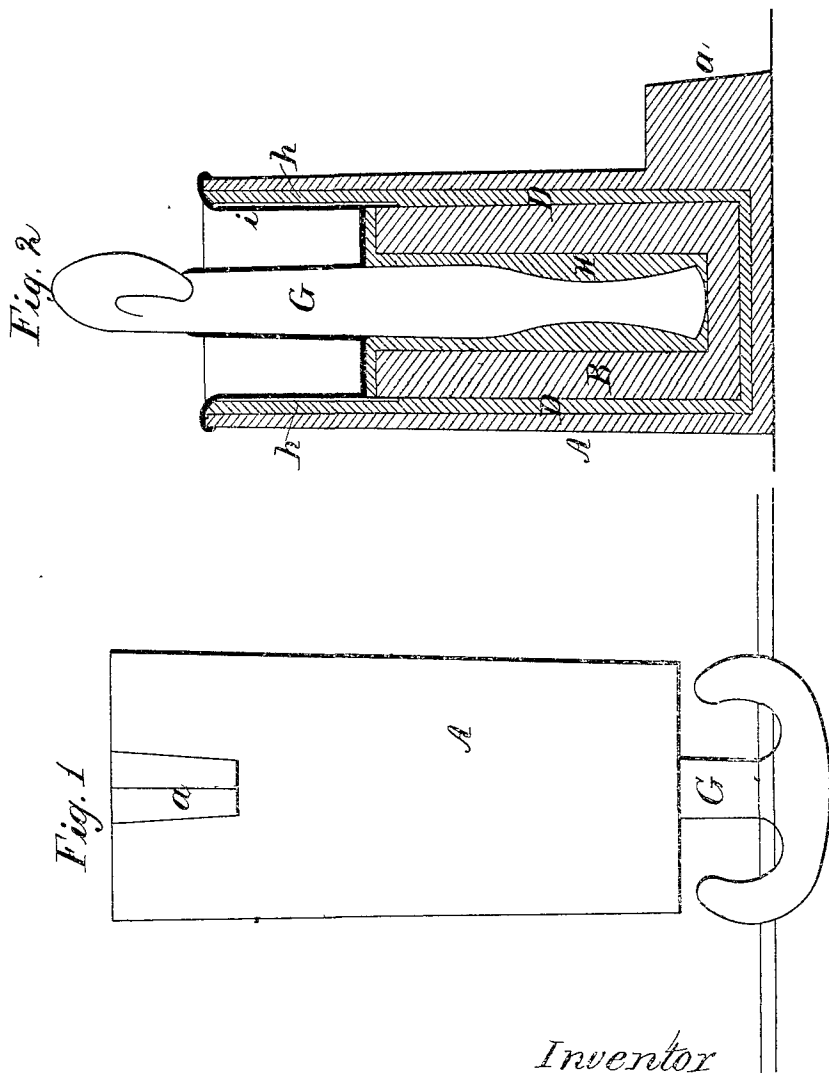


D. BROOKS.
INSULATOR FOR TELEGRAPH WIRES.

No. 45,221.

Patented Nov. 29, 1864.



Witnesses
W. Albert Steel.
Charles Hurron

Inventor
Henry Hewson
Atty for D. Brooks

UNITED STATES PATENT OFFICE.

DAVID BROOKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN INSULATORS FOR TELEGRAPH-WIRES.

Specification forming part of Letters Patent No. 45,221, dated November 29, 1864.

To all whom it may concern:

Be it known that I, DAVID BROOKS, of Philadelphia, Pennsylvania, have invented an Improvement in Insulators for Telegraph-Wires; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of the improved mode, fully described hereinafter, of constructing insulators for telegraph-wires, whereby the inconveniences resulting from the collection of water on and about the insulators during rainy and foggy weather are obviated.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is an exterior view of my improved insulator for telegraph-wires, and Fig. 2 a vertical section of the insulator inverted.

A is the exterior cast-iron casing of the insulator, the projection *a* of which serves as a means of attachment to the arms of the telegraph-poles.

B is a cylindrical block of glass, between which and the interior of the casing A intervenes a body, D, of sulphur, the glass being considerably shorter than the casing. In this glass block is a circular opening for the reception of the wire-holder G, which is secured by a mass of sulphur, H, the stem of the holder being made concave at opposite sides, so that it cannot be withdrawn from the glass by the weight or tension of the wires.

In preparing my improved insulators, I in the first instance place the glass on a table or slab and pour into the opening melted sulphur and then deposit the stem of the wire-holder G in the opening of the glass, which is perfectly secured to the holder when the sulphur has become hard by cooling. After this I cement to the upper edge of the glass a strip of paper, *h*, made in the form of a hollow cylinder, when the glass with its wire-holder is ready for attachment to the casing A. In order to do this I in the first instance heat the casing and then pour into the same a suitable quantity of molten sulphur, and into this I deposit the glass block with its paper cylinder *h*. As the latter extends to the upper edge of the casing A there will necessarily be

a body of sulphur between the said casing and the paper. The sulphur and the paper at the upper edge of the casing A are then trimmed off, after which, while the insulator is still in an inverted position, molten paraffine is poured into the space above the glass within the paper cylinder until the space is full. The insulator is then turned upside down, and the greater portion of the molten paraffine poured out, the remainder adhering to the paper and to the upper edge of the casing and sulphur, for care should be taken that the coating of paraffine extends over the edge of the casing.

When the coating of paraffine has coagulated I cover it with a varnish composed of beeswax, rosin, and paraffine, when the insulator is complete and ready for being attached to the pole in the position seen in Fig. 1.

Although sulphur affords an excellent medium for securing the wire-holder to the glass and the latter to the exterior casing of the insulator, and although sulphur when dry is a comparatively good non-conductor of electricity, it has a great affinity for water, with which, during rains or fogs, it soon becomes charged to such an extent as to neutralize its non-conducting properties; hence during rainy weather the sulphur would have a tendency to conduct the moisture from the edge of the casing to the wire-holder and through the paper were it not for the coating of paraffine, which penetrates the sulphur, adheres to the surface of the same, and effectually prevents the access of moisture to the wire-holder, the stem of which is also coated with paraffine and varnished.

I claim as my invention and desire to secure by Letters Patent—

1. The use in the manner described of a hollow cylinder, *h*, of paper or its equivalent, in connecting the glass block B to the casing A by means of sulphur.

2. Coating the interior of the space above the glass block, as well as the edge of the casing and of the sulphur near the same, also the stem of the wire-holder, with paraffine, in the manner and for the purpose described.

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

D. BROOKS.

Witnesses:

HENRY HOWSON,
JOHN WHITE.

D. BROOKS.
 Insulating Telegraph Wires.

No. 63,206.

Patented March 26, 1867.

Fig. 1

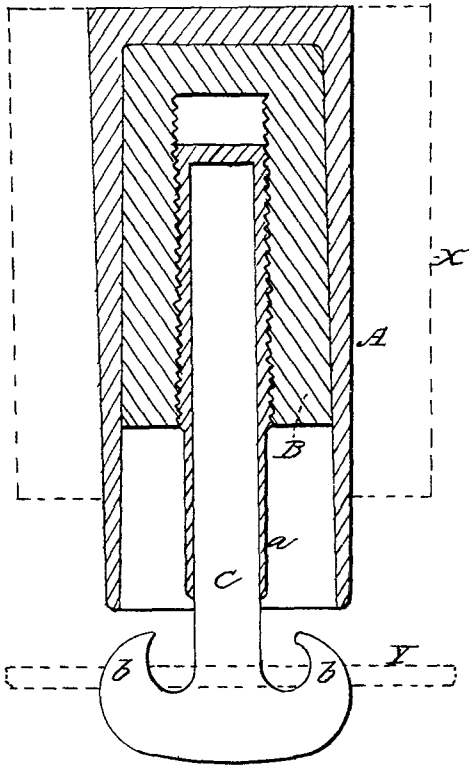


Fig. 2

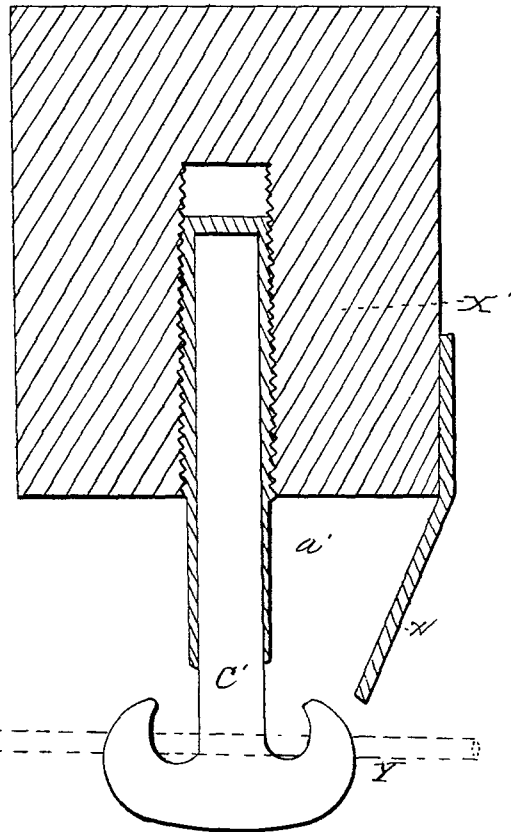
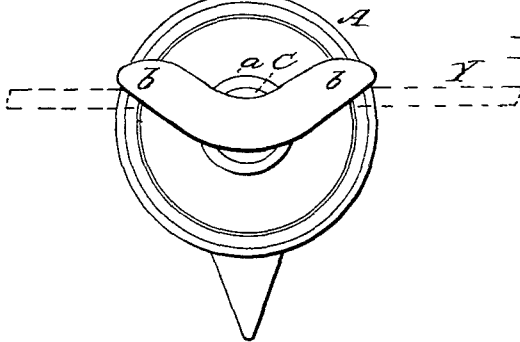


Fig. 3



Witnesses:

Wm. Albert Steele
S. C. Rossie Godwin

Inventor:

D. Brooks
 By his attorney
H. C. Rowson

United States Patent Office.

DAVID BROOKS, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 63,206, dated March 26, 1867.

IMPROVEMENT IN INSULATORS FOR TELEGRAPH WIRES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID BROOKS, of Philadelphia, Pennsylvania, have invented an Improvement in Insulating Telegraph Wires; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention relates to that class of insulators which are so constructed that an excessive charge of electricity thrown upon the wire will pass to an adjacent conductor without rupturing the material which insulates the wire-holder: and my invention consists of an arrangement of the parts of an insulator constructed in the manner fully described hereafter, whereby the above result is effected.

In order to enable others skilled in the art to apply my invention, I will now proceed to describe the manner of carrying it into effect, reference being had to the accompanying drawing, in which—

Figure 1 is a view illustrating one mode of carrying out my improvement in insulating telegraph wires.

Figure 2, a sectional view, showing an insulated holder heretofore used, and

Figure 3 an inverted plan view of fig. 1.

A, figs. 1 and 3, is a cylindrical metal case, which is secured firmly to an arm, X, attached to a telegraph pole or other suitable support. Within the case A is a block, B, of dry wood, glass, or other insulating material, in which is inserted a wire-holder, C, the latter being insulated by a coating, *a*, of hard rubber, gutta percha, or other suitable material. If desired, a screw may be cut on the outside of the insulating coating *a*, so that the holder may be secured in its place or detached with facility. At the lower end of the wire-holder are two curved arms or hooks *b b*, the ends of which are at such a distance from the lower edge of the case A that a wire, Y, may be passed between the two. A holder, consisting of a metal hook, C', (fig. 2,) with an insulated coating, *a'*, has heretofore been used, the insulated end of the holder being screwed directly into the arm X' of the pole or other support. It has been found that many of these holders gradually lose their insulating property and in a little while become worthless; as, when such holders are used, and when, by a stroke of lightning or from any other cause, the wire becomes surcharged with electricity, the latter will escape from the wire or holder to the nearest conductor by the shortest passage, which is generally through the insulating coating *a'* to the arm X', which, being wet, is a good conductor, the electricity in its passage through the coating perforating the latter; and the moisture passing into the said perforation and forming a conductor along which the weaker currents, afterwards thrown on to the wire, escape to the earth. This difficulty has been heretofore overcome by so arranging the insulated wire-holder in respect to an exterior conductor that an excessive current thrown on to the wire will pass from the holder to the conductor without penetrating the insulating material. My invention is intended merely to effect this object in an insulator of the construction above described, and illustrated in figs. 1 and 3 of the drawing, the difficulty being overcome by so adjusting the case A and the holder that the distance from any part of the latter through the insulating materials *a* and B to the nearest conductor is greater than the distance between the hooks *b b* and the case A. When, therefore, the wire is surcharged with electricity, there will be no inducement for the latter to penetrate the insulating coating *a* or wooden block B, as it can much more readily pass from the hooks *b* to the casing A.

I do not claim broadly the arrangement in an insulator of any description, of a conductor adjacent to a wire-holder for the purpose of conducting from the wire excessive charges of electricity, and thus preventing their passage through the insulating material; but I claim as my invention, and desire to secure by Letters Patent—

The metal casing A, insulating block B, and stem C, arranged and constructed as described, when the same are combined with arms or holders *b b*, so arranged that the distance between the holders and the case is less than that between the stem and case.

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

DAVID BROOKS.

Witnesses:

CHARLES E. FOSTER,
W. J. R. DELANY.

D. BROOKS.
Telegraph Insulator.

No. 69,622.

Patented Oct. 8, 1867.

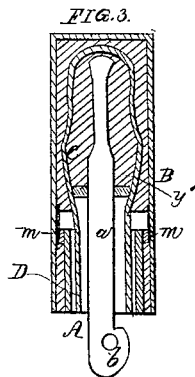
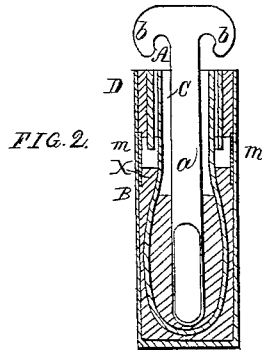
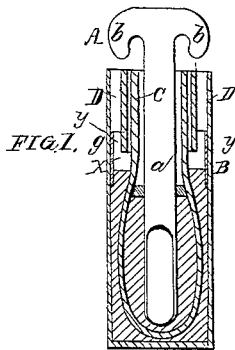


FIG. 4.

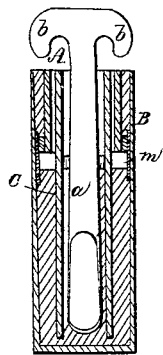
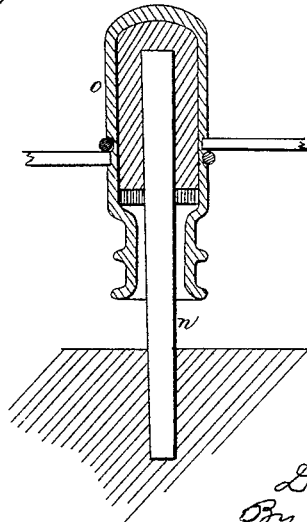


FIG. 5.



Witnesses.

Wm. Albert Lee
S. K. Stone & Co.

Inventor:
D. Brooks
By his Atty.
G. H. Hanson

United States Patent Office.

DAVID BROOKS, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 69,622, dated October 8, 1867.

IMPROVEMENT IN INSULATORS FOR TELEGRAPHS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID BROOKS, of Philadelphia, Pennsylvania, have invented certain Improvements in Insulators for Telegraph Wires; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the construction of insulators for telegraph wires, the main feature of my invention consisting of the combination, substantially as described hereafter, of a vessel or tube of blown glass with a telegraphic-wire insulator, so that a more perfect insulation may be attained.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figures 1 and 2 are sectional elevations of my improved insulator as it appears when partly completed.

Figure 3, an inverted sectional view of the insulator complete; and

Figures 4 and 5 modifications of my invention.

In figs. 1, 2, and 3, A is a cast-iron wire-holder, which consists of a stem, *a*, having at one end the usual curved arms *b b*. B is a metal case, open at one end, and C is a vessel of blown glass, the opposite sides of which are flattened, as shown in fig. 3. D is a hollow cylinder or band of glass, porcelain, or earthenware, and is of such a size as to surround the neck of the vessel C without being in contact therewith at any point. A band, *x*, of paper or other fabric is cemented to the inside of the case B, a short distance from the open end of the same. Melted sulphur is poured into the case, and the vessel C is inserted in the position shown in figs. 1 and 2, the upper surface of the sulphur being above the lower edge of the paper band *x*. Melted paraffine is now poured on to the sulphur in the case, and the cylinder D is so adjusted that it will be secured in the position shown in fig. 2 by the hardened paraffine. The remaining annular space between the cylinder D and the case B is then filled with melted sulphur. The stem *a* of the holder A is now introduced into the vessel C, and is secured by melted sulphur, with which the said vessel is partly filled, melted paraffine being poured onto the top of the sulphur after the latter has become hard. The case is now heated and then inverted, so that all the paraffine except that absorbed by the sulphur, and that which remains in the annular portion *m*, fig. 3, between the cylinder D and the paper band *y*, will escape. The case and its contents are then allowed to cool, after which paraffine is again poured into the vessel C, so as to cover the surface of the sulphur in the same, and form a ring or belt, *y'*, round the stem.

I have found, after lengthened and repeated experiments, that blown glass is a much more perfect insulating medium than glass pressed in a mould, for the reason that the surface of pressed glass contains minute fissures, in which moisture or dust collects, and permits the escape of electric currents. I have also found that the inner surface of a blown-glass vessel is much less liable to collect and retain moisture than the outer surfaces of the same. By the substitution, therefore, of a blown-glass vessel for the pressed or moulded cup or cylinder of glass heretofore employed, the wire-holder is much more perfectly insulated, while the amount of glass, and consequently the weight of the insulator, is reduced. A tube, *c*, of blown glass, as shown in fig. 4, may be substituted for the glass vessel illustrated in figs. 1, 2, and 3. A vessel of blown glass may be used in the manner illustrated in fig. 5, when it is desired to dispense with the case B and wire-holder, the wire in this case being wrapped round the vessel, which is adjusted to the pin *n* in a manner clearly shown in the drawing. The body *m* of paraffine contained within the annular recess *y* perfectly insulates the holder from the case, and the recess thus situated serves to retain the paraffine in its place, even if it should be melted by the heat to which insulators are sometimes exposed. By the use of a detachable cylinder, D, the recess for the reception of the paraffine may be formed after the vessel C has been introduced into the casing, the expense of so constructing the case as to form a recess or receptacle for the paraffine being thus avoided.

I claim as my invention, and desire to secure by Letters Patent—

1. The combination, substantially as described, of a vessel or tube of blown glass with a telegraphic-wire insulator, for the purpose described.

2. A wire-holder, A, and case B, in combination with a tube or vessel, C, of blown glass, arranged between the holder and case, and insulated from both, substantially as and for the purpose specified.
3. A recess, *y*, arranged between the case B and holder A, and containing paraffine for the purpose set forth.
4. A detachable cylinder, D, arranged in respect to the holder, case B, and vessel C, and insulated from the same, substantially as and for the purpose set forth.

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

DAVID BROOKS.

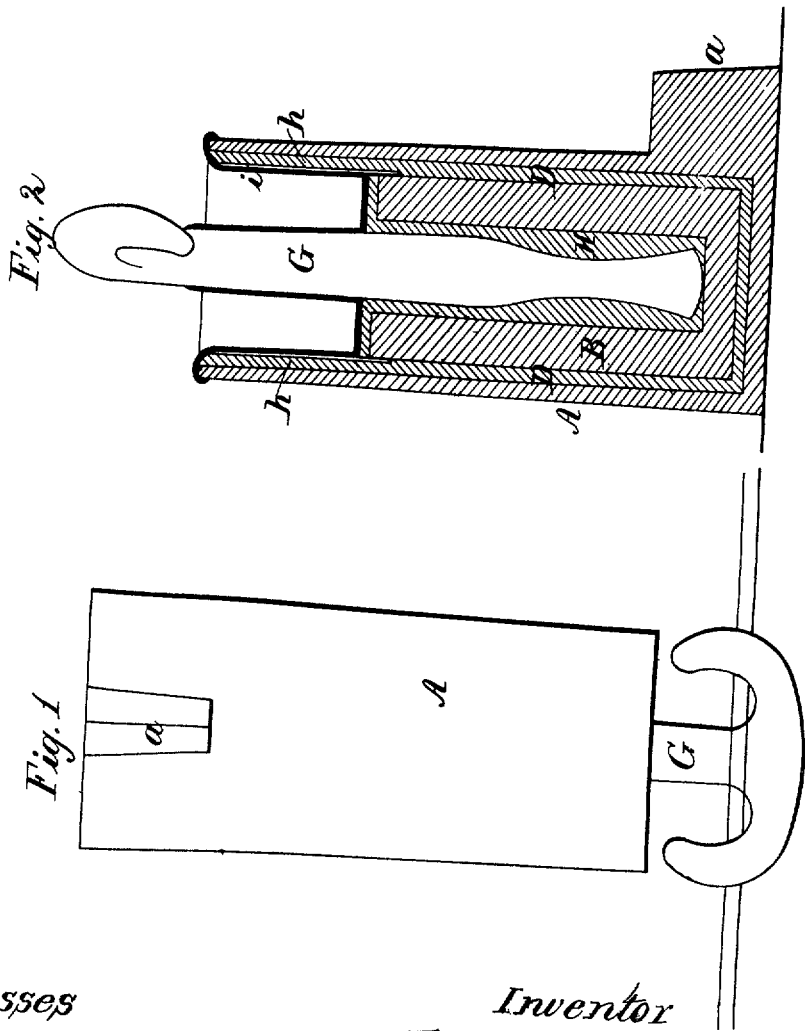
Witnesses:

JOHN WHITE,
C. B. PRICE.

D. Brooks.
Telegraph Insulator.

N^o 2,717.

Reissued Aug. 6, 1867.



Witnesses
W. Albert Steel.
Charles Huxson

Inventor
Henry Howson
Atty for D. Brooks

UNITED STATES PATENT OFFICE.

DAVID BROOKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN INSULATORS FOR TELEGRAPH-WIRES.

Specification forming part of Letters Patent No. 45,221, dated November 29, 1864; Reissue No. 2,717, dated August 6, 1867.

To all whom it may concern:

Be it known that I, DAVID BROOKS, of Philadelphia, Pennsylvania, have invented an Improvement in Insulators for Telegraph-Wires; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of the improved mode, fully described hereinafter, of constructing insulators for telegraph-wires, whereby the holder to which the wire is attached is effectually insulated, and the inconveniences resulting from the collection of water on and about the insulators during rainy and foggy weather are obviated.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawings, which forms a part of this specification, and in which—

Figure 1 is an exterior view of an insulator for telegraph-wires constructed according to my improvement; and Fig. 2, a vertical section of the insulator inverted.

A is the exterior cast-iron casing of the insulator, the projection *a* of which serves as a means of attachment to the arm of telegraph-pole.

B is a cylindrical block of glass, between which and the interior of the casing A intervenes a body, D, of sulphur, the glass being considerably shorter than the casing. In this glass block is a circular opening for the reception of the wire-holder G, which is secured by a mass of sulphur, H, the stem of the holder being made concave at opposite sides, so that it cannot be withdrawn from the glass by the weight or tension of the wires.

In preparing my improved insulators, I in the first instance place the glass on a table or slab and pour into the opening melted sulphur, and then deposit the stem of the wire-holder G in the opening of the glass, which is perfectly secured to the holder when the sulphur has become hard by cooling. After this I cement to the upper edge of the glass a strip of paper, *h*, made in the form of a hollow cylinder, when the glass with its wire-holder is ready for attachment to the casing A. In order to do this, I in the first instance heat the casing and then pour into the same a suitable

quantity of molten sulphur, and in this I deposit the glass block with its paper cylinder *h*. As the latter extends to the upper edge of the casing A, there will necessarily be a body of sulphur between the said casing and the paper. The sulphur and paper at the upper edge of the casing A are then trimmed off, after which, while the insulator is still in an inverted position, molten paraffine is poured into the space above the glass within the paper cylinder until the space is full and the paper and sulphur have become thoroughly saturated with the paraffine. The insulator is then inverted and the greater portion of the molten paraffine is poured out, the remainder adhering to the paper and to the upper edge of the casing and sulphur, care being taken that the coating *i* of paraffine extends over the edge of the casing. When the coating of paraffine has congealed the insulator is ready for being attached to the pole in the position seen in Fig. 1.

Although sulphur affords an excellent medium for securing the wire-holder to the glass and the latter to the exterior casing of the insulator, and although when dry it is a comparatively good non-conductor of electricity, it has a great affinity for water, with which, during rains or fogs, it soon becomes charged to such an extent as to neutralize its non-conducting properties; hence during rainy weather electric currents would pass from the edge of the casing to the wire-holder and through the paper were it not for the paraffine, which penetrates the sulphur and paper, adheres to the surface of the same, and effectually prevents these materials from absorbing moisture, while the surface of the paraffine is much less liable to become coated with moisture than the surface of glass, sulphur, or other materials. The stem of the wire-holder is also coated with paraffine, and when paraffine of the best quality cannot be obtained, and is consequently liable to melt at a low temperature, it may be protected by a coating of varnish applied to the surface.

I claim as my invention and desire to secure by Letters Patent—

1. The use, in the manner described, of a hollow cylinder, *h*, of paper or its equivalent, in connecting the glass block B to the casing A by means of sulphur.

2. The use of the paraffine as an insulating medium in telegraphic-wire insulators, in the manner described, or in any other manner by which the same result is attained.

3. The use, in connection with telegraph-wire insulators, of sulphur or other porous cement saturated with paraffine.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

DAVID BROOKS.

Witnesses :

CHARLES E. FOSTER,
W. J. R. DELANEY.