

(No Model.)

S. W. KIMBLE.

INSULATING SUPPORT FOR ELECTRICAL APPARATUS.

No. 464,368.

Patented Dec. 1, 1891.

FIG. I.

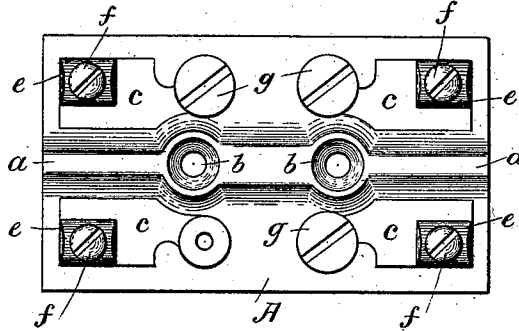


FIG. II.

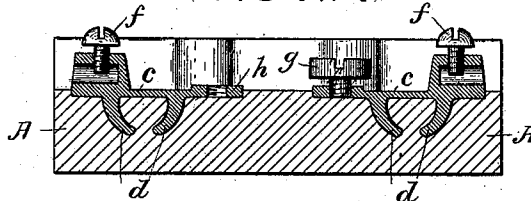


FIG. III.

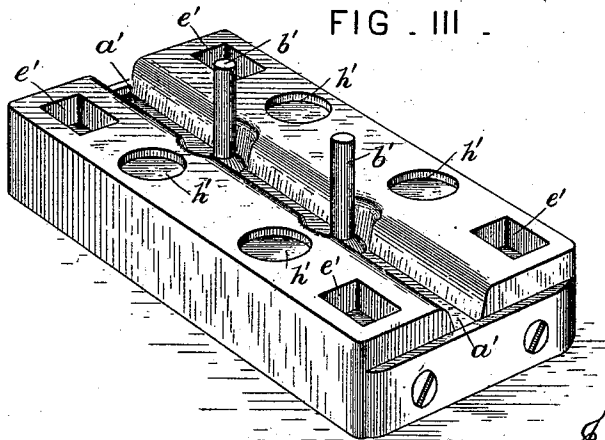
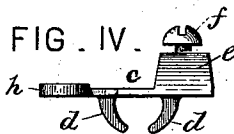


FIG. IV.



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UNITED STATES PATENT OFFICE.

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INSULATING-SUPPORT FOR ELECTRICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 464,368, dated December 1, 1891.

Application filed February 25, 1891. Serial No. 382,737. (No model.)

To all whom it may concern:

Be it known that I, SMITH W. KIMBLE, a citizen of the United States, and a resident of Denver, county of Arapahoe, and State of Colorado, have invented a new and useful Improvement in Molded Insulating-Supports for Electrical Apparatus, which improvement is fully set forth in the following specification.

This invention has reference to the construction and mounting of electrical connecting devices—such as binding-posts and the like—upon their non-conducting supports.

The materials commonly used for the insulating-supports of electrical apparatus are porcelain or other vitreous substances and rubber compounds known under various trade-names. In such devices high electrical resistance is the most important requisite, and frequently it is necessary also that the material should be able to resist the action of fire and to withstand a high degree of heat. For such purposes, therefore, vitrified substances are usually employed. The connection of the metallic fittings or conducting portions of the apparatus with the non-conducting support is usually a matter of some difficulty and expense. Metallic fittings cannot be set in plastic materials which are hardened by baking on account of the different coefficients of expansion of the two substances. On the other hand, many compounds which permanently harden by simple drying contract or shrink as the moisture dries out and therefore cannot be successfully molded around metallic fittings. Moreover, most compounds of this class contain vegetable matter and inflammable binding agents, as resin, shellac, and the like, or are for other reasons unsuitable for the purpose in view. On account of these difficulties the common practice of manufacturers of electrical appliances is to cast or mold the non-conducting support or block with depressions, holes, or spaces to receive the metal fittings, the latter being subsequently inserted and secured in place in various ways. Sometimes screws, bolts, and similar fastenings are used, and sometimes, as in making sockets for incandescent lamps, the connection is effected by means of cement.

The present invention contemplates the

permanent union of the conducting and non-conducting parts simultaneously with the molding of the base or supporting block, so that the article is turned out complete at one operation. It includes a material or compound which will unite perfectly with metal fittings partly embedded therein and which further possesses in a high degree the properties of resistance to heat and electricity. It further includes the particular construction of the metallic parts.

In carrying out the invention I employ a plastic or moldable compound of which the essential ingredients are pulverized mica, silicate of soda, preferably in form known as "water-glass" or "soluble glass," and a mineral substance, such as finely-crushed feldspar, powdered asbestos, or the like. The compound may be rendered harder and more refractory, when this is desirable, by the presence of sulphur, introduced in the form of commercial flour of sulphur, or of one of the natural sulphur compounds, as iron, copper, or antimony pyrites. The compound as a new composition of matter is not claimed herein, being made the subject of another application for Letters Patent. (See application, Serial No. 382,577, filed February 24, 1891, and application, Serial No. 382,871, filed February 26, 1891.) The substances specified are all of mineral origin and are capable of resisting heat to a very high degree. When combined, they are consolidated and compacted perfectly by means of pressure alone, and make a permanent connection with the metallic fittings, upon which they are molded.

The compound possesses in a high degree the property of electrical insulation, being fully equal in this respect to the best vitrified insulators.

In the drawings accompanying this specification I have illustrated the manufacture of a common form of thermal cut-out, in which the non-conducting base or support is required to possess in the highest degree the property of thermal and electrical resistance. As this apparatus is now made, the base, of porcelain or analogous material, is molded with recesses to receive the metal fittings and with holes extending entirely through it for the passage of screws, whereby the fittings are held in

place. The base after being molded is baked and then subjected to a somewhat expensive enameling process. Altogether it requires upwards of a week to manufacture these articles, which time is saved by the present invention. Moreover, the extension of the screw-fastenings through the block is found to be unsafe, in affording a passage for powerful high-tension currents in case of accidental contact with or proximity to other metallic or conducting objects. This danger is also avoided by means of the present invention.

In the drawings, Figure I is a plan view, and Fig. II a longitudinal section, of a thermal cut-out constructed in accordance with the invention. Fig. III is a perspective view of a die used in molding the device, showing the position of one of the fittings on the die; and Fig. IV is a detail view of the special form of fittings used in the improved device.

A represents the base or supporting block, of molded insulating compound, such as above described. In the form shown it has a central ridge *a*, through which pass bolt-holes *b* for attachment of the device to a wall or other support. On each side of this ridge is a pair of terminal connections embedded or set in the mass of the insulating block. These fittings consist each of a flat portion or plate *c*, from which project downwardly two teeth or prongs *d*, curved or deflected in such manner that when the plastic compound sets the fitting will be firmly held in place. At one end of the plate is the usual socket *e* and set-screw *f* for connecting one of the electrical conductors and at the other a binding-screw *g* for attachment of the fusible strip. As shown in Fig. IV, the plate has a boss *h* projecting slightly above its upper surface *c*. This boss takes the place of the washers usually placed under the fusible safety-strip.

The device is produced by means of the die shown in Fig. III, which has the central depression *a'*, corresponding to ridge *a*, the upright pins *b'*, and the recesses *e' h'*. In operation the four metal fittings are inverted

and placed on the die with the projections *e* *h* in the recesses *e' h'*. Thus in process of manufacture the boss *h* serves a useful purpose in assisting to hold the fitting in place. The die is placed in a suitable press, a sufficient quantity of the insulating compound fed in, the two parts of the mold brought together with considerable pressure, and the article is turned out complete and ready for use, the block being shaped and the metal fittings attached thereto at one operation.

Since the electrical conductivity of a mass is increased by moisture it is desirable to water-proof the block by impregnating it with paraffine or otherwise.

Many forms of thermal cut-outs are known, but all have the essential features of a non-conducting base and metallic terminal connections for the wires and fusible strips. The present invention is applicable not only to devices of this sort, but to many other electrical appliances, which consist of metallic conducting devices applied or attached to a support of insulating material.

While the compounds herein referred to are preferred and give good results the invention is not limited to them.

Having now fully described my said invention, what I claim is—

The combination, with the non-conducting block, of the terminal connectors, each having projecting teeth or lugs embedded in the material of the block which is molded and compressed around the same, and having on its upper surface projections for the attachment of electrical conductors, said projections serving also to keep the fitting in place while the insulating compound is molded around it, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SMITH W. KIMBLE.

Witnesses:

PHILIP MAURO,
JONA. B. CILLY.