Oct. 24, 1944. H. L. RAWLINS ET AL 2,361,240

ELECTRICAL APPARATUS

Filed Feb. 15, 1941 2 Sheets-Sheet 1

Fig. 1.

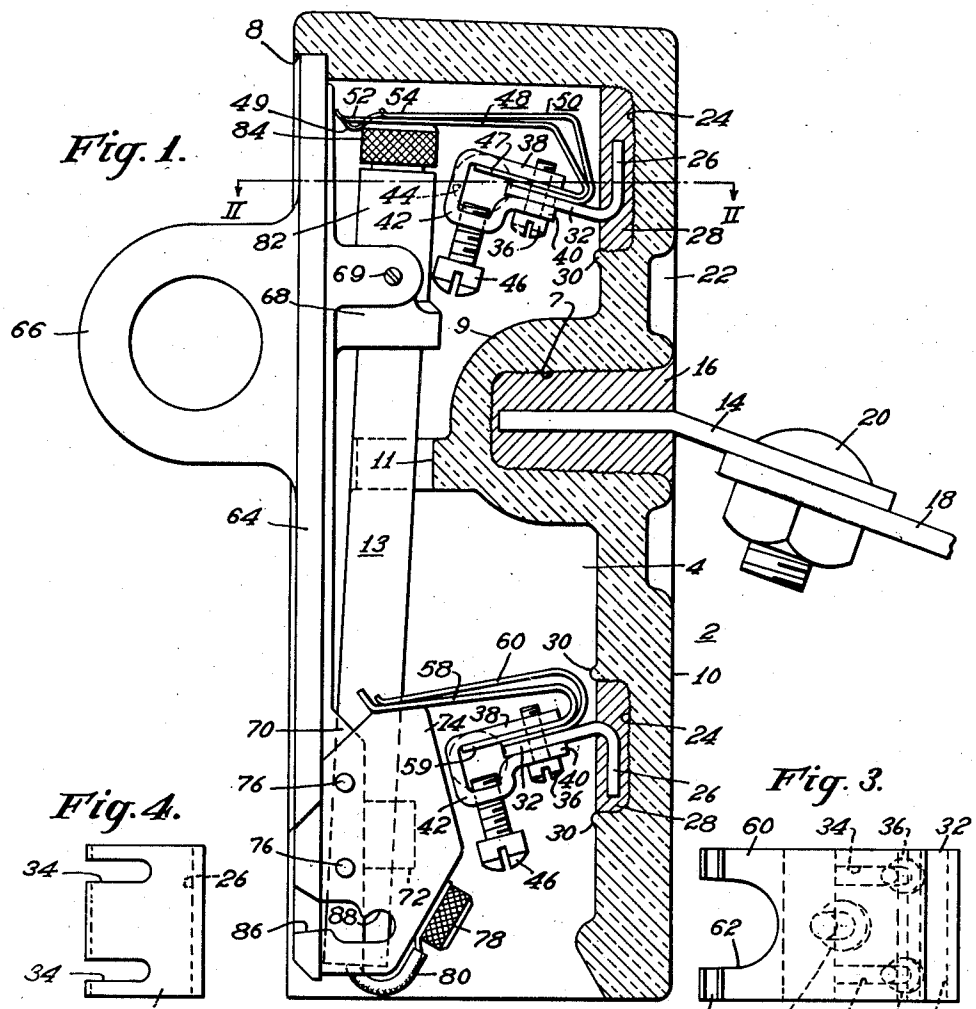
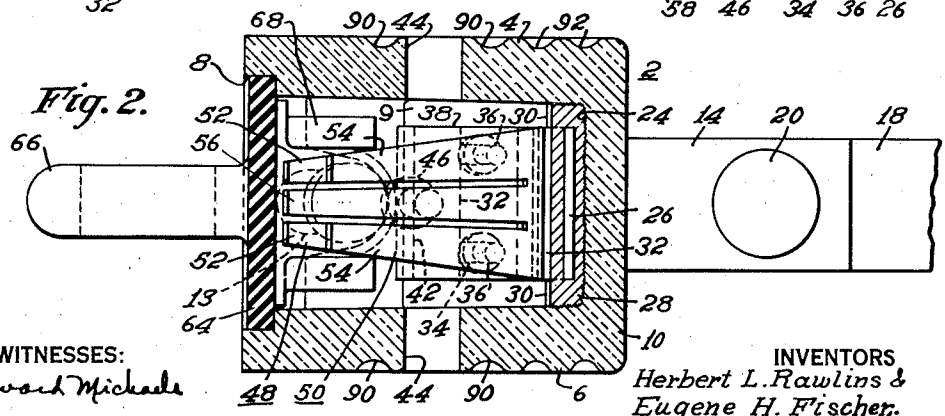


Fig. 4.

Fig. 3.

Fig. 2.



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Fig. 5.

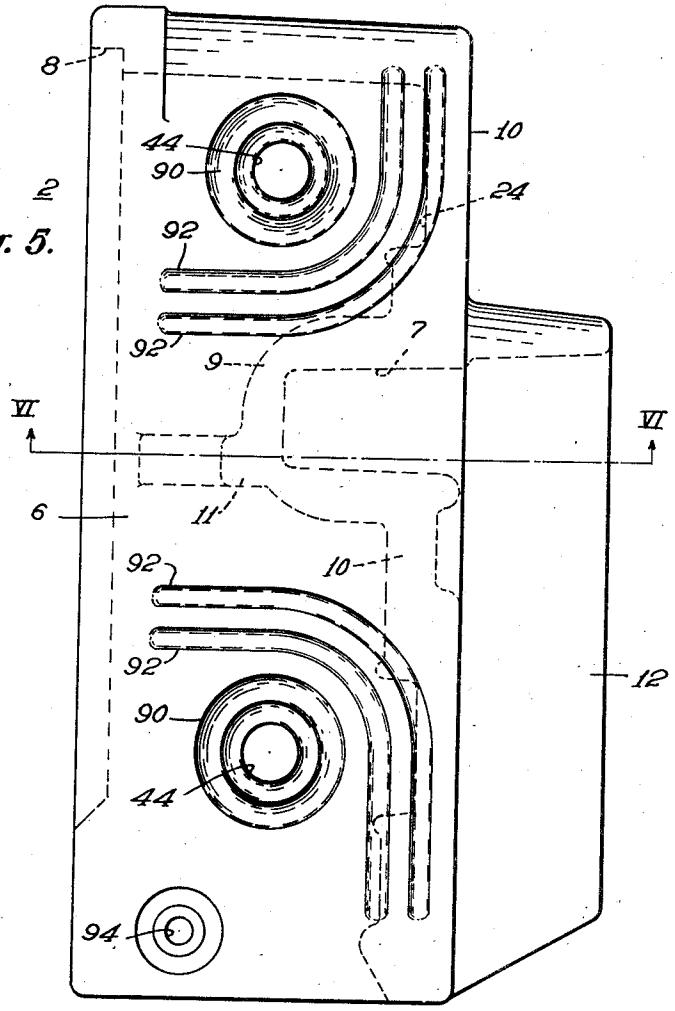
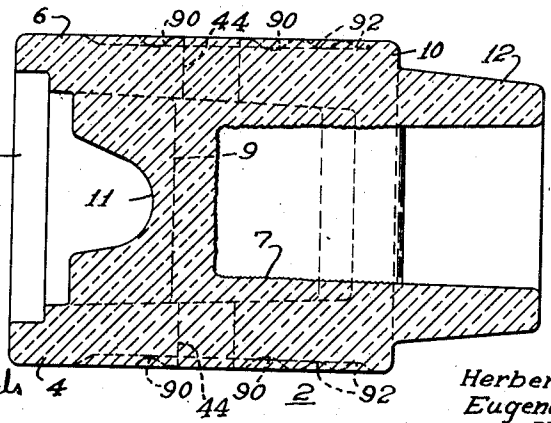


Fig. 6.



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2,361,240

UNITED STATES PATENT OFFICE

2,361,240

ELECTRICAL APPARATUS

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Application February 15, 1941, Serial No. 379,076

21 Claims. (Cl. 200—114)

This invention relates generally to electrical apparatus, and more particularly to high voltage fuses and the support or enclosure therefor.

High voltage fuses are commonly supported in insulating boxes, to not only protect the fuse from the elements but also to act as a support for the fuse and its terminal clips. This invention relates to fuse boxes made of a new type of porcelain which has the advantage over wooden boxes used formerly as fuse enclosures, in that due to the fact that such fuse enclosures are usually supported exposed to the elements, the life of a wooden box is short, and they are relatively larger in size and more complex than the box of this invention because it was necessary to employ lead-in bushings for the conductors, and to have relatively large dimensions to provide the necessary insulation.

The box of this invention also has the advantage over porcelain fuse boxes made by the so-called "dry process," which, while being some improvement over the old wooden boxes, were nevertheless limited in application due to the relatively high porosity of porcelain made by this process as compared to the boxes of this invention, which limited the voltage at which they could be used, besides limiting the mechanical strength thereof, thus rendering such boxes unfit for high voltage applications.

It was then found that an improved enclosure was obtainable by the use of a wet process porcelain. This type of porcelain is identified in the art as "wet process porcelain," but in order to obtain a porcelain which is sufficiently dense and non-porous to provide the necessary high dielectric and mechanical strength especially in the irregular form of a fuse box, this porcelain has in the past been obtainable only by a wet casting process. This process consumes a great deal of time and involves a great many operations, thereby rendering the resulting product relatively expensive, as compared to the new type of box herein disclosed.

In the wet casting process of making porcelain, absorbent molds are used, into which a liquid clay mix is poured. A head of the clay mix is maintained on the mold for insuring the deposit of clay in the mold as the moisture content of the clay mix is gradually absorbed by the mold until a solid article is formed. It takes from two to four hours before a completed fuse box can be formed in the mold which is sufficiently stiff to permit its removal and handling. Inasmuch as the absorbent molds are in practice made of plaster of Paris, they have a relatively short life, and even deteriorate so much during their useful life that in an effort to obtain some uniformity in the finished product it is necessary to subject the fuse boxes to smoothing and machining operations after taking them from the molds, for example, as by applying an abrasive material such as steel wool, and by drilling or cutting. This further increases the time, labor and expense necessary to produce a finished fuse box, so that by the time glaze has been applied, and the box fired, several days may have been required to manufacture just one fuse box.

Furthermore, due to deterioration of the plaster of Paris molds necessitating a subsequent smoothing operation which must be performed by hand, it has been impossible to obtain a uniform product. This has added to the cost of making these boxes because of the large number of spoiled and rejected boxes. Even in boxes which are put in service, difficulty has been experienced in obtaining a good fit of the covers and fuse clips, because the covers being of a composition material and the clips being of metal, are of substantially uniform size and often fail to properly fit the boxes because of the impossibility of obtaining a uniform product by the wet casting process. This is objectionable because unless the covers fit properly, foreign matter can enter the boxes and might cause electrical failure or improper operation and of course improper location of the clips will render proper electrical and mechanical engagement with a fuse carried by the door extremely difficult.

The doors for cutout boxes are usually supported on pivot pins carried, respectively, by opposite side walls of the box. In order to get anywhere near accurate alignment of the holes for these pivot pins in a fuse box made by the wet process casting method, it has been necessary either to provide removable cores in the mold or to provide an additional drilling operation after casting, with the latter method being preferable for the greatest accuracy. It can be appreciated that the alignment of such pivot pin supporting apertures is very important in obtaining a good fit of fuse box doors.

Another disadvantage of fuse boxes made by the wet casting process, is that it has been found that a certain percentage of the boxes will be warped and distorted in firing, probably due to the casting method wherein the box is progressively built up in a mold, to thereby further increase the spoilage and expense of manufacture.

This invention relates specifically to a fuse box made of a new type of porcelain which is

free of the above-mentioned defects of fuse boxes made in the above described manner of what is known as "wet process porcelain," and which furthermore may be manufactured for about one-half the cost of wet process porcelain boxes. This invention also relates to a novel fuse box structure which is especially adapted to this new type of porcelain, and to novel fuse supporting and engaging means for the box.

Accordingly, one object of this invention is to provide a novel type fuse box.

Another object of this invention is to provide a fuse box constructed of a new type of porcelain.

Another object of this invention is to provide in a device of the type described, novel fuse supporting and contacting means.

Another object of this invention is to provide a porcelain fuse box which is free from irregularities and defects and is economical to manufacture.

These and other objects of this invention will become more apparent upon consideration of the following detailed description of a preferred embodiment thereof, taken in connection with the attached drawings, in which:

Figure 1 is a central, longitudinal section of a fuse box constructed in accordance with this invention, and showing a fuse, door and contacts in elevation;

Fig. 2 is a transverse section view of the box taken on the line II—II of Fig. 1 with the fuse and upper contact in plan;

Fig. 3 is a top view of the lower contact of Fig. 1;

Fig. 4 is a top view of the lower contact supporting bracket of Fig. 1;

Fig. 5 is a side elevation of a slightly modified form of fuse box; and

Fig. 6 is a section taken on line VI—VI of Fig. 5.

In the drawings, there is illustrated a fuse box 2, which in accordance with this invention, is of a new type of porcelain. As previously stated, in the past, it has been possible to obtain a dense porcelain in the irregular form of a fuse box, only by the wet casting process, which however, has the inherent defects and disadvantages referred to above. In accordance with this invention, porcelain is formed from the usual clay mix which is preferably comparatively dry, preferably not more than 17% moisture, and preferably having a relatively small percentage of ball clay, on the order of 10%. This dry mix is then placed in the metal die cavity of a die press. An important feature of the invention is the arrangement of the clay mix in the die before pressure is applied. It has been found that in order to obtain a dense porcelain at least as good as that obtained by the wet casting method, it is essential to remove the entrapped air from the mix and cause intimate engagement of the clay particles. In making porcelain in accordance with this invention, entrapped air is removed, and the clay particles are forced into intimate engagement by means of three main operations all carried out by use of the die press.

(1) In order to remove air from the mix, some means should be provided for removing air from the die interior, such, for example, as by evacuation of the die when closed, by a vacuum pump or by the use of a heavier-than-air gas to displace the air, or the like.

(2) In order to provide for intimate engagement of the clay particles they must not only be compressed into intimate association, but must also be made to move relative to each other with what may be termed a relative sliding movement, in a direction extending at an angle to the direction of the compressing force. This may be accomplished by piling the mix in the die unevenly, and manually compacting the high point or points of the pile, whereby when the press is closed, pressure is exerted on the compacted high points of the pile to cause the clay particles to slide laterally from such compacted portions to less dense portions of the pile. The purpose of initially compacting portions of the pile, is to initially create relatively dense portions and cause the lateral sliding movement of the clay particles to take place under relatively high presusre, to fill the voids in the less dense portions of the pile, and thereby create a porcelain article having a relatively uniform high density. It has been found that best results are obtained if the portions of the pile manually compacted correspond to the deepest parts of the die. Thus, in making a fuse box such as that shown on the drawings in a die press which is formed to exert pressure in a direction substantially at right angles to the open front 8 and rear wall 10 of the box, the portions of the clay piled over those parts of the die adapted to form side walls 4, 6 and skirt 12 (Figs. 5 and 6), should be higher and should be initially manually compacted, so that when the press is closed, lateral sliding movement of the clay particles will occur from these portions into rear wall 10, and form a box of high uniformly dense porcelain.

(3) A relatively high press pressure should be used, for example, a minimum pressure of about 200 lbs. per square inch depending upon the complexity of the article to be formed. However, it has been found that while such high pressures are desirable, a mere sustained high press pressure is insufficient to obtain the desired porcelain density, especially in making fuse boxes, and this desired density is obtainable only by causing the press to engage the mix with an impact. Such an impact will cause the lateral sliding of the clay particles described above, into intimate engagement under high pressure. The amount of moisture in the mix is sufficient to permit relative lateral movement of the clay particles, and may be considered as just sufficient to permit in effect a plastic flow of the mix into the recesses of the dies. It has also been found that in order to obtain the desired density of porcelain it is necessary that a plurality of successive impacts be dealt. Thus, for example, in making fuse boxes, the press is preferably operated to deal three successive impacts to the article being formed, and it has been found that a plastic flow of the clay occurs on each impact and is usually completed on the third impact.

Porcelain fuse boxes made by the above-described new method have a density and consequent dielectric strength at least as good, and will run generally better than boxes made by the old wet casting method. Probably more important however, is the fact that fuse boxes made of this new porcelain can be made to close tolerances so that no additional operations are necessary before firing to obtain a uniform product. This makes it possible to form pivot apertures in the box by the pressing operation, and always obtain a good fit of the door, thereby eliminating drilling, scraping, shaving or coring operations. Tolerances, for example, of one percent in the length of fuse boxes are obtainable, and tolerances in boxes made by the wet casting process

are entirely unpredictable and run, for example, from three to six percent. Also it is found that there is negligible warping in firing of fuse boxes which are die-pressed, so that there is no spoilage from this cause. For example, in the manufacture of several hundred boxes to date, there has been no spoiled or rejected boxes.

From the foregoing, it is readily apparent that not only are fuse boxes made of die-pressed porcelain better, from an electrical and mechanical standpoint, but that their cost of manufacture is much less than fuse boxes of cast wet process porcelain. The boxes can be pressed in a few minutes, for example about three minutes, and then fired after a relatively short drying period without any other operations and without spoilage. Thus a fuse box may be pressed and in the firing kiln in substantially less than 24 hours, and this should be contrasted to the several days time necessary to produce a cast wet process porcelain fuse box, and its attendant high spoilage, as high at times as 20 to 30 percent.

It is, of course, recognized that it is old to form porcelain articles by the application of pressure using various methods, such as extrusion, with a subsequent forming operation or hot pressing with a plaster mold; but heretofore no one has been able to press in a metal die a relatively large irregular article of porcelain such as a fuse box, and obtain a vitreous, non-porous finished product suitable for use for a high voltage fuse box, or even comparable in density to cast wet process porcelain. The advantages of the die-pressed porcelain fuse box of this invention, are, therefore, believed to be readily apparent from the foregoing. It should also be noted that no heat is necessary in making die-pressed porcelain, it being a cold process except, of course, for firing the pressed box.

The specific fuse cutout shown on the drawings has been designed specifically for employing die-pressed porcelain, and, as previously stated, comprises a generally rectangular box **2** having opposite side walls **4** and **6**, a rear wall **10**, open front **8**, and open bottom. The rear wall **10** of the casing is provided with an inwardly extending, relatively large rounded protuberance **9**, terminating in an arcuate flange **11** adapted to closely surround a fuse tube **13** when in closed position in the box. The protuberance **9** and flange **11** provide an insulating barrier intermediate of the box between the fuse terminals, which are located at opposite ends of the box. As shown in the drawings, the protuberance **9** is provided with a socket **7** opening to the outer surface of rear wall **10**, for receiving a bracket arm **14** for supporting the box. Bracket arm **14** is secured in socket **10** by any desired cementing material, such, for example, as lead or the like, which is cast into the socket with bracket arm **14** in place, and the interior surface of socket **7** is preferably roughened, as by sanding, to secure a good bond with the cementing material **16**. Bracket arm **14** may be secured to a hanger bracket or support **18** for mounting the same on a cross arm or the like, for example, as by a bolt **20**. The outer surface of rear wall **10** of the fuse box is provided about the opening of socket **7**, with an annular depression **22** to increase the creepage distance to supporting bracket **14**.

It will be noted that the fuse box illustrated is particularly adapted to be made by the die-pressing method described, in that all inner facing surfaces of the box diverge outwardly toward the front of the box, so that a die may be inserted and withdrawn from the front of the box. At the same time, by using die-pressed porcelain, it is possible to form the exterior opposed surfaces of the box parallel, and also to form irregular surfaces on the exterior of the box by the use of a female die member having removable sides. Consequently, it can be seen that a die-pressed porcelain fuse box will present a particularly effective and regular exterior appearance, while permitting the formation of irregularities or indentations in the outer surfaces in the same operation by which the box is formed.

Depressions **24** are provided on the inner surface of rear wall **10** of the fuse box, adjacent the upper and lower ends thereof for supporting one leg **26** of a contact supporting bracket. By reference to the upper contact supporting bracket and depression **24**, it will be seen that the leg **26** of the contact supporting bracket is secured in depression **24** by cement material **28**, similar to the material **16** previously described, and that the depression **24** is roughened like socket **7** to secure a good bond. Ridges **30** are formed integral with wall **10** and extend along the free edges of both depressions **24**, to prevent the cement material **28** from running along the rear surface of rear wall **10**. Referring again to the upper contact of the cutout, it will be seen that the contact supporting bracket is provided with a second angularly disposed leg **32** having in the outer end thereof, inwardly extending slots **34** for receiving the shank of a screw **36** freely passing through an aperture in one leg **40** of a substantially U-shaped clamping member, and threadedly received in the other leg **38** of the clamping member.

The U-shaped clamping member is provided with an offset portion **42** in the leg **40** thereof, to provide an enlarged bight portion in line with conductor apertures **44** in the side walls of the box. A screw **46** is threadedly engaged with offset portion **42** of the clamping member, to secure a conductor in the bight portion of the clamping member. The fuse contact proper includes a contact strip **48** of any suitable conducting material such, for example, as copper or the like, and a resilient backing strip **50** which may be of any desired resilient material such, for example, as a phosphor-bronze alloy. Both strips are in general of the same form and include reversely bent inner end portions which are apertured to receive screws **36** so as to be assembled as a unit with the U-shaped clamping member.

The outer end of contact strip **48** is slotted to provide spaced contact arms **52**, and the outer end of resilient backing strip **50** is provided with a pair of spaced slots to form outer contact pressure arms **54**, substantially aligned with the contact arms **52** of the contact strip, and an intermediate independently movable latching strip **56**, positioned so that the outer end thereof overlies the slot in the end of the contact strip **48**, and it has an inwardly bent latch portion **49** adapted to extend below contact strip **48**.

It will be observed that the contact strip **48**, backing strip **50**, and U-shaped clamps **38, 40, 42**, are assembled by screws **36** so that they may be removed as a unit from supporting bracket arm **32** merely by loosening screws **36**. When these parts are removed from the supporting bracket, they are maintained in supporting relation by screws **36** passing through apertures in the inner ends of the contact and backing strips, so that these parts may be assembled as a unit, and rela-

tively easily mounted in position in the fuse box merely by slipping them over the leg 32 of a supporting bracket, and tightening screws 36. It should be noted that the inner end 47 of contact strip 48 extends beyond the inner end of backing strip 50 into the bight portion of the clamping member, so that a conductor in the bight portion, will be clamped against the contact strip by setscrew 46. With the contact in the position shown in Fig. 1 of the drawings, it is obvious that the contacting portions 52 of the contact strip are positioned to engage the upper terminal of a fuse, while latch portion 49 on leg 56 of resilient backing strip 50, is positioned to latch the fuse terminal in engagement with the contact strip. This particular arrangement insures that while the fuse terminal is moved into and out of engagement with the contact assembly, that the contact strip 48 and its resilient backing strips 54 will not be overstressed in latching the fuse terminal in place. That is, the only part which is overstressed by movement of the fuse terminal into and out of engagement with the contact strip, is the leg 56 of the backing strip which, as previously stated, is movable independently of strips 54 and the contact strip, so as not to affect the contact pressure.

The lower contact assembly and support is, in many respects, identical with the upper contact assembly and, therefore, like numerals have been applied to like parts to avoid undue repetition. It will be noted that the supporting bracket and U-shaped clamping member are identical with those used for the upper contact assembly, except that the supporting bracket is rotated substantially 180° from the position it occupies in connection with the upper contact assembly, so that leg 26 thereof extends downwardly from leg 32 instead of upwardly as in the upper contact construction. Also, the inner ends of contact strip 58 and resilient backing strip 60 which are received in the U-shaped clamping member, are substantially like the inner ends of contact strip 48 and resilient strip 50 for the upper contact, the only difference being that the outer ends of contact strip 58 and resilient backing strip 60 are substantially coextensive and similarly formed with an arcuate recess 62 to receive the fuse tube 13.

The fuse box is preferably provided with a door 64 of any desired composition material, provided with an exterior handle 66, and an interior integral apertured support 68 adjacent the upper end thereof for slidably receiving fuse 13. Support 68 is provided with a portion having a setscrew 69 threadedly engaged therethrough to secure the fuse 13 against longitudinal movement. Door 64 is also provided adjacent the lower end thereof with spaced, integral, longitudinally extending flanges 70, having an integral connecting member 72 forming a channel for receiving the lower end of fuse 13. A lower terminal casting 74 is adapted to be secured to door flanges 70, for example, as by rivets 76 or the like, and this terminal casting is, as shown, substantially trapezoidal in form, including an upper surface adapted to engage contact strip 58, and a lower side surface adapted to support a screw 78 for securing the tail 80 of a fuse link supported within the fuse to the terminal casting 74. Fuse 13 is also provided with an upper terminal ferrule 82, to which the other end of the fuse link is adapted to be secured, for example, as by a terminal cap 84 removably engaged with terminal ferrule 82. The lower fuse terminal casting 74 is also provided with a groove 88 forming a continuation of slots 86 in the sides of door 64, for receiving pivot pins supported respectively on side walls 4 and 6 of the fuse box.

From the foregoing, it is believed that it will be readily apparent that fuse 13 is carried on door 64 for pivotal movement to and away from a closed position with respect to fuse box 2, and when door 64 is in its closed position, fuse 13 will have its terminals 34 and 74 engaged, respectively, with contact strips 48 and 58. It will be noted that the contact strips have the outer ends thereof bent upwardly so that they and their resilient backing strips may be stressed to engage the fuse terminals with a predetermined pressure. Furthermore, the upper contact assembly is also adapted to latch the door and fuse in closed position, by means of an independently movable portion of the resilient contact backing strip, so that the contact strip itself is not called upon to perform this latching function and consequently will not be overstressed to weaken the same. The unitary assembly of the contact strips and their resilient backing strips with a clamping means, for not only securing the contact assembly in operative position in a fuse box but also to secure a line conductor thereto, is especially advantageous since it greatly simplifies the assembly and replacement of these parts. It should also be noted that the contacts, when in operative position, are rigidly secured in the fuse box so that they may be initially properly permanently positioned. The latch 49 for engaging the upper fuse terminal may be released merely by pulling outwardly on door handle 66 and the fuse and door may then be pivotally moved outwardly relative to the casing, and, when moved to a depending position with respect to the casing, these parts may be detached from the casing merely by moving the end of the door carrying terminal block 74 outwardly, to remove the box pivot pins out of slots 86 and 88.

In Figs. 5 and 6 of the drawings, there is illustrated a fuse box which is like that shown in Figs. 1 to 4 of the drawings, with the exception that it is especially designed for higher voltages, and to this end is provided with a substantially U-shaped skirt 12 on the outer surface of rear wall 10 of the box, with the closed end of the skirt positioned just above socket 7 in rear wall 10. This skirt provides additional creepage distance from the supporting bracket 14 to both upper and lower conductor apertures 44, and since the lower end is left open, there is no opportunity for foreign matter to accumulate within the skirt. It will be noted, by particular reference to Fig. 6, that the legs of skirt 12 are positioned substantially in alignment with side walls 4 and 6, respectively, of the box so that when the box is formed of die-pressed porcelain with the die pressure being exerted in a direction substantially parallel with the side walls of the box, the most extensive, or thicker portions, of the box will be in alignment with the direction in which pressure is exerted, so that the initial compacting operation previously referred to may be carried out along the side edges of the dies, to secure a flow of the porcelain mix laterally from these portions into the rear wall of the casing.

Both boxes shown in the drawings are preferably provided with annular grooves 90 about conductor apertures 44, and with grooved portions 92 having straight end portions connected by intermediate curved portions, so that these grooves will be positioned both between conductor

apertures 44 on each side wall of the box and between each conductor aperture 44 and supporting bracket 14, all for the purpose of increasing the creepage distance between conductors, and between each conductor and the supporting bracket which, of course, is grounded. Each box is also provided adjacent the lower end thereof with a countersunk aperture 94 in the side walls for supporting pivot pins for pivotally mounting the fuse tube and door.

It will be readily observed by reference to the drawings that by the use of die-pressed porcelain for a fuse box, it is possible to obtain nearly any desired irregularities in the outer surfaces of the box while at the same time maintain a symmetrical box structure having parallel exterior surfaces. Such constructions are extremely difficult, if not impossible, to obtain by the old wet casting process porcelain, because of the necessity of providing for removal of the box from the mold after it has been formed. Thus, a fuse box when made of die-pressed porcelain, will have mechanical and dielectric strength at least as good as that of the old cast wet process porcelain box, and has the further advantages of generally bettering these characteristics. Thus, for example mechanically, it is possible with die-pressed porcelain to obtain a uniform product manufactured to close tolerances so that a good fit of the box doors is always insured as well as proper positioning of the contact supporting portions and barriers within the box. Also, due to the extreme accuracy possible with die-pressed porcelain, a great many economies may be made in manufacture of these irregularly shaped fuse boxes which are not necessarily applicable to any other type of porcelain product, so as to reduce the cost of the poreclain for fuse boxes approximately by one-half.

Having described preferred embodiments of the invention in accordance with the patent statutes, it is desired that the invention be not limited to the paricular embodimens disclosed herein, inasmuch as it will be obvious, particularly to persons skilled in the art, that many changes and modifications may be made in these particular embodiments without departing from the broad spirit and scope of our invention. Accordingly, it is desired that this invention be interpreted as broadly as possible and that it be limited only by the prior art and by what is expressly set forth in the following claims.

We claim as our invention:

1. A new article of manufacture comprising an irregular shaped high voltage fuse box of uniformly dense, die-pressed porcelain.

2. A new article of manufacture comprising a high voltage fuse box of initially compacted and vacuum die-pressed porcelain.

3. A new article of manufacture comprising an irregular shaped high voltage fuse box of dense, non-porous, cold die-pressed porcelain.

4. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, confronting inner surfaces of the side walls of said box being flared outwardly, with opposed outer surfaces of said side walls being substantially parallel, and said box being of a single unitary piece of die-pressed porcelain.

5. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a recess in the outer surface of said rear wall for supporting a mounting bracket, an outwardly extending substantially U-shaped flange around said recess with the closed end of said flange adjacent the top wall of said box, the leg portions of the flange being substantially in alignment with the side walls of said box, and said box being formed of a single unitary piece of die-pressed porcelain.

6. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a recess in the outer surface of said rear wall for supporting a mounting bracket, an outwardly extending substantially U-shaped flange around said recess with the closed end of said flange adjacent the top wall of said box, said flange being outwardly tapered, the leg portions of the flange being substantially in alignment with the side walls of said box, and said box being formed of a single unitary piece of die-pressed porcelain.

7. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a contact supporting bracket having a slotted outer end on said rear wall, a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together, and adapted to be received in said bracket slot to secure said bracket and contact strip between the legs thereof, and means for securing a conductor in the bight portion of said clamp member.

8. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a contact supporting bracket having a slotted outer end on said rear wall, a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together and adapted to be received in said bracket slot to secure said bracket and contact strip between the legs thereof, means for securing a conductor in the bight portion of said clamp member, and said contact strip adapted to extend into the bight portion of said clamp member so as to be engaged by said conductor.

9. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a contact supporting bracket having a slotted outer end on said rear wall, a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together and adapted to be received in said bracket slot to secure said bracket and contact strip between the legs thereof, means for securing a conductor in the bight portion of said clamp member, and said securing means extending through an aperture in said contact strip, whereby said clamp member and contact strip are removable as a unit from said bracket.

10. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, a contact supporting bracket having a slotted outer end on said rear wall, a contact strip, a resilient backing strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together and adapted to be received in said bracket slot to secure said bracket, resilient strip and contact strip between the legs thereof, means for securing a conductor in the bight portion of said clamp member, and said contact strip adapted to extend into the bight portion of said clamp member so as to be engaged by said conductor.

11. A fuse box including spaced side walls connected by integral top and rear walls to form a box having an open front, means on said rear

wall for supporting a latching contact, said contact including a conducting strip and a resilient backing strip, and said backing strip including an independently movable latch portion offset from at least an outer portion of said conducting strip and adapted to project therebelow to independently latch a fuse terminal in engagement with said conducting strip.

12. Contact means for releasably engaging a fuse terminal or the like, including a contact strip having a forked outer end, and a resilient backing strip having an independently movable latch portion adapted to overlie and at least in part extend through the space between the outer end portions of said contact strip.

13. Contact means for releasably engaging a fuse terminal or the like, including a contact strip, and a resilient backing strip having an independently movable latch portion offset from at least an outer portion of said contact strip and adapted to project therebelow to independently latch said terminal in engagement with said contact strip.

14. A new article of manufacture comprising an irregular shaped high voltage fuse box of die-pressed porcelain having dielectric and mechanical strength characteristics at least as good as wet-process porcelain.

15. A new article of manufacture comprising an irregular shaped high voltage fuse box of die-pressed porcelain having dielectric and mechanical strength characteristics at least as good as wet-process porcelain, but having a greater degree of dimensional fidelity.

16. A fuse box including spaced side walls, connected by integral top and rear walls to form a box having an open front, spaced fuse contacts secured in said box to said rear wall, a door for the front of said box movably mounted thereon, a fuse carried by said door, spaced terminals carried by said fuse positioned to engage said contacts when said door is closed, and said box being of a single unitary piece of die-pressed porcelain having dielectric and mechanical strength characteristics at least as good as wet-process porcelain, but having a greater degree of dimensional fidelity, whereby proper engagement of said terminals with said contacts is obtained and a good fit of said door is assured when said door is closed.

17. A contact unit including a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together for securing the unit in operative position on a support member, one end of said strip positioned between the legs of said clamp member and apertured to receive said securing means.

18. A contact unit including a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together for securing the unit in operative position on a support member, one end of said strip positioned between the legs of said clamp member and apertured to receive said securing means, means for securing a conductor in the bight portion of said clamp member and said contact strip adapted to extend into the bight portion of said clamp member so as to be engaged by said conductor.

19. A fuse enclosure comprising a box portion having spaced side walls connected by integral top and rear walls, and a door portion for the front of said box movably mounted thereon, at least one portion of said enclosure being of a single unitary piece of uniformly dense die-pressed porcelain.

20. In a device of the type described, a support of insulating material, a bracket projecting from said support, a unitary terminal assembly adapted to be mounted on said support, said assembly including a substantially U-shaped member and a terminal member having one end loosely held assembled therewith by clamping means, said assembly adapted to be mounted on said bracket with said bracket received in said U-shaped member in engagement with said terminal member, whereby said clamping means is effective to secure said assembly to said bracket and to secure said terminal member against movement.

21. In a device of the type described, a support of insulating material, a bracket projecting from said support, said bracket having at least one slot therein opening at one edge thereof, a contact strip, a substantially U-shaped clamp member, means connecting the legs of said clamp member to force them together, and adapted to be received in said bracket slot to secure said bracket and contact strip between the legs thereof.

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