

Sept. 1, 1936.

C. DE LANGE

2,052,700

TERMINAL CONSTRUCTION

Filed Feb. 4, 1932

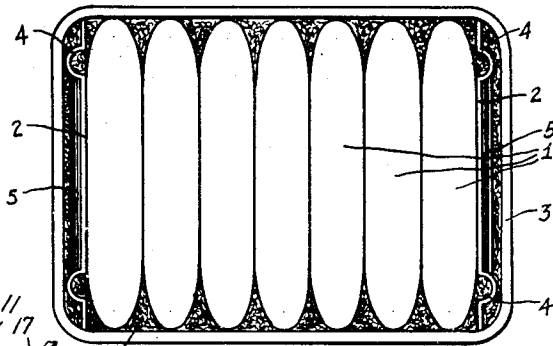


Fig. 1

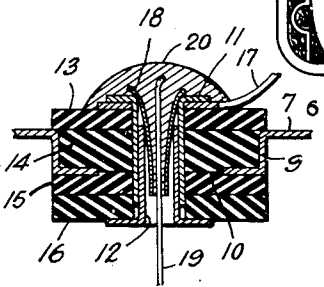


Fig. 3

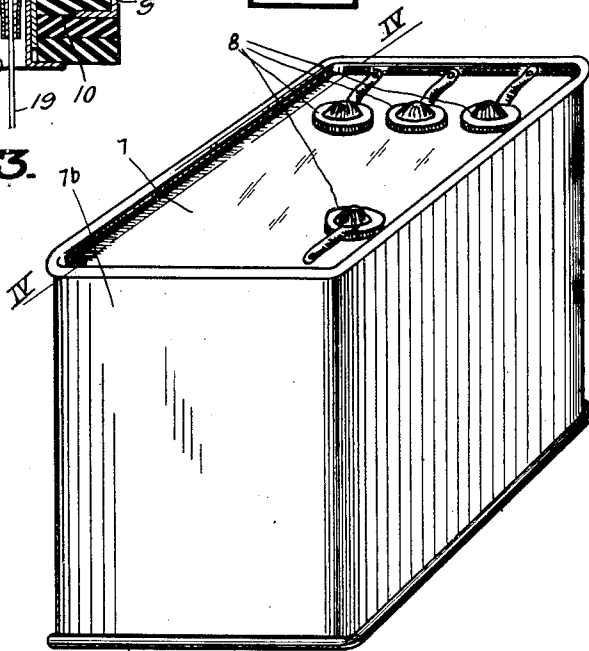


Fig. 2

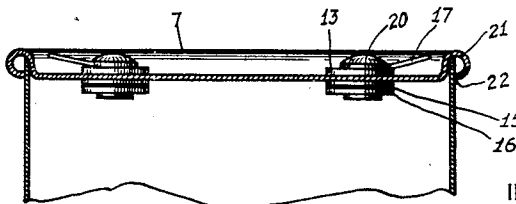


Fig. 4

INVENTOR
CORNELIS DE LANGE
BY *H. Swen*
ATTORNEY

UNITED STATES PATENT OFFICE

2,052,700

TERMINAL CONSTRUCTION

Cornelis de Lange, Eindhoven, Netherlands, assignor to Radio Corporation of America, a corporation of Delaware

Application February 4, 1932, Serial No. 590,861
In Germany February 11, 1931

2 Claims. (Cl. 173—311)

The present invention relates to condenser constructions and more particularly to a novel terminal construction for electrical instruments of the type that are enclosed within a housing.

It is known that in the case of stacked or wound condensers a casing is usually provided for enclosing the condenser units and thus protect them from moisture or air. In such devices it has been quite a difficult problem to provide suitable terminals for the condenser units so as to facilitate connection of the condenser units with external electrical circuits and at the same time provide the proper seal to protect the electrical apparatus from moisture or air.

The present invention has for one of its objects the construction of a terminal for enclosing electrical units such as condensers and the like which are economical to manufacture, effective and efficient from every point of view.

In the type of condenser here being discussed the casing is usually made of metal and it is preferable that all the seams present in the casing should be closed by flanging and/or soldering which enables the casing of being sealed so as to be perfectly liquid repellent. Sealing condenser casings by means of a flanging tool has hitherto not been adopted in manufacturing condensers. The process is further simplified if initially a casing is used which apart from the cover is moulded in one piece so that it does not present seams. In this case if the casing is made of metal the only operation for ensuring a liquid repellent seal consists in securing the cover in position by flanging and/or soldering. It is also possible for the casing to be made of material to be moulded which self-evidently prohibits the flanging and/or soldering of the cover so that another method has to be adopted for permitting of a liquid repellent seal being ensured.

The invention will be more readily understood by reference to the following detailed specification and the drawing.

In the drawing,

Figure 1 is a section through a condenser unit such as is shown in Figure 2 showing the compressed elements of the condenser.

Figure 2 is a perspective view of a closed condenser according to the invention.

Figure 3 is a sectional view of the passage of an electrode.

Figure 4 is a sectional view taken on the line IV—IV of Figure 2.

Referring to Figure 1, 1 designates a set of diagrammatically illustrated condenser units which after being wound on a cylindrical mandrel are

pressed by hand into the shape shown in the figure. After they are arranged adjacent each other as shown in Figure 1, pressing plates 2, preferably of sheet iron, are arranged on either side to engage the side surfaces of the exterior units and the aggregate consisting of units and pressing plates is housed in its casing 3 which is preferably of metal. For this purpose the units are first slightly clamped together, by compressing the assembled units and pressing plates by hand, viz., to such extent that the entire parcel slides easily into the aperture of the casing. It is, of course, obvious that the parcel will engage the casing pinchingly after being slipped in as a whole. The pressing plates 2 are provided with ribs 4 which pass along the length of the units and with ribs 5 arranged in a direction normal thereto. Thus a satisfactory stiffness is obtained at a very low thickness of material which is important because it is not desirable that the weight of the pressing plates should determine the total weight of the condenser. After the units are housed in the casing they are impregnated, for example, with petroleum jelly which is designated in Figure 1 by 6 and which fills the casing substantially. For the sake of simplicity the upper side of the units is shown in Figure 1 as being not covered with the impregnated means.

Figure 2 shows a condenser according to the invention as it appears when the cover is secured to it. Both the cover 7 and the bottom 7a are secured to the middle part 7b by flanging and/or soldering so that at these points a liquid repellent seal is secured. 8 designates the various points at which the various electrodes are taken out. One of these points is shown in detail in Figure 3. The cover 7 has a re-entrant part 9 in which an aperture 10 is formed for the passage of hollow flanged bushes 11 and 12 pinchingly slipped into one another. The flanged bushes are centered in the apertures and maintained insulated from the cover by means of discs 13, 14, 15 and 16 of insulating material which are pressed together by the flanges of the bushes so that a liquid repellent seal is obtained and any movement of the bushes in a lateral direction, is impossible.

The disc 15 consists of a felt layer impregnated with an insulating lacquer and serves essentially for the liquid repellent seal. The disc 14 lying in the re-entrant part 9 is preferably of rubber. The discs 13 and 16, which are preferably made of a very stiff insulating material, ensure that the rubber and the rubber and the felt disc engage uniformly over their entire surface the outer

and the inner wall respectively of the re-entrant part.

A contact lip 17 for the connecting conductors of the condenser is disposed under the flange of the bush 11. The bore of the bushes has slipped into it from without a small conical inwardly tapering pipe 18 through which a conducting wire 19 coming from a condenser unit passes from the interior towards the exterior where it is soldered to the pipe. The pipe is conical to prevent liquid solder from finding its way into the interior of the condenser and causing damage there. The point of soldering 20 is such that also the flanged bush 11 with the pipe and the contact lip 17 constitutes a mechanical and electric aggregate.

It has been established by a multiplicity of duration tests that the passage here described with a diameter of 10 mms. of the aperture 10 is perfectly capable of withstanding a working voltage of 1500 volts. It has also been found that such a passage conserves its good insulation resistance and hermetic properties when the condenser is caused in moist surroundings to reach a temperature such that the impregnating means is thinly liquid.

Figure 4 shows the manner of arranging the taking-through members in the cover and of flanging its edge at 21. 22 designates the layer of solder which with this kind of flanged seam must be provided in order to ensure a perfectly liquid repellent seal at the said point.

I claim:

1. A terminal construction for condenser assemblies of the type which are placed within a housing and wherein the condenser terminals are passed through apertures formed in re-entrant portions of the housing comprising in combination, a metallic terminal member centered in the aperture, means for insulating the terminal member from the housing comprising an outer insulation ring and an inner insulation ring, both of said rings being centered with respect to the metallic member and the aperture, said rings being arranged so as to bear upon the inner and outer walls respectively of the re-entrant portion of the housing, a pair of pressing rings cooperating with the insulation rings, a pair of tubular rivets, said rivets being arranged so that one thereof telescopes within the other, said rivets being centered in the aperture and arranged so as to press

the pressing rings toward one another, the frictional forces between the two rivets being sufficient to cause the pressing rings to maintain the insulation rings into close engagement with respect to the inner and outer walls of the housing adjacent the aperture, a tapered hollow member placed within the telescoped rivets and arranged so that the small end thereof is nearest the inside of the housing, said terminal member being arranged so as to pass through the tapered hollow member, an external contact strip and means for conductively joining the terminal member, the tapered hollow member and the external conductive member, said means also acting to seal said aperture.

2. A terminal construction for condenser assemblies of the type which are placed within a housing and wherein the condenser terminals are passed through apertures formed in the housing comprising in combination, a metallic terminal member centered in the aperture, means for insulating the terminal member from the housing comprising an outer insulation ring and an inner insulation ring both of said rings being centered with respect to the metallic member and the aperture, said rings being arranged so as to bear upon the inner and outer walls respectively of the housing, an inner pressing ring and an outer pressing ring cooperating with the insulation rings, an external contact strip positioned adjacent the outer pressing ring, a tubular metallic rivet device centered in the aperture and arranged so as to contact the contact strip and so as to force the pressing rings toward one another to cause the pressing rings to maintain the insulation rings in close engagement with respect to the inner and outer walls of the housing adjacent the aperture, said forcing action also acting to bring into good electrical contact the metallic rivet device and the contact strip, a tapered hollow member placed within said tubular rivet device and arranged so that the small end thereof is toward the inside of the housing, said terminal member being arranged so as to pass through the tapered hollow member and means for conductively joining the terminal member, the tapered hollow member, the rivet device and the external conductive member, said means also acting to seal the aperture.

CORNELIS DE LANGE.