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P. J. ZERWES

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TERMINAL STRIP

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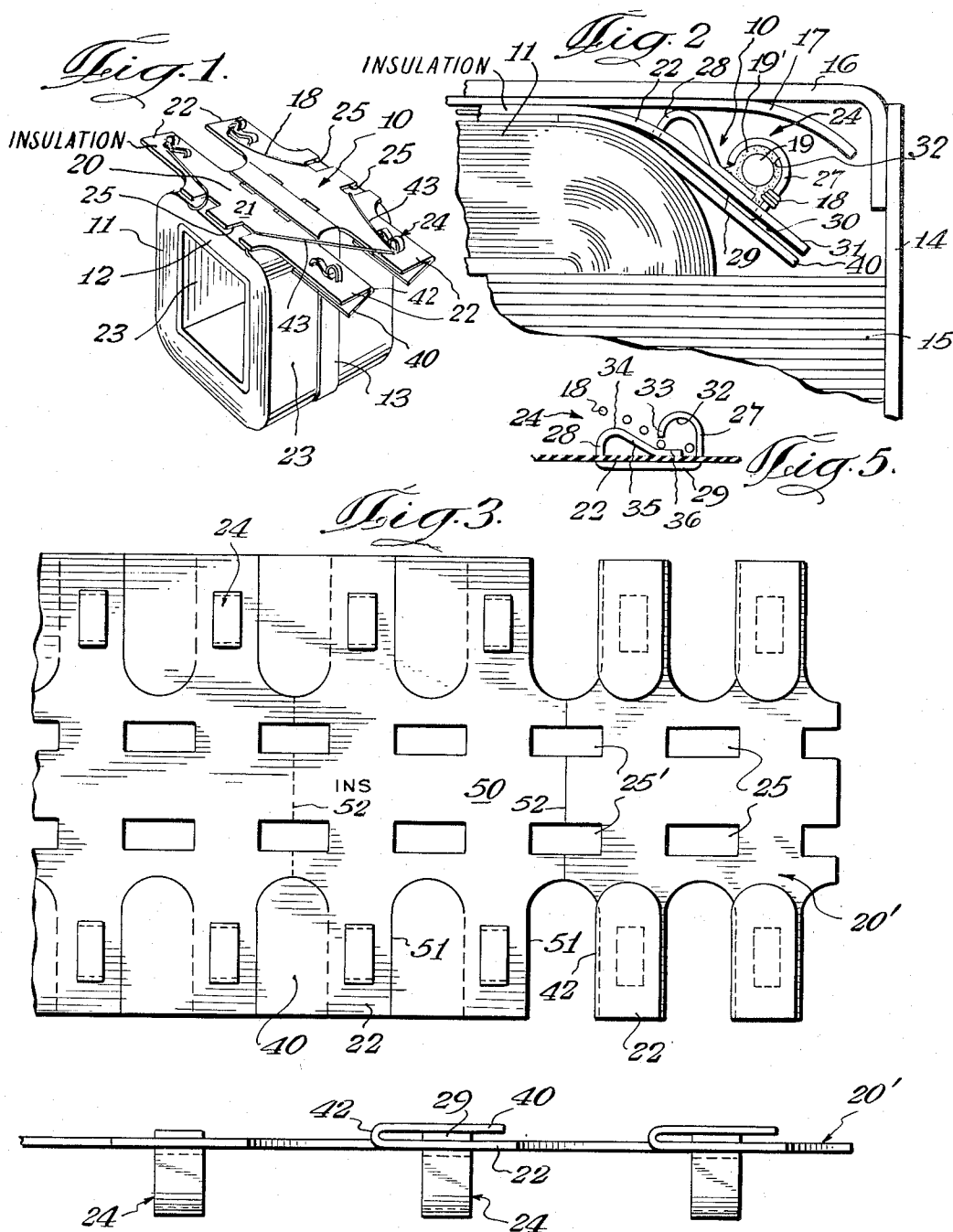


Fig. 4.

Inventor
Paul J. Zerwes
By J. Irving Silverman
Attorney

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TERMINAL STRIP

Paul J. Zerwes, Chicago, Ill., assignor to Advance Transformer Co., Chicago, Ill., a corporation of Illinois

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This invention relates generally to electrical connectors and more particularly is concerned with an electrical connector for connecting a fine wire to a coarser wire. The electrical connector embodying the invention is in the nature of a terminal strip unit for use with ballasts of the type commonly inserted in a circuit for igniting and operating gaseous discharge devices such as fluorescent lamps.

The windings of a coil in a transformer used to operate fluorescent lamps consist of wire of fine gauge and it is necessary to connect the fine wire leads from such coils to a coarser wire which leads to the lamps proper. Heretofore, to effect such a connection, a terminal strip unit consisting of terminal strip paper and a terminal member was mounted on the coil and the fine wire leads from the coil and the coarser wire electrically joined by means of the terminal member. It is desirable that the terminal strip unit of this character be so constructed as to permit the fine wire leads easily and rapidly to be secured thereto and to insure proper insulation of the terminal member from inadvertent contact with the coil thereby short circuiting the ballast coil. In addition, it is advantageous to have a terminal strip which may be formed with a minimum of labor and waste so as to maintain the cost thereof at a minimum. It is therefore the primary object of this invention to provide a terminal strip unit of the character described which will produce the desirable results above enumerated and believed not to be attributable to prior art constructions.

A principal object of the invention is to provide a terminal strip unit of the character described having a pre-formed terminal strip member adapted to be formed from a continuous sheet of terminal strip paper, said continuous sheet being stamped out to provide the proper shape and form for the terminal strip member.

Another object of the invention is to provide a terminal strip member in a terminal strip unit of the character described having novel means for completely insulating the terminal member from the ballast coil.

The coils ordinarily used in ballasts of this type are wound in elongate sections on spindles and then cut to size for use in the particular ballast. The coils may be long or short as the need requires. The terminal strip unit embodying the invention permits the continuous sheet of terminal strip paper, after it is stamped out and with the terminal members properly mounted thereon to be secured on such an elongate section of coil. As an important object of the invention I provide gauging means which serve to indicate at which point the terminal strip sheet and coil are to be cut to provide a coil of particular size; which indicate the point on the terminal strip sheet to be cut for providing a pre-determined number of terminal members on a coil; and which serve to direct the rapid and sure connection of the proper fine wire leads to the proper terminal member.

Another principal object of the invention is to provide a terminal member in a terminal strip unit of the character described having a pre-formed unobstructed throat into which the fine wire to be secured to said member may be

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passed to the point on said member where same is to be secured thereby insuring speedy and uninterrupted installation.

Other objects of the invention are to provide a terminal strip unit of the character described which is characterized by its simple and economical construction and its durability.

These and other objects will become apparent as the description of the invention proceeds, in connection with which a preferred embodiment thereof has been shown in the accompanying drawing. The invention will be seen to reside in the combination and construction of parts hereinafter more fully described, shown in the drawings and defined in the appended claims, it being understood that minor variations in the combination and construction of parts may be had without departing from the spirit or scope of the invention as set forth in the claims.

In the drawings:

Fig. 1 is a perspective view of a terminal strip unit constructed in accordance with the invention, same being shown mounted on a ballast coil.

Fig. 2 is a side elevational view of the said terminal strip unit and showing same mounted on a coil disposed in a ballast, shown partially in section.

Fig. 3 is a plan view of a part of a continuous member embodying the invention and showing how terminal supporting members may be cut therefrom.

Fig. 4 is a side elevational view of the invention shown in Fig. 3.

Fig. 5 is a side elevational view of the terminal member and showing the manner in which the fine wire leads from the ballast coil may be secured thereto.

Generally, the terminal strip unit embodying the invention consists of two principal parts cooperating to affect the desirable advantages enumerated hereinabove. There is a terminal strip member which is pre-formed from a continuous sheet of terminal strip paper of the type commonly used in devices of this kind. The said terminal strip member is stamped out from such a continuous sheet of terminal strip paper to proper form and shape for having secured thereon terminal members to which electrical leads are to be connected. The terminal member has a portion extending from one surface of the terminal strip member, which portion receives the electrical leads, and there is a second portion exposed on the opposite surface of the strip member holding same on the said strip member. The first mentioned portion is provided with an unobstructed throat along which the fine wire leads from the transformer coil may be passed to a point on said portion where it is secured. There is provided on the terminal strip member novel means formed during the stamping out operation which completely insulates said second mentioned portion from inadvertent contact with the transformer laminations or metal parts. Also, the terminal strip member is provided with gauge means heretofore mentioned.

Referring now to the drawings, the terminal strip unit embodying the invention is designated generally by the reference character 10. Same is adapted to be mounted on a coil 11 such as shown in Fig. 1, the coil 11 being of the type commonly used in transformers adapted to ignite and operate fluorescent lamps. The unit 10 is secured on a wall 12 of the said coil and may be maintained in position thereon by means of an adhesive tape 13 passing around the coil and over the unit 10 in a well-known manner. As shown in Fig. 2, the coil 11 is adapted to be received in a casing 14 in association with a stack of laminations 15, the unit 10 being disposed adjacent the open end of the casing. A cover plate 16 is provided for closing the open end of the casing and a strip 17 of insulating material is sandwiched between the unit 10 and said cover plate. Except for the terminal

strip unit 10 embodying the invention, the construction above described is well known.

The coil 11 ordinarily is wound from wire of relatively fine gauge, the leads from the coil being shown at 18. It is intended that such leads 18 be electrically connected to wire 19 such as shown in Fig. 2 which is coarser and of a heavier gauge. The connection is effected by means of my terminal strip unit hereinafter described.

Referring to Fig. 1, the terminal strip member 20 is shown secured to the coil 11. Said member is made from terminal strip paper having the necessary insulating properties. Said member 20 has a body portion 21 which is adapted to be fitted over the top wall 12 of the coil 11. Integrally formed on each of the side edges of the portion 21 is a pair of spaced fingers or extensions 22 which protrude beyond the coil 11 on opposite sides 23 thereof. The fingers 22 each are flat, planar members and are adapted to support a terminal member designated generally 24. The opposite edges of portion 21 each are provided with a pair of cut-out portions 25 which terminate just short of the front and rear faces respectively of the coil 11.

The terminal member 24 is a staple-like member which is mounted on a finger 22. Same is made from a conducting material such as metal and includes a leg 27 and a leg 28 both passing through the finger 22 and a bight portion 29 connecting said legs and engaging against the bottom surface 30 of finger 22 to hold the member 24 on said finger. The leg 27 protrudes beyond the upper surface 31 of finger 22 and is curved to form a socket 32 above surface 31 in which the lead 19 is adapted to be retained. The end 33 terminates short of the surface 31.

The leg 28 is curved as at 34 to provide a straight portion 35 which extends back toward leg 27 and is inclined downwardly relative to finger 22. The end 36 is bent to extend parallel to surface 31 and engages therewith locking member 24 on finger 22. The end 36 terminates just short of leg 27. It will be noted that end 36 is disposed below the end 33 and is spaced therefrom. There is thus formed an unobstructed throat in said member 24 for facilitating mounting of the fine wire 18. The manner in which this is accomplished is shown in Fig. 5. The progressive positions of wire 18 are shown as it is led down the inclined portion, through the space between end 33 and 36, and along end 36 to where it is wound around leg 27. The wire 19 may then be inserted in socket 32 in contact with lead 18. Under conditions of mass production, this construction permits the lead 18 which is made of fine wire to be rapidly slapped down the incline 35, and secured to the leg 27 in almost one continuous motion. There are no protrusions or obstructions upon which the wire 18 possibly could snag or be snapped. On the production line, this permits rapid and easy assembly. Soldering 19' is accomplished after insertion of wire 19.

Referring to Fig. 2, it will be seen that the portion 29 engaged against the bottom surface 30 could rub against the coil 11 if the finger 22 were bent downwardly too far in the assembly of the transformer. Heretofore, such a condition has resulted in the short circuiting of the transformer. To prevent such inadvertent contact of the member 24 with the coil 11, I provide means integrally formed on each finger 22 which positively prevents such an occurrence. Such means consists of a flap 40 integrally formed on one edge of said finger along the fold 42. The flap 40 is substantially equal in length and width with that of the finger 22 and when bent back will completely cover the portion 29 and prevent inadvertent contact thereof with the coil 11.

Referring now to Fig. 3, I have shown a continuous sheet 50 of terminal strip paper from which the strip member 20 may be formed. The width of sheet 50 is equal to that of strip member 20 shown in Fig. 1. The strip 50 is adapted to be passed through a stamping ma-

chine where cut-out portions 25, fingers 22 and flaps 40 are stamped out in one continuous operation. The flaps are obtained by cutting sheet 50 along the edge 51, but leaving fold line 42 along which the said flap is integrally joined to a finger 22. The sheet 50 may be marked or scored along lines 52 which indicate where the sheet 50 may be cut to separate therefrom a terminal strip member 20 of a particular size. It will be noted that the sheet 50 is stamped out to provide completed members 20 ready for mounting on a ballast coil.

The cut-out portions 25 serve as gauging means by means of which certain advantages are effected. As shown in Fig. 3, the cut-outs 25 are stamped out at regular intervals along the body portion of sheet 50 and that the line 52 lies approximately midway between the ends of the alternate cut-outs 25'. Where the ballast coils are wound on elongate spindles, the sheet 50 already stamped out and with the terminals 24 mounted on fingers 22, may be placed on such a coil and taped thereon by means of tapes 13. Presume that it is desired to have a ballast coil of a certain length. This may be done by cutting the coil with the sheet 50 mounted directly and a complete assembly of ballast coil and terminal strip unit is obtained directly. Another advantage is that elongate coil and strip unit may be shipped in assembled condition with the instructions as to where cutting should be done to provide a given number of fingers 22. The third end served is that the cut-outs 25 as shown in Fig. 1 direct connection of proper leads to proper terminals. Thus, if it is desired to connect fine wires 43, 43 to terminal 24, each said lead may be disposed in a proper cut-out 25 as shown in Fig. 1 and lead to said terminal. It thus will be seen that cut-outs 25 aid substantially in proper connection of leads 43, 43 to a desired terminal such as 24, and in gauging the size of terminal strip member 20 desired for a particular coil and in indicating where sheet 50 is to be cut to have a member 20 with a desired number of terminal members.

It is believed that the invention has been described so as to enable the artisan skilled in the art to which same appertains to understand and practise the same. While I have shown and described a particular embodiment of the invention, it will be apparent that minor modifications and variations thereof may be made without departing from the spirit of the invention. It is desired that the appended claims be interpreted to include within the scope of my invention, all such modifications and variations in the combination and construction of parts by which the objects of the invention may be attained by the use of the same or equivalent means.

I claim:

1. A terminal strip unit adapted to be cut in a severing step from a continuously formed strip of flexible insulating material, said strip having an elongate body portion formed with a plurality of lateral extensions spaced along each side edge thereof, the extensions along one side edge being respectively aligned with extensions along the opposite side edge, and a flap member integrally formed along one edge of each extension, and parallel rows of cut-outs along the body portion, the cut-outs being spaced apart at intervals along the length of the strip with each cut-out of one row being aligned laterally with a cut-out of the other row and each pair of laterally aligned cut-outs being positioned between adjacent extensions, a terminal member secured on the upper surface of each extension with exposed portions thereof on the bottom surface of the extension, the flap member folded along said one edge to a position overlying the said bottom surface of the respective extensions and covering the exposed portions, said strip adapted to be selectively severed along a line passing through the laterally aligned cut-outs transversely of the body portion for obtaining a terminal strip unit having a predetermined number of lateral extensions.

2. A unit as described in claim 1 in which each ter-

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terminal member is arranged transverse to the length of the body portion, has a socket on said upper surface formed at one end of the terminal member, and an unobstructed conductor guideway leading from the opposite end of the terminal member to the entrance to said socket.

3. A terminal strip unit comprising a flexible sheet member of insulating material having a plurality of integral spaced apart lateral extensions along opposite side edges thereof, the extensions on one side edge being aligned with the extensions on the other side edge, 10 a metallic terminal secured to each extension on one face thereof for connection of conductors thereto and having a secured portion exposed on the second face thereof, and parallel flap members integral with said sheet member, formed of those portions of material between adjacent extensions and each connected to an extension along one edge thereof and folded upon the second face of said extension insulatedly covering the exposed portion of the terminal secured thereto.

4. A unit as claimed in claim 3 in which said flaps are 20 substantially of the same size as the extensions.

5. A unit as claimed in claim 3 in which the opposite end edges are provided with conductor guide slots.

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6. A unit as claimed in claim 3 in which each terminal comprises a formed two-branch staple-like member pierced through an extension from said second face thereof whereby the bight comprises said above referred to exposed portion and having one branch clinched on the one face of said extension and the other branch bent upon itself to provide a conductor-receiving socket formation.

References Cited in the file of this patent

UNITED STATES PATENTS

1,122,290	Mack	Dec. 29, 1914
1,952,554	Lavarack	Mar. 27, 1934
2,072,635	Helgason et al.	Mar. 2, 1937
2,159,269	Hasse	May 23, 1939
2,265,846	Krantz	Dec. 9, 1941
2,413,897	Wilson	Jan. 7, 1947
2,471,869	Gebel	May 31, 1949
2,529,653	Epstein	Nov. 14, 1950
2,553,287	Yates	May 15, 1951
2,580,269	Alvarez	Dec. 25, 1951
2,627,584	Schultz	Feb. 3, 1953
2,633,481	Meeks	Mar. 31, 1953