April 22, 1930. J. H. REYNER ET AL 1,755,934

ELECTRICAL APPARATUS

Filed April 5, 1929 3 Sheets-Sheet 1

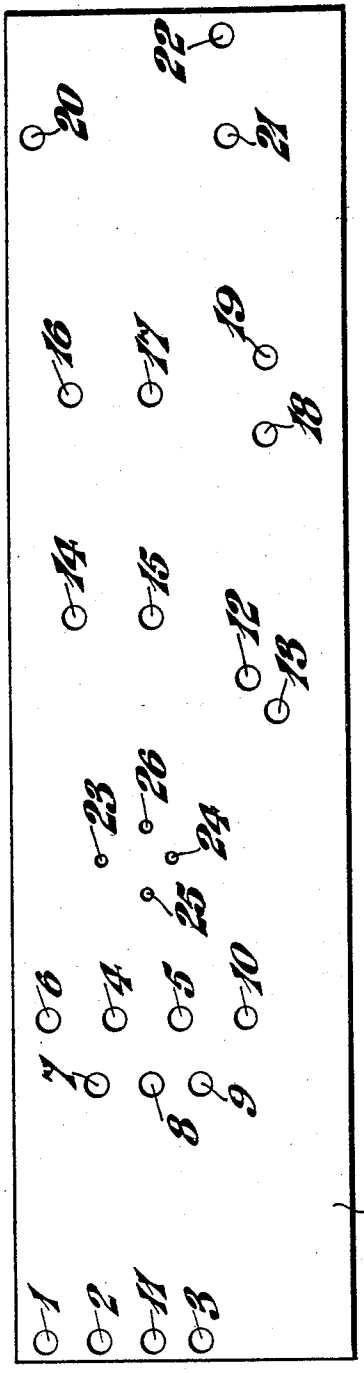


Fig. 1.

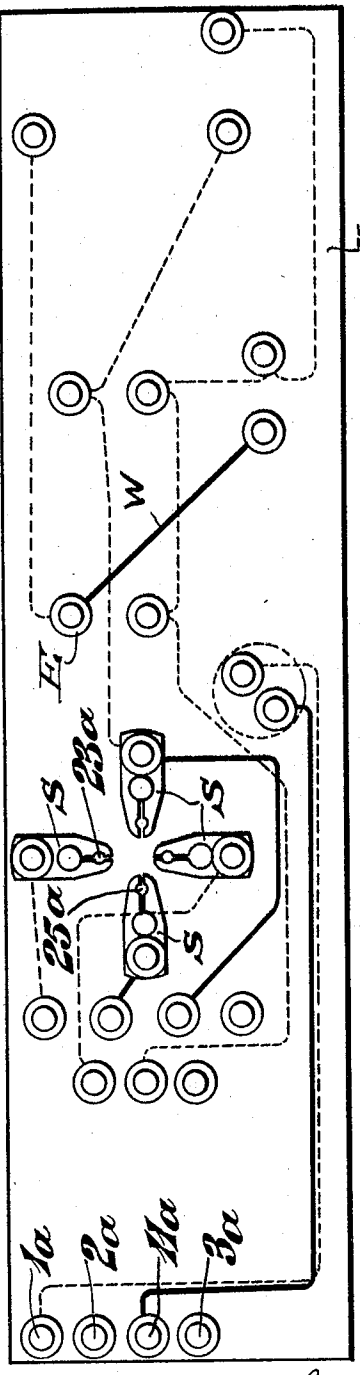


Fig. 2.

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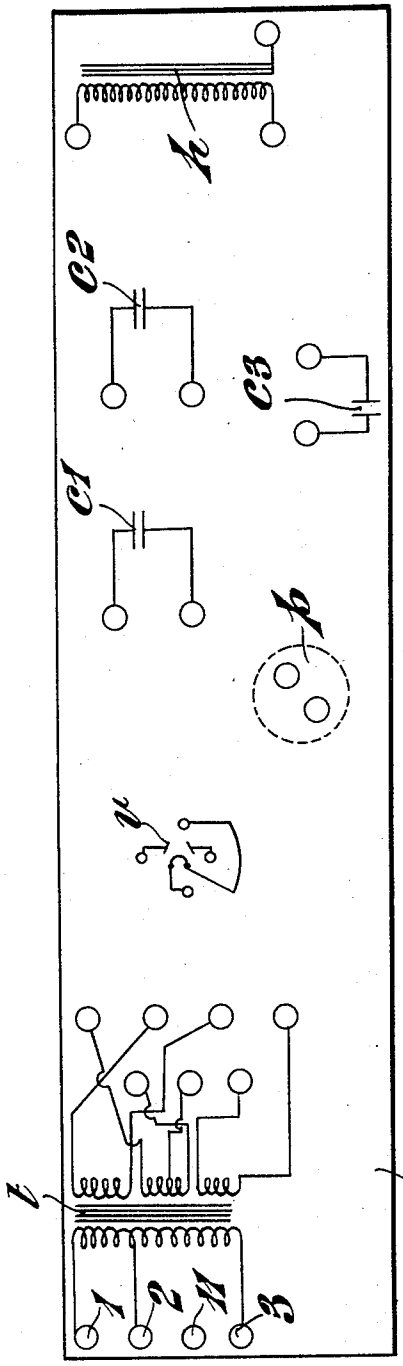


Fig. 3.

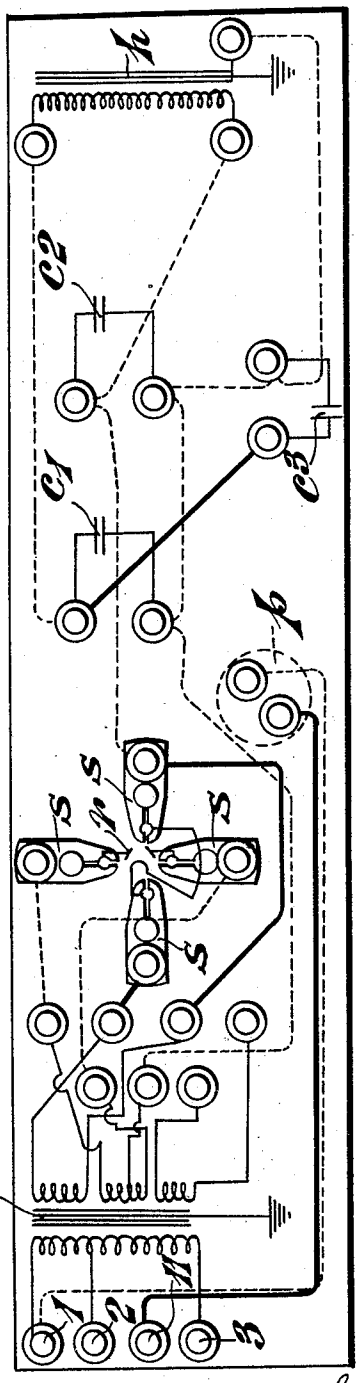


Fig. 4.

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ELECTRICAL APPARATUS

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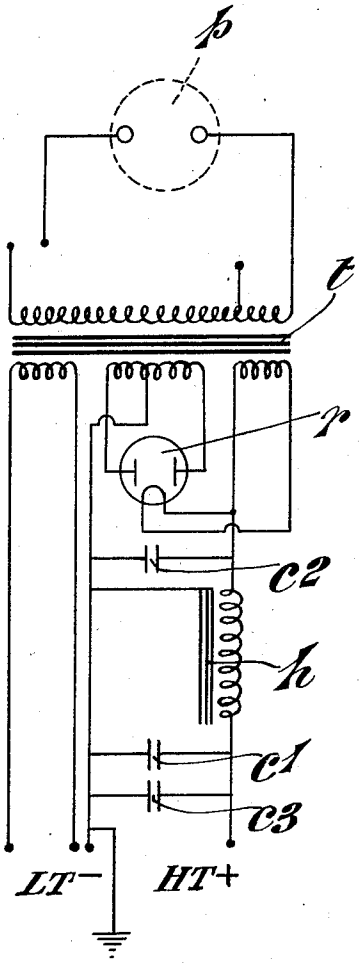


Fig. 5.

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UNITED STATES PATENT OFFICE

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ELECTRICAL APPARATUS

Application filed April 5, 1929, Serial No. 352,874, and in Great Britain April 3, 1928.

An application for this invention has been filed in Great Britain on April 3, 1928.

This invention relates to electrical apparatus and has reference to apparatus of that character where a number of components or elements are carried upon an insulating panel and electrically connected in the desired manner by suitable conductors.

In certain electrical apparatus, such for instance as apparatus for wireless reception it is quite usual to supply sets of components which, after they have been arranged upon a panel are electrically connected together by wires or other conductors and to facilitate the connecting up of the components and avoid, to a large extent, the use of a soldering iron it has been suggested to supply the insulating panel with the conductors imbedded in it or permanently applied to it.

This arrangement however, suffers from the defect that the panel can only be used for a particular circuit and, moreover, the manufacture of such wired panels is comparatively expensive. Now, it is quite a usual practice nowadays to supply sets of components for certain circuits and to supply with these sets wiring diagrams for the information of the user, and our present invention is best explained by saying that we propose to provide these wiring diagrams on thin sheets of insulating material with the necessary conductors actually in situ on the diagram.

Thus in accordance with our invention we provide a connection unit comprising a sheet or template of insulating material provided with all the necessary holes to receive the terminals of the various components, which terminals pass through holes drilled in the panel and thence through the holes in the sheet or template aforesaid all said holes in the template being connected up by properly arranged conductors which constitute the desired circuit and are permanently carried on either or both sides of the template.

A convenient arrangement is to provide a thin sheet or template of insulating material and to arrange upon its surfaces the conductors, which may take the form of thin copper strips, ribbons or wires, and then permanently attach these conductors to the template by eyelets. The eyelets will be such as to permit the passage through them of the various terminals which will be screw threaded where necessary to take securing nuts which will connect the template to the panel.

The panel may be supplied with the holes to receive terminals already drilled to correspond with the wired template or a plain panel may be supplied and the user will then use the template and drill the panel accordingly.

This arrangement involves the provision of all the components with projecting screw threaded terminals long enough to be passed through the holes in both the panel and the template and then be secured to the panel by means of nuts which will also secure the electrically connected template to the panel and complete the electrical circuit. By this arrangement the conductors can be arranged on both sides of the template, which has obvious electrical advantages, and the panel can be used for different circuits by the use of different templates. Moreover the apparatus can be built up from the components very rapidly and without any electrical knowledge, if a photograph or picture is supplied showing the various components in situ on the panel as all the erector has to do is to arrange the components in proper position on the panel, to push the template over the projecting terminals from the back and fastens nuts on to all the terminals when the components will all be in proper position and effectively connected in the circuit. It will be appreciated that by providing a sequence or series of these templates arrangements can be made for changing circuits or adding to an already normally complete circuit further stages of amplification.

Although primarily designed for wireless receiving apparatus it is clear that the broad principle of providing a wired diagram can be applied to other electrical apparatus where it is required to attach elements to a panel and then wire them up.

In order that the invention may be the more clearly understood an embodiment

thereof as applied to a rectifier for supplying a wireless receiving set from alternating current mains will now be described, reference being made to the accompanying drawings wherein

Figure 1 is a plan of the panel with the holes already bored.

Figure 2 is a plan of the connection unit or template with the connecting strips and eyelets in situ.

Figure 3 shows the several instruments in place on the panel located in the holes, said instruments being indicated in accordance with the usual diagrammatic convention.

Figure 4 is a plan of the assembled rectifier.

Figure 5 is a reproduction in less tortuous form of the diagram of connections shown in Figure 4.

Referring to the drawings the panel P has a number of holes 1–26 bored therethrough as shown in Figure 1. The holes 1–10 are adapted to receive the terminals of a transformer t in the manner indicated diagrammatically in Figure 3, said transformer having one tapped primary and three secondaries one of which is tapped, and therefore having ten terminals. The hole 11 is adapted to receive a terminal incorporated in the transformer structure whose purpose will appear hereinafter. The holes 12, 13 are adapted to receive the terminals of a connecting plug p, the holes 14, 15; 16, 17 and 18, 19 the terminals of respective condensers c^1 c^2 and c^3, and the holes 20, 21, 22, the terminals of a smoothing choke h. The said terminals may be incorporated rigidly in the structure of the instrument to which they appertain and they each comprise a downwardly projecting screw threaded shank which passes through the respective hole and projects beyond the back of the panel. The holes 23–26 are adapted to receive the four prongs of a rectifying valve v.

The connection unit or template U, comprises a thin sheet of insulating material having a number of holes 1^a–22^a therethrough which correspond in position respectively to the holes 1–22 and four holes 23^a–26^a which correspond in position to the holes 23–26. On the upper side said sheet has four flat metal strips s which are drilled and split as shown and arranged with their drill holes in registration with the holes 23^a–26^a. Disposed about each of the holes 1^a–26^a, the template U is provided with an eyelet E.

The various eyelets E are electrically connected by means of suitable conductors W secured in situ by the eyeletting operation. In order to prevent these conductors W from crossing and touching, some are located on one side of the sheet and some on the other. In the drawing the conductors W on the upper side are shown in full, and those on the lower side in dotted lines. Where long conductors are employed small clips may be provided passing over the respective conductors between their ends and through the sheet to retain said conductors in position.

In assembly therefore the panel P and the connection unit U are placed in registration with one another and the screw threaded shanks of the terminals of the several instruments are passed through the appropriate registering holes of said panel and connection unit. Nuts are then screwed on the projecting ends of the shanks and, the terminals being rigid with the respective components as aforestated, the mechanical assembly and the electrical connection of the converter is then simultaneously completed. When the prongs of the valve v are passed through the holes 23–26 and 23^a–26^a they will be held friction tight in the boreholes of the strips s and a system of connections will be established as shown in Figure 4 and more clearly in Figure 5. By connecting the terminals 12 and 13 of the plug p across the mains, the terminal 11 to either of the terminals 2 or 3 (by means of a suitable link) and the terminal 22 to earth, it will be clear to those skilled in the art that the terminals 9 and 10 will supply low tension and the terminals 18 and 19 high tension to a set.

What we claim and desire to secure by Letters Patent is:—

In a radio set, the combination of a non-conducting plate provided with a series of holes; metallic eyelets about said holes; and electrical connections attached to said plate by said eyelets.

In witness whereof we affix our signatures.

JOHN HEREWARD REYNER.
ARTHUR HERBERT CURTIS.