

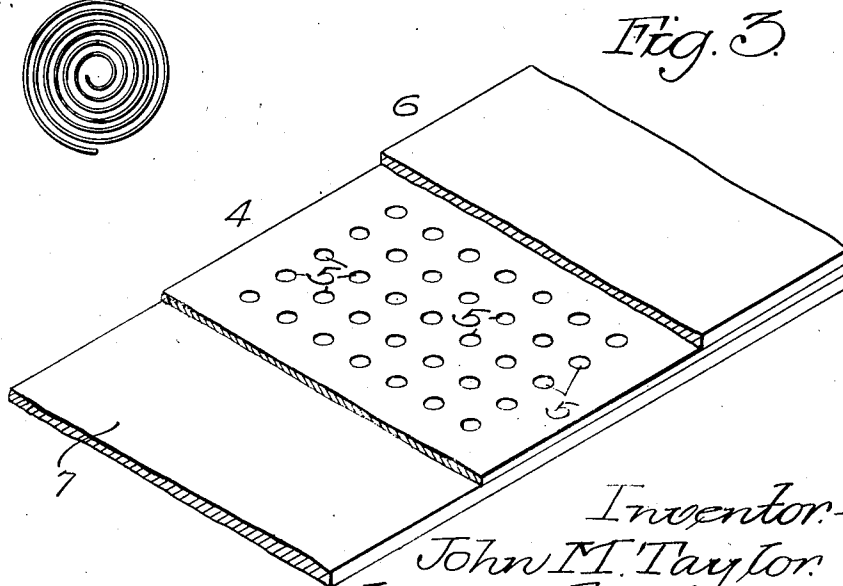
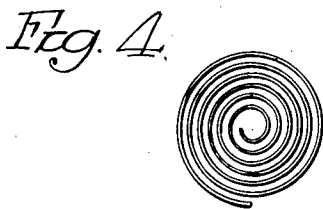
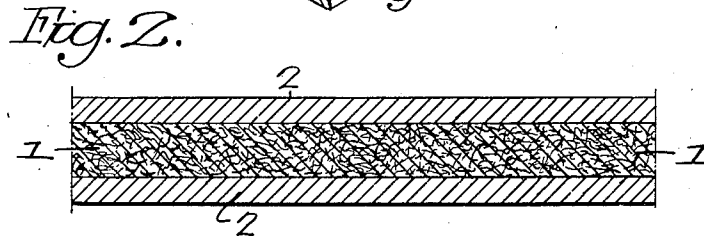
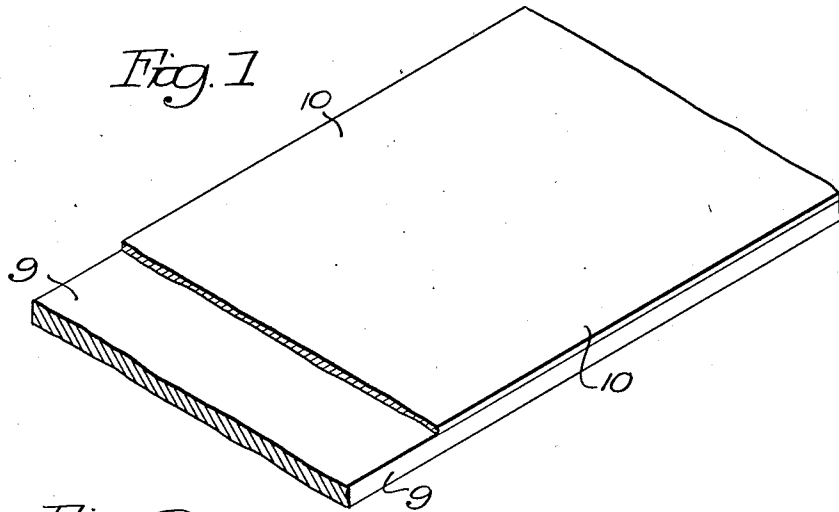
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INSULATED CONDUCTING ELEMENT

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UNITED STATES PATENT OFFICE.

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INSULATED CONDUCTING ELEMENT.

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One object of this invention is to provide a relatively simple, inexpensive and compact structure particularly adapted for use in the construction of electrical condensers as well as in other forms of apparatus or structures requiring highly insulated conductors in sheet form, and the invention further contemplates a novel process for making such insulated sheet conductors.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Fig. 1 is a fragmentary perspective view of a sheet-like conducting element constructed in accordance with my invention;

Fig. 2 is a vertical section on an enlarged scale illustrating another form of the invention;

Fig. 3 is a fragmentary perspective illustrating another modification of the invention; and

Fig. 4 is an end elevation showing the rolled up form of my conducting element.

In Fig. 2 of the above drawings, 1 represents a sheet of paper having mixed with its fibres thin metallic flakes, small particles of graphite, or other pieces of electrically conducting material in more or less finely divided form and so disposed as to constitute a more or less continuous, electrically conducting sheet. In accordance with my invention this composite sheet is passed through a vulcanizing or parchmentizing bath such as a solution of zinc chloride and thereafter has applied to one or both of its faces sheets 2—2 of paper which have likewise been subjected to a vulcanizing treatment. The mass is then subjected to heat and pressure, followed by subsequent washing with water and drying in the manner well known in the art of making parchmented fibre. Thereafter the completed composite sheet may be rolled up, as indicated in Fig. 4, or given any other desired form or assembled with suitable connections to permit of its use as an electrical condenser.

If desired either or both of the outside sheets or layers 2 may be omitted so that the final product consists of a sheet of vulcanized or parchmented cellulose fibres with which are intimately mingled or combined the particles or pieces of electrical conduct-

ing material. If desired such a sheet, when made to include metallic particles, may be subjected to a temperature or pressure or both necessary for fusing these particles so that they are caused to run together and form a more or less continuous metallic sheet with or without the outside insulating sheets.

Without departing from my invention I may employ a body of metallic foil such as indicated at 4 in Fig. 3 and provide it with a series of holes 5 or roughen its surface mechanically or chemically. With this sheet of foil, one or more sheets 6 and 7 of parchmented paper may be combined under heat and pressure and thereafter used in any suitable form in the manufacture of electrical apparatus such as condensers; it being noted that where the holes 5 are employed, the material of the parchmented sheets after immersion in the parchmentizing bath is forced through said openings by the application of pressure so that the sheets are firmly held together and intimately connected. In making the above composite sheets I preferably employ such metals as copper, aluminum or tin and it is noted that the surface openings or other mechanical interlocking of the metal and fibre sheets such as may be produced by roughening the surface of said metal, insures the permanence of the connection of the several sheets.

Again I may impregnate a sheet 9 of parchmented fibre with a phenolic condensation product such as the material known on the market as "condensite"—as described and claimed in patent to McIntosh No. 1,236,460, dated August 14, 1917. After such impregnation and while the condensation product is in the intermediate soluble, fusible stage or condition, I apply to the sheet of fibre so treated, a sheet of metallic foil or thin plate 10 having if desired, its surface roughened in any suitable manner, thereafter subjecting the same to pressure of about one thousand pounds to the square inch and to a temperature such as is produced by steam at one hundred and twenty-five pounds to the square inch, for a time sufficient to cause the condensation product to assume or pass into its final insoluble, infusible form. This treatment also causes the condensation product to strongly connect the roughened metal sheet to the parchmented and impregnated sheet so that the

whole forms a hard, mechanically strong plate available for use in the electrical art and especially for switchboards and instruments for radio work. Obviously, as illustrated in Fig. 3, the metal sheet may be placed between two sheets of parchmented and impregnated fibre and imbedded therein by the treatment described for connecting a single sheet of fibre with a metallic sheet.

10 I claim:

1. A sheet consisting of a body of metal

foil; with at least one sheet of parchmented fibre applied thereto and extending through openings in said metallic foil.

2. A sheet of parchmented fibre impregnated with a phenolic condensation product in its final insoluble stage, with a perforated metallic sheet mechanically interlocked with said fibre sheet through said perforations and held thereto by said condensation product.

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