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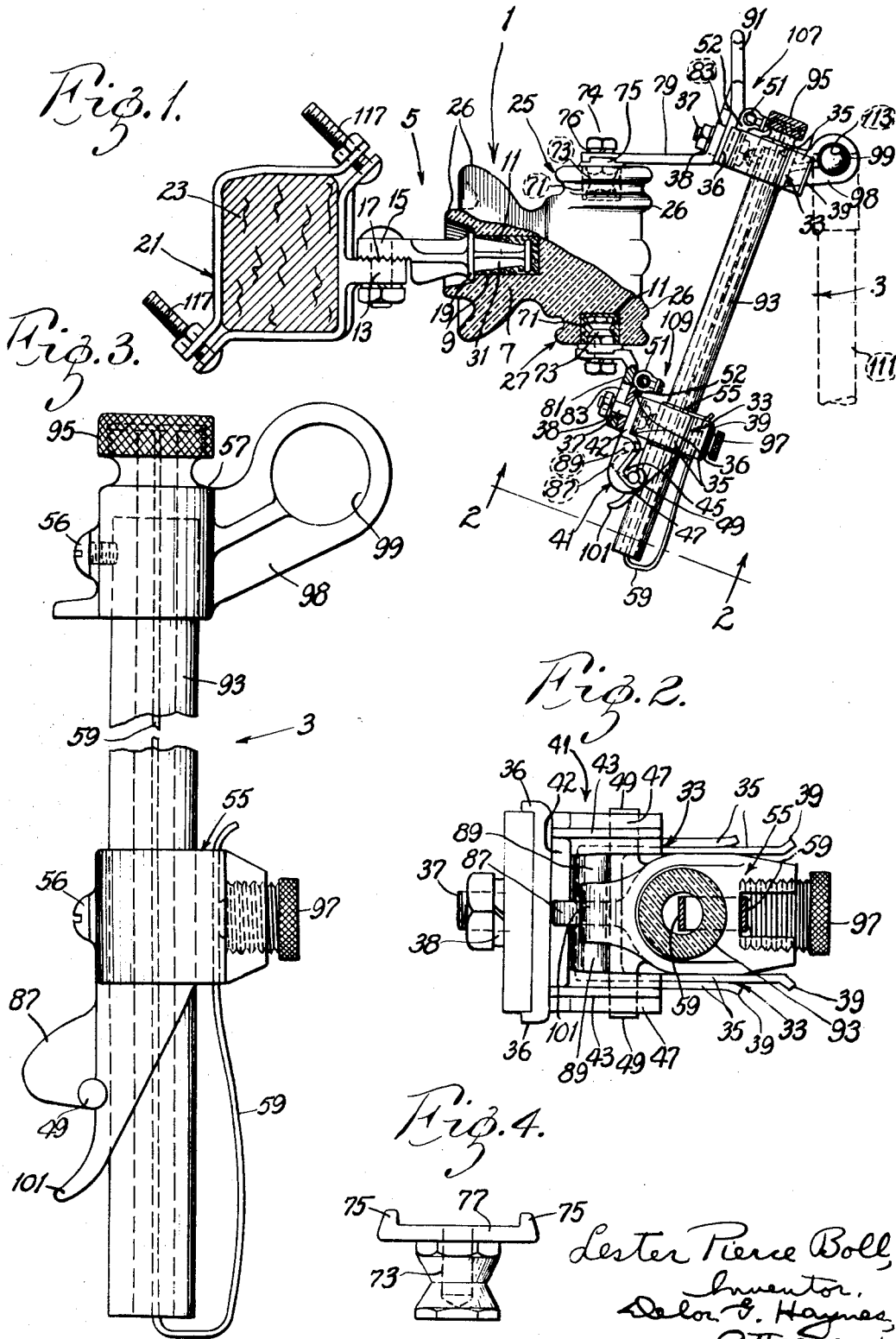
L. P. BOLL

1,925,624

HANGER

Filed March 25, 1931

2 Sheets-Sheet 1



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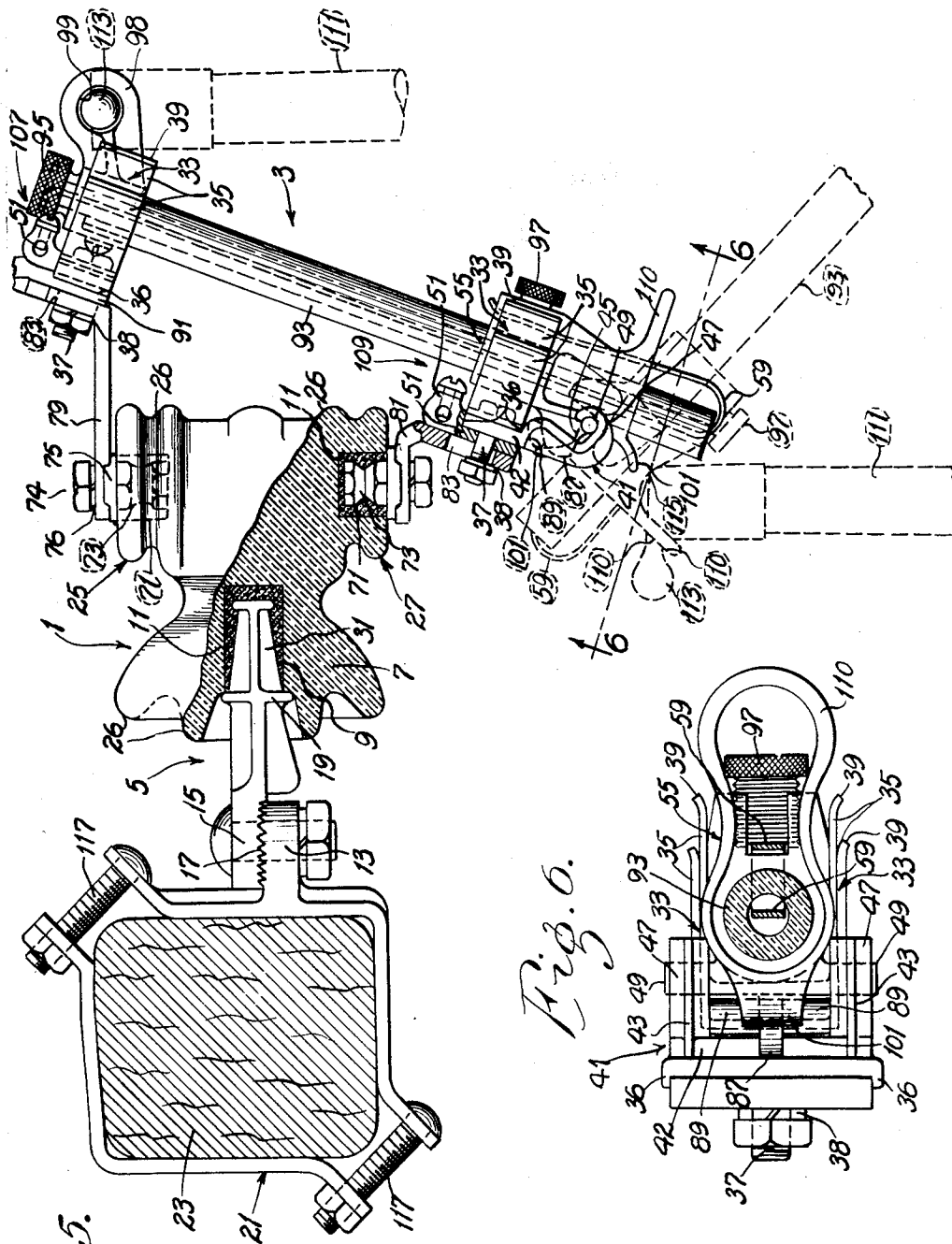


Fig. 6.

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UNITED STATES PATENT OFFICE

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HANGER

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This invention relates to hangers, and with regard to certain more specific features to a single piece, insulating hanger for demountably supporting switch blades, fuse cartridges and the like.

Among the several objects of the invention may be noted the provision of a hanger for more effectively and safely supporting in adjustable position a circuit breaker; the provision of a hanger of the class described comprising a one-piece insulator which provides a high flash over value and long leakage to ground; and the provision of a hanger of the class described which is of compact and economical construction, having a minimum number of parts providing maximum utility. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structure hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a side elevation of a preferred form of the invention, certain parts being shown in section;

Fig. 2 is an enlarged section taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged elevation of a demountable fuse cartridge;

Fig. 4 is an enlarged elevation of a stud base or bushing used on the hanger;

Fig. 5 is a view similar to Fig. 1, but larger and showing a modified form of cartridge; and,

Fig. 6 is an enlarged section taken on line 6—6 of Fig. 5.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a one-piece insulator, supporting at two points, a circuit breaker or switch 3, and being supported at a third point by a supporting pin 5 which is secured to a cross arm 23 by a clamp 21.

The insulator 1 comprises a supporting base 7 which has a recess 9 formed therein. The base 7 is provided with convolutions 25 for effecting a long leakage path. The recess 9 is adapted to loosely receive a ribbed end 31 of the supporting pin 5. The pin 5 also has a collar portion 19 which seats against the base portion 7, and which

enables the ribbed end 31 to be received into the recess 9 in a predetermined position. Cement 11 securely holds the ribbed end 31, and consequently the support 5, in said recess thereby enabling the supporting pin 5 to effectively support the insulator 1.

The supporting pin 5 is supported by the clamp 21 shaped to adjustably engage any suitable supporting member such as a cross arm 23. The mechanical connection between the pin 5 and the shackle 21, is adjustable in a horizontal plane, as is shown in Fig. 1. A swivel portion 15 of the pin 5, and a swivel portion 13 of the shackle 21, have corresponding radially grooved faces 17, which, when faced toward one another and bolted together, form a rigid but adjustable support. The adjustment is about an axis which is lateral of the axis of the pin 5. As shown in Figs. 1 and 5 the clamp 21 is adjustable, by means of diagonally arranged bolts 117, to engage cross arms having cross sections of different areas and of different shapes.

Switch supporting brackets 79 and 81 are respectively supported by convoluted arms 25 and 27 of the insulator 1, by means of bushing supports 73 and holding studs 74 which thread into said supports 73. The bushing supports 73 are positioned in recesses 71 of said arms 25 and 27, and are cemented therein by cement 11. The bushing supports 73 have upward extending lips extending from a base portion 77 and between which the brackets 79 and 81 are seated. The extensions 75 prevent rotational movement of the brackets 79 and 81 about stud 74. Lock washers 76 prevent loosening of the holding nuts on the studs 74. The brackets 79 and 81 are provided with slots 83 to adjustably mount contact assemblies 107 and 109, of the switch 3.

Referring particularly to the lower assembly 109, supported by the short bracket 81, it will be seen to comprise a line terminal member 51 next to said bracket, an open hinge member 41 next to said members 51, and a set of contacting clips 33, all fastened to said bracket 81 by a bolt 37. The lock washer 38 prevents loosening and the slot 83 provides for adjustment of the assembly along the bracket 81. As indicated at numeral 36 means are provided on the various assembly pieces to prevent any rotational movement between the positioned pieces.

The spring contacting clips 33 comprise co-operating U-shaped spring members 35 having guiding flares 39. As stated, the stud 37 holds the U-shaped members in place. The open hinge member 41 comprises a base portion 42, having

supporting legs 47 extending therefrom, and reinforced by ribs 43. Each leg 47 is formed to provide a recess 45 for purposes to be described hereinafter. Said base portion 42 has a web 89 positioned between said legs, which provides a reaction for a cam 87 to ensure rotation at the gudgeons 49 and prevent the reaction of a blown fuse from driving up the cartridge.

The upper terminal member 107 as shown in Fig. 1, comprises a base portion 52 on which is formed the terminal engaging portion 51. The upper bracket 79 supports the assembly 107, which also comprises a dead ending eye member 91, said terminal engaging member 51 and the contact clips 33 all joined to each other and to the bracket 79 by another stud 37. As shown in connection with the assembly 109, means 36 prevent rotational movement.

Referring now more particularly to Fig. 3 the fuse cartridge, adapted for mounting in this device comprises contacting blocks 55 and 57 for engaging the contacting members 33. The blocks 55 and 57 are mounted on an insulating tube 93, and are connected by means of a fuse wire 59, or the like, which passes through said tube. The fuse wire, joined to the contacting block 57 by means of the nut cap 95, passes down through the inside of the tube 93, out and around the lower end thereof and is terminated at the contacting block 55 by the stud 97. The contacting blocks 55 and 57 are secured to the tube 93 by means of set screws 56.

A handle 98, with an eye 99 formed therein, is integrally formed with the contacting block 57 and is provided for the purpose of applying a tool 111 thereto to pull the fuse cartridge and break the circuit.

The contacting block 55 has integrally formed therewith, gudgeons 49, a cam portion 87 and an extension 101.

Application of the fuse cartridge is accomplished by positioning the gudgeons 49 in the recesses 45. This is accomplished with the fuse in a more or less horizontal position, before contact is had with the spring clips 35, of the contacting clip 33, by positioning the gudgeons in the recesses 45 from the front. Next the fuse cartridge is swung upward into position, and the cam 87, reacting against the web 89, pushes the gudgeons 49 into the lower part of the recesses 45. As the fuse cartridge is swung upward still farther, the contacting blocks 55 and 57 are respectively seated in the contacting clips 33 of the assemblies 109 and 107. The lost motion recesses 45 permit the proper amount of play required for positioning the fuse cartridge in its contacts, and at the same time permit ready entry of the gudgeons 49 in their respective recesses.

When the fuse is pulled away from the contacts 33, the extension 101 limits the rotation of the fuse to that about the gudgeons 49. The extension 101 also helps to properly guide and align the fuse cartridge 93 for positioning the gudgeons 49 in the recesses 45.

The eye 91 on the other terminal 107 serves as an anchor for a lead wire which is wound around the eye 91 before being secured to the terminal engaging means 51. Thus the dead ending eye 91 serves to protect the terminal engaging means 51 of the assembly 107 from excessive strain due to the swinging or pulling of a wire connecting the terminal 51 to a transmission line.

Referring now more particularly to Figs. 5 and 6, there is shown a modification of the lower contacting block 55 of the fuse cartridge 3. Similar

reference characters in these figures show parts corresponding to those in Figs. 1 to 4 and will not be again described. In this modification the lower contacting block 55 has a handle or eye 110 formed integrally therewith, and in juxtaposition to the parts of the contacting block forming the gudgeons 49, the extension 101 and the cam 87, all of which are similar to those shown in Fig. 3. The handle 110 is provided for the purpose of applying the tool 111 thereto with which the entire fuse cartridge may be removed from the recesses 45 of the contacting assembly 109. The handle 98 of the contacting block 57 is provided to pull the cartridge 3 to break the circuit.

The solid line view of the cartridge in Fig. 5 shows the contacting blocks positioned on the cartridge 3, and in position in the contacting assemblies 107 and 109. The tool 111 is shown in dotted lines applied to said handle 98, and in position to pull the switch to break the circuit.

The dotted line position of the fuse, shows the cartridge pulled, the extension 101 abutting the web portion 89. This is the position of the fuse cartridge after it has been pulled from the clips 33 but before it is entirely removed from the recesses 45.

The tool 111 which has an extension 113, is also shown as subsequently applied to the handle 110 in its dotted position, and in place to remove the entire fuse cartridge 3 from the contacting assembly 109 by lifting the gudgeons 49 out of the recesses 45. As shown in this dotted line position of the tool and fuse cartridge 3, the extension 113, protruding through the handle 110, forms one point of contact with the contacting block 55 and the tool 111. Another point of contact made between the tool 111 and the contacting block 55, is shown at numeral 115, at which area the portion of the tool 111, juxtaposed to the extension 113, seats against the contacting block 55. By an upward movement of the tool 111, thus applied to the handle 110, the entire fuse block 3 is partially removed from the contacting assembly of the hanger. This upward movement results in the gudgeons 49 being guided out of the recesses 45 whereby said contacting block 55 is readily removed from the contacting assembly by a movement of the tool 111 to the right. It is noted that the points of contact of the tool 111 and the contacting block 55 are such that the tool 111 is adapted to carry the contacting block 55 when the tool is inserted in the handle 110 as shown in the dotted line position.

To position the fuse cartridge 3 in the contacting assemblies, the operation is reversed and the tool 111 is applied to the handle 110 first. The gudgeons 49 are seated in the recesses 45, and the extension 101 is seated against the web portion 89. The tool 111 is removed from the handle 110, and inserted in the handle 98, and pushed upward so as to position the contacting blocks 55 and 57 in their respective contacting clips 33.

An advantage of the handles 98 and 110 is that there is provided full protection to the operator from electrical shocks, inasmuch as the handles of the tools 111 are formed from an insulating material.

It is to be understood that instead of the fuse cartridge as described, there may be substituted, a switch blade. It is further to be understood that the particular shape of the insulator 1 described is not considered as limiting. Thus the arms 25 and 27, or the body 7 may be extended

to raise the flash-over value. For the same or different purposes the arms may be given different shapes.

An advantage of this type of hanger is the resulting simplicity and compactness. The hanger eliminates the usual frame support which formerly supported two or more insulators, to accomplish the same purpose which this single insulator now accomplishes. Furthermore, the flash-over value, which is obtained by this one-piece hanger, is equal to the flash-over value obtained from two insulators of approximately the same size as was formerly used.

The method of positioning the supporting pin 5 in the base portion 11 of the insulator 1 provides a more secure seating than has previously been accomplished, as where an interior nut was used.

Another advantage of the device is the adjustable feature, for the insulating block 1 may be moved in a horizontal plane on the clamp 21. The distance between the contacting clips 33 may be varied inasmuch as the upper and lower contacting assemblies are adjustable on their respective brackets. Thus flexibility between the parts is obtained.

The simplicity of the hanger permits of exceptionally low production cost with consequent advantage to the user.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A hanger comprising a single insulator having a base, a supporting pin affixed to said base, means for adjustably mounting said pin, a cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and means carrying terminal engaging elements engageable with said line terminals and adapted to effect electrical contact therebetween.

2. A hanger comprising a single insulator having a skirted base, a supporting pin affixed to said base, means for adjustably mounting said pin, the axis of the pin adjustment being lateral to its longitudinal axis and that of said base, a cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and means carrying terminal engaging elements engageable with said line terminals and adapted to effect electrical contact therebetween.

3. A hanger comprising a single insulator having a skirted base, a supporting pin affixed to said base, means for adjustably mounting said pin, an integral cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and means carrying terminal engaging elements rotatable on one of said brackets engageable with said line terminals and adapted to effect electrical contact therebetween.

4. A hanger for supporting a circuit breaker, said hanger comprising a T-shaped insulating portion, a supporting pin rigidly mounted in the leg of said T portion, and bracket supporting tines rigidly mounted in the arms of said T portion, and brackets mounted on said tines and

adapted to support the terminals of a circuit breaking means.

5. A hanger for circuit breaking means, said hanger comprising a T-shaped porcelain insulator, the leg of said T having supporting means rigidly cemented therein, and the arms of said T having bushings rigidly cemented therein, said bushings being adapted to support terminal contacting members of a circuit breaker, whereby complete insulation between said three supporting points is effected.

6. A hanger for circuit breaking means, said hanger comprising a T-shaped porcelain insulator, the leg of said T having supporting means rigidly cemented therein, and the arms of said T having bushings rigidly cemented therein, said bushings being adapted to support terminal contacts of a circuit breaker, whereby complete insulation between said three supporting points is effected, said insulating member also having convolutions formed thereon.

7. A hanger for circuit breaking means, said hanger comprising a T-shaped porcelain insulator, the leg of said T having supporting means rigidly cemented therein, and the arms of said T having bushings rigidly cemented therein, said bushings being adapted to support contacting members of said circuit breaker, whereby complete insulation between said three supporting points is effected, and a shackle adjustably supporting said supporting means.

8. A hanger for a circuit breaker, said hanger comprising a one-piece insulator having a base portion and at least two arms extending therefrom, a supporting pin, said base portion being adapted to rigidly seat one end of said supporting pin, terminal contact members for said circuit breaker, and said arms being adapted to support said terminals, whereby a high flash-over is provided between the three supporting points.

9. In combination with a circuit breaking means, a hanger comprising an insulating member having a base portion and arms integrally formed therewith and extending therefrom, supporting means, said base portion having a recess for receiving one end of said supporting means, said end being cemented in said recess, bracket supporting means, said arms also having recesses for receiving said bracket supporting means, said last-named means being cemented in said recesses, and brackets mounted on said bracket supporting means adapted to support terminals of said circuit breaking means.

10. In combination with a circuit breaking means, a hanger comprising an insulating member having a base portion and arms integrally formed therewith and extending therefrom, a supporting means, said base portion having a recess for receiving one end of said supporting means, said end being cemented in said recess, bushings, said arms also having recesses for receiving said bushings, said bushings being cemented in said recesses, and brackets, said brackets being mounted on said bushings and adapted to support terminals of said circuit breaking means, said insulating member being formed from porcelain.

11. A hanger for a circuit breaking means, said hanger comprising an insulating member having a base portion, arms extending therefrom and integral therewith, a supporting pin, said base portion having a recess to receive an end of supporting pin, and means on said supporting pin cooperating with said recess for seating and centering said end, said end being secured in said

recess, said arms having recesses for receiving bushings, said bushings being secured in said recesses, brackets, said brackets being mounted on said bushings and adapted to support terminal contacts for said circuit breaking means, said insulating member being formed from porcelain and having convolutions formed thereon.

12. A hanger for a circuit breaking means, said hanger comprising an insulating member having a base portion with arms extending therefrom and integral therewith, a supporting pin, said base portion having a recess to receive said supporting pin, and means on said supporting pin cooperating with said recess for seating and centering said pin, said pin being secured in said recess by cement, bushings, said arms having recesses for receiving said bushings, said bushings being cemented in said recesses, and brackets, said brackets being mountable on said bushings and adapted to support terminal contacts for said circuit breaking means, and a shackle, said supporting pin being adjustably mounted on said shackle.

13. A hanger for a circuit breaking means, said hanger comprising an insulating member having a base portion with arms extending therefrom and integral therewith, a supporting pin, said base portion having a recess to receive said supporting pin, and means on said supporting pin cooperating with said recess for seating and centering said pin, said pin being secured in said recess, bushings, said arms having recesses for receiving said bushings, said bushings being cemented in said recesses, brackets, said brackets being mountable on said bushings and adapted to support terminal contacts for said circuit breaking means, said bushings being non-rotatable in said receiving portion, and said brackets being non-rotatably mounted on said bushings.

14. A hanger comprising a single insulator having an insulating base on a given axis, at least one peripheral skirt about said axis on said base, a supporting pin on said base substantially parallel to said axis, supporting means rotatably engaging said pin for rotation lateral to said axis, an insulating T-head on said base, the axis of which is lateral to said base axis, spaced brackets on said head extending therefrom and a circuit breaking means mounted between said brackets.

15. A hanger comprising a single insulator having an insulating base on a given axis, at least one peripheral skirt about said axis on said base, a supporting pin on said base substantially parallel to said axis, supporting means rotatably engaging said pin for rotation lateral to said axis, an integral insulating T-head on said base, the axis of which is lateral to said base axis, convolutions on said head peripheral to its axis, spaced brackets on said head extending therefrom and a circuit breaking means mounted between said

brackets, said last-named means being angularly arranged with respect to said axes.

16. A hanger for a circuit breaking means, said hanger comprising an insulating member having a base portion with arms extending therefrom and integral therewith, a supporting pin, said base portion having a recess to receive said supporting pin, and means on said supporting pin cooperating with said recess for seating and centering said pin, said pin being secured in said recess, bushings, said arms having recesses for receiving said bushings, said bushings being cemented in said recesses, brackets, said brackets being mountable on said bushings and adapted to support terminal contacts for said circuit breaking means, said bushings being non-rotatable in said receiving portion, and said brackets being non-rotatably mounted on said bushings, at least one of said terminal contacts having a dead ending means to which a wire may be secured.

17. A hanger comprising a single insulator having a base, a supporting pin affixed to said base, means for adjustably mounting said pin, a cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and means carrying terminal engaging elements engageable with said line terminals and adapted to effect electrical contact therebetween, and a handle formed on at least one of said terminal engaging elements, said handle being adapted to operate said means carrying terminal engaging elements.

18. A hanger comprising a single insulator having a base, a supporting pin affixed to said base, means for adjustably mounting said pin, a cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and supporting means carrying terminal engaging elements engageable with said line terminals and adapted to effect electrical contact therebetween, and handles formed on each of said terminal engaging elements, one of said handles being adapted to operate said supporting means to make and break a circuit, and the other of said handles being adapted to remove said supporting means from said hanger.

19. A hanger comprising a single insulator having a skirted base, a supporting pin affixed to said base, means for adjustably mounting said pin, an integral cross portion on said base, brackets extending from the ends of said cross portion, line terminals on said brackets and supporting means carrying terminal engaging elements rotatable on one of said brackets engageable with said line terminals and adapted to effect electrical contact therebetween, and a handle formed on said terminal engaging element rotatable on said bracket, said handle being adapted to remove said supporting means from said bracket.

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