooves in the parallel sides 33 which cooperate with the rectangular openings 20 in the casing halves 2 and permit the housing arrangement 1 to be mounted from either an overhead surface 21 or vertical wall 22. One set of grooves 35, as illustrated in Fig. 5a, is so formed that the edge 36 which supports the housing unit 1 is formed perpendicular to the edges 37 of the hanger bracket 23, whereas as illustrated

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in Fig. 5b, when supporting the housing 1 from a vertical wall 22, the supporting edge 38 of a second groove 39 formed in the hanger 23 is parallel to the edges 37.

In Figs. 6 and 7, there is illustrated means for supporting the housing assembly 1 in a vertical position on a flat surface, such as a show case or table. A substantially flat mounting plate 40 which may be constructed of sheet metal and has a relatively large surface area as compared to the size of the housing assembly 1, is formed with an indentation or depression 41 which has an exterior outline substantially similar to the interior outline of the junction box 7. The edges 42 of the mounting plate 41 may be turned over, as shown in Fig. 6, so as to provide a more substantial supporting base. The flanged edges 3 of the housing assembly 1 fit in cooperating grooves 43 in the mounting plate 40. In order to utilize the horizontal mounting plate 40, the cover or cap 4 may be removed and the indented portion 41 of the plate 40 may be inserted within the junction box 7. Screws 44 are passed through the holes 13 present in the housing halves 2 and through the indented portion 41 of the mounting plate 40 to secure the mounting plate 40 to the housing assembly 1.

Also shown in Fig. 6, and in greater detail in Fig. 8, is means for supporting a luminous tube sign 45 from the vertical mounted housing assembly 1 described previously. Mounted by any suitable means such as bolts or rivets 46 above the high tension bushings 15 are two identically formed strips or stampings 47 which are provided with semi-circular grooves 48 and semi-circular prongs 49. The high voltage leads 24 are passed through the cylinders formed by the grooves 48 of the two metal stampings 47 which are in contiguity and are also passed through the cylindrical volumes formed by the prongs 49. In this way the luminous tube 45 is supported above the housing assembly 1.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the invention, and therefore it is aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. Encasing means for electric apparatus having an elongated rectangular cross-sectioned magnetic core which is provided with a plurality of windings to which are attached respectively low tension and high tension leads comprising, in combination, duplicate stamped sheet metal casing halves each having a discontinuous peripheral flange surrounding a generally cup shaped central portion, said casing halves being arranged with their flanges in contact and with their central portions extending away from each other to form a hollow casing, said flanges having a plurality of registering perforations, fastening means extending through certain of said perforations, certain other of said perforations being spaced parallel mounting slots, integral shoulders in the sides of said casing halves defining aligned receptacles for holding respectively the opposite ends of said core, semi-circular openings in one edge of each casing member on opposite sides of one of said core end receptacles where said flanges are discontinuous, said semi-circular openings of said casing halves being in

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complementary relation to form two circular openings in said casing, circular insulating bushings for said high tension leads, said bushings each having a circular outer groove, said bushings being mounted in said circular openings in said casing with their outer grooves embracing the sides of said circular openings for retaining said bushings in place, a semi-rectangular extension in one edge of each casing half beyond the other core end receptacle where said flanges are discontinuous, said semi-rectangular extensions together forming a rectangular cross-section junction box for said low tension leads, at least one circular knockout member in a side of each of said extensions, a flanged rectangular cover for said junction box, and two oppositely disposed notches in the cover flange for receiving the flanges of said casing halves and acting as additional means for holding said casing halves together.

2. Encasing means for electric apparatus having an elongated rectangular cross-sectioned magnetic core which is provided with a plurality of windings to which are attached respectively low tension and high tension leads comprising, in combination, duplicate stamped sheet metal casing halves each having a discontinuous peripheral flange surrounding a generally cup shaped central portion, said casing halves being arranged with their flanges in contact and with their central portions extending away from each other to form a hollow casing, said flanges having a plurality of registering perforations, fastening means extending through certain of said perforations, certain other of said perforations being spaced parallel mounting slots, integral shoulders in the sides of said casing halves defining aligned receptacles for holding respectively the opposite ends of said core, semi-circular openings in one edge of each casing member on opposite sides of one of said core and receptacles where said flanges are discontinuous, said semi-

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circular openings in said casing halves being in complementary relation to form two circular openings in said casing, circular insulating bushings for said high tension leads, said bushings each having a circular outer groove, said bushings being mounted in said circular openings in said casing with their outer grooves embracing the sides of said circular openings for retaining said bushings in place, a semi-rectangular extension in one edge of each casing half beyond the other core and receptacle where said flanges are discontinuous, said semi-rectangular extensions together forming a rectangular cross-section junction box for said low tension leads, at least one circular knockout member in a side of each of said extensions, a base of stamped sheet metal having a central integral raised rectangular portion which fits tightly into the end of said rectangular cross-section junction box, and aligned slots in said base on opposite sides of said raised portion into which fit the flanges of said encasing means.

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