

C. F. VARLEY.
Telegraph Insulators.

No. 76,358.

Patented April 7, 1868.

Fig. 5.

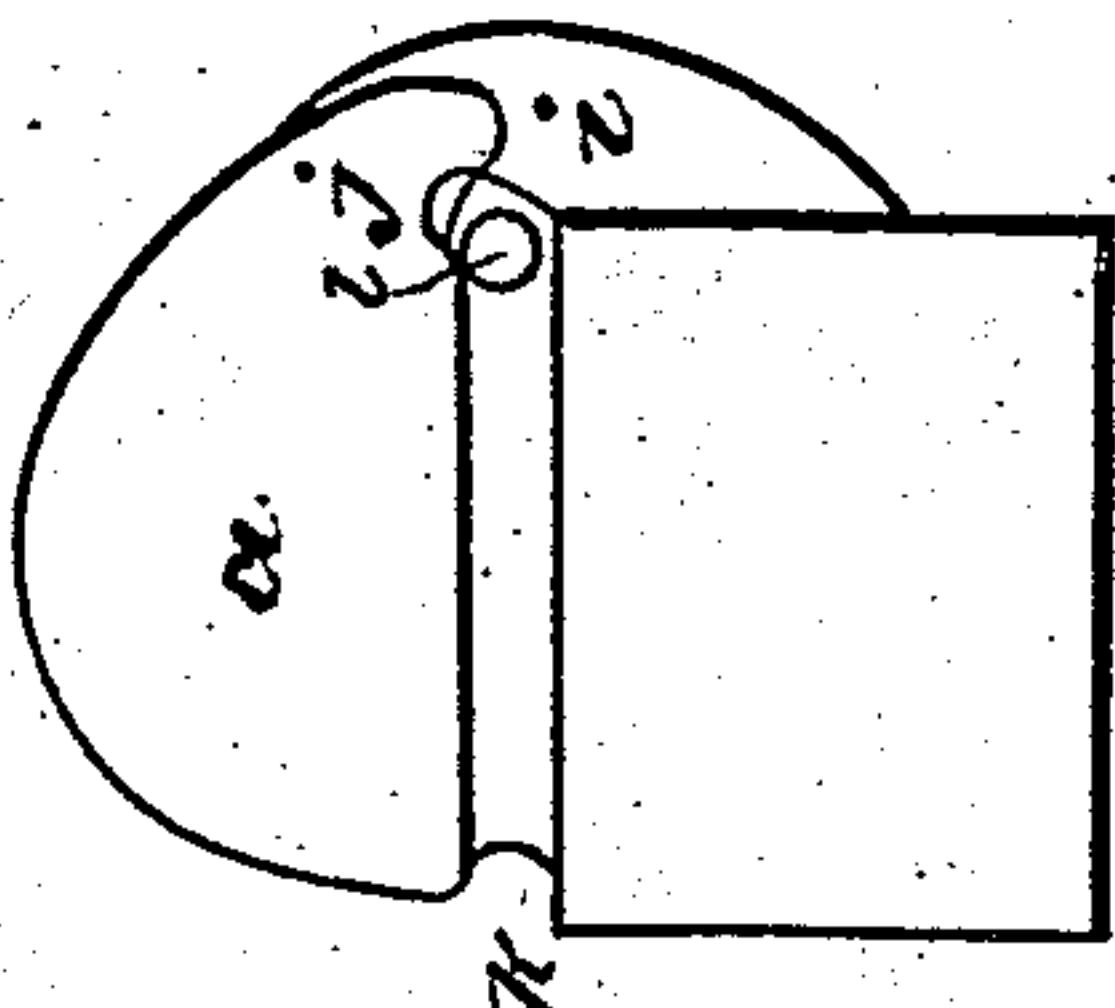


Fig. 6.

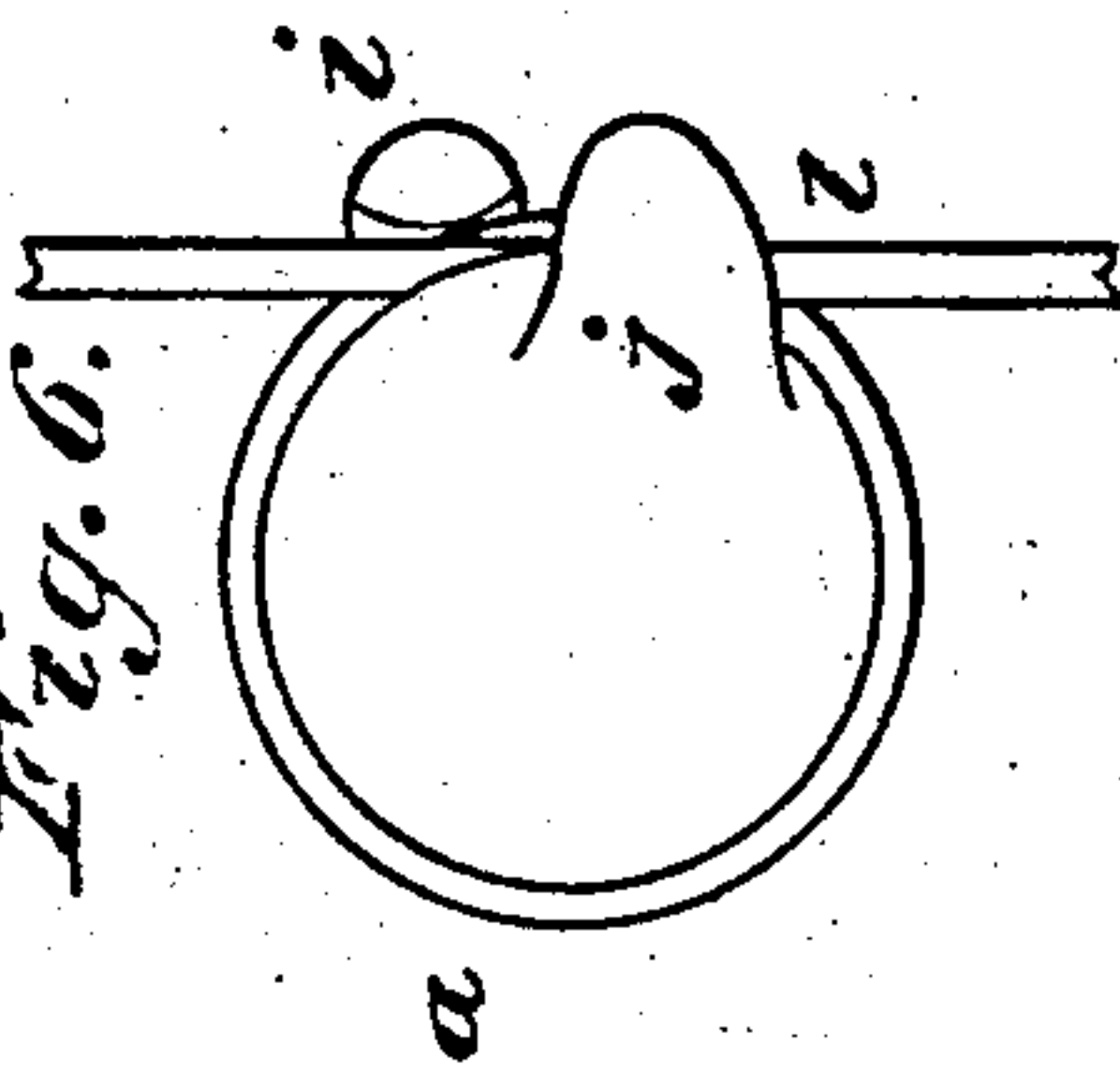


Fig. 4.

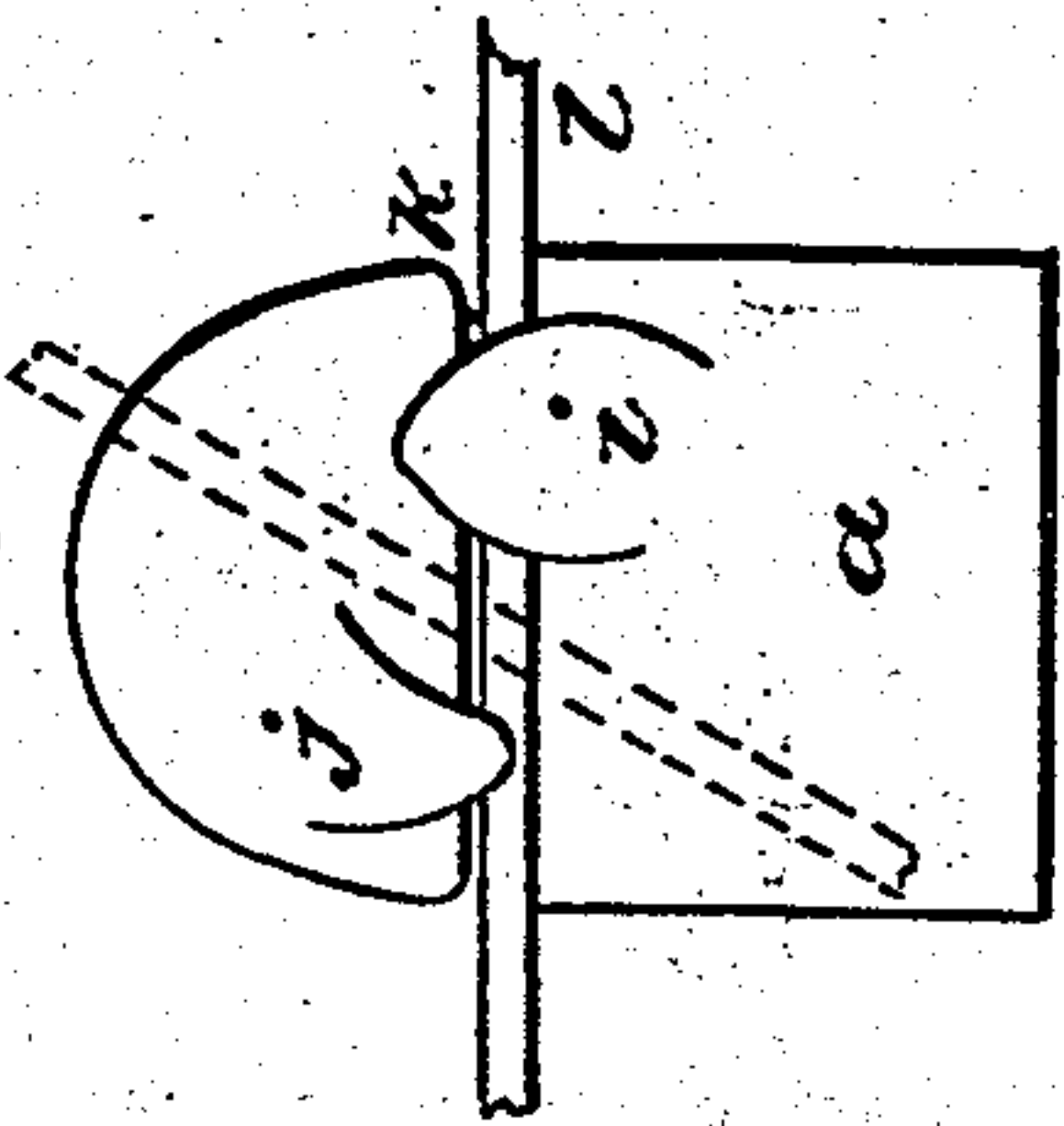


Fig. 7.

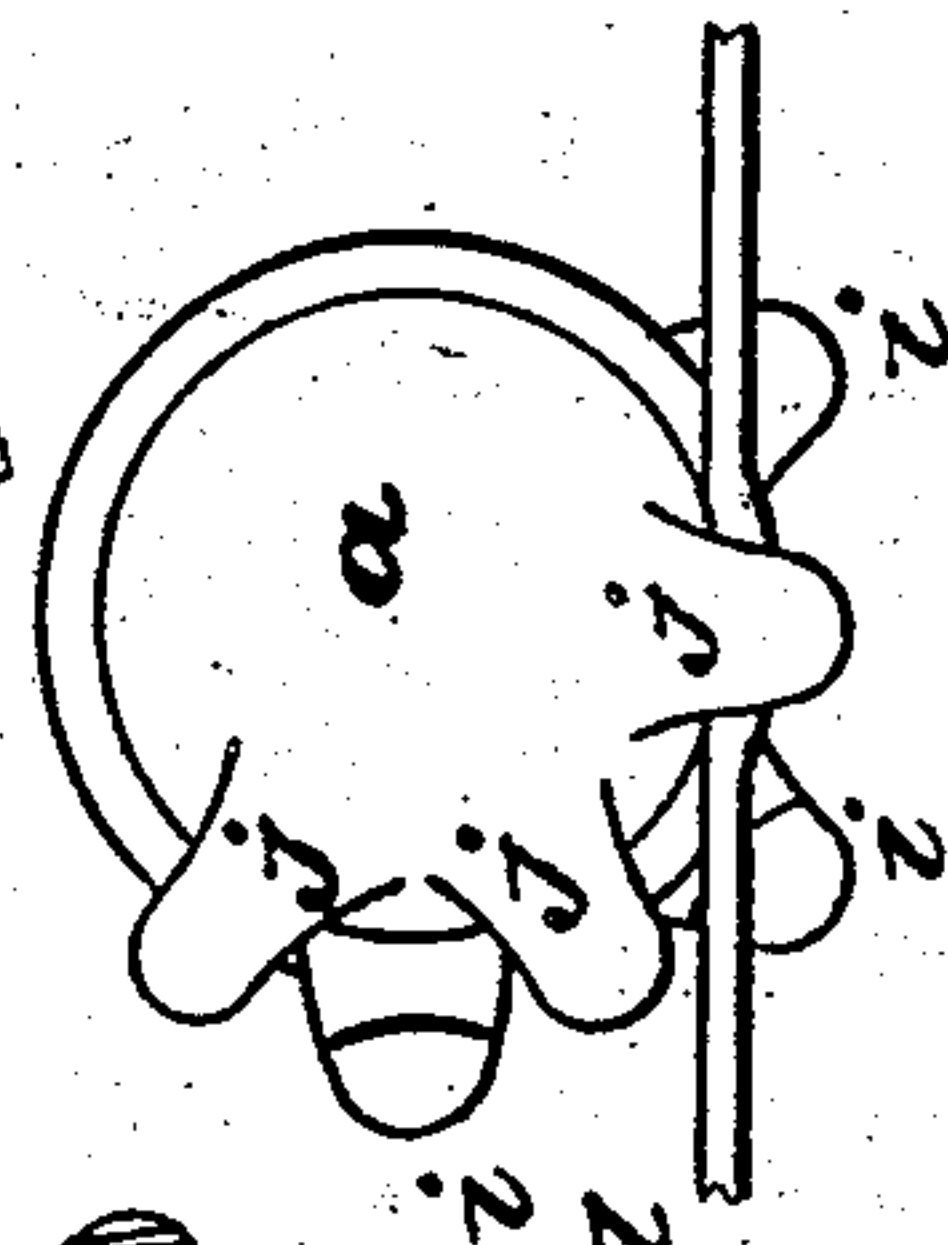


Fig. 3.

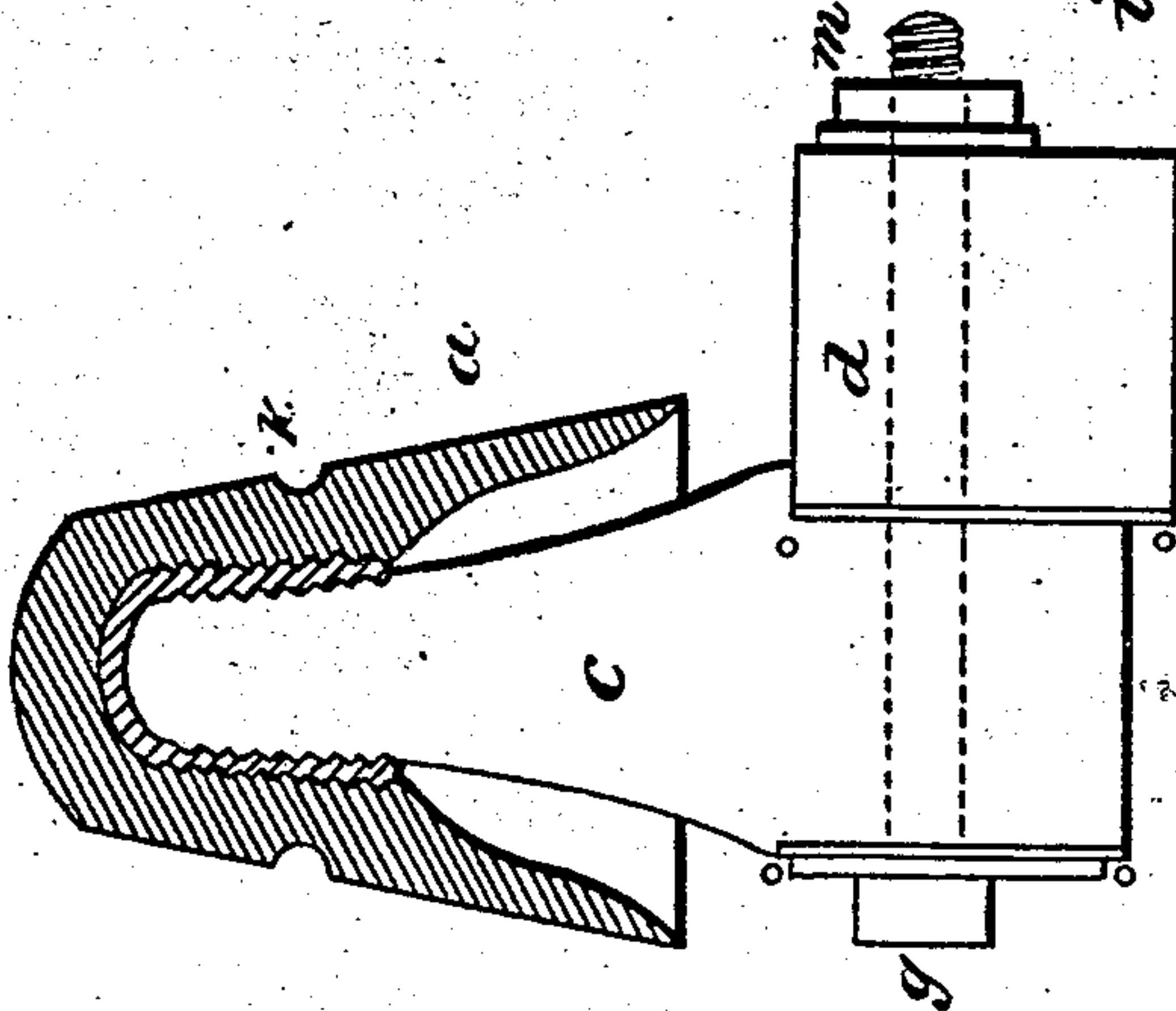


Fig. 2.

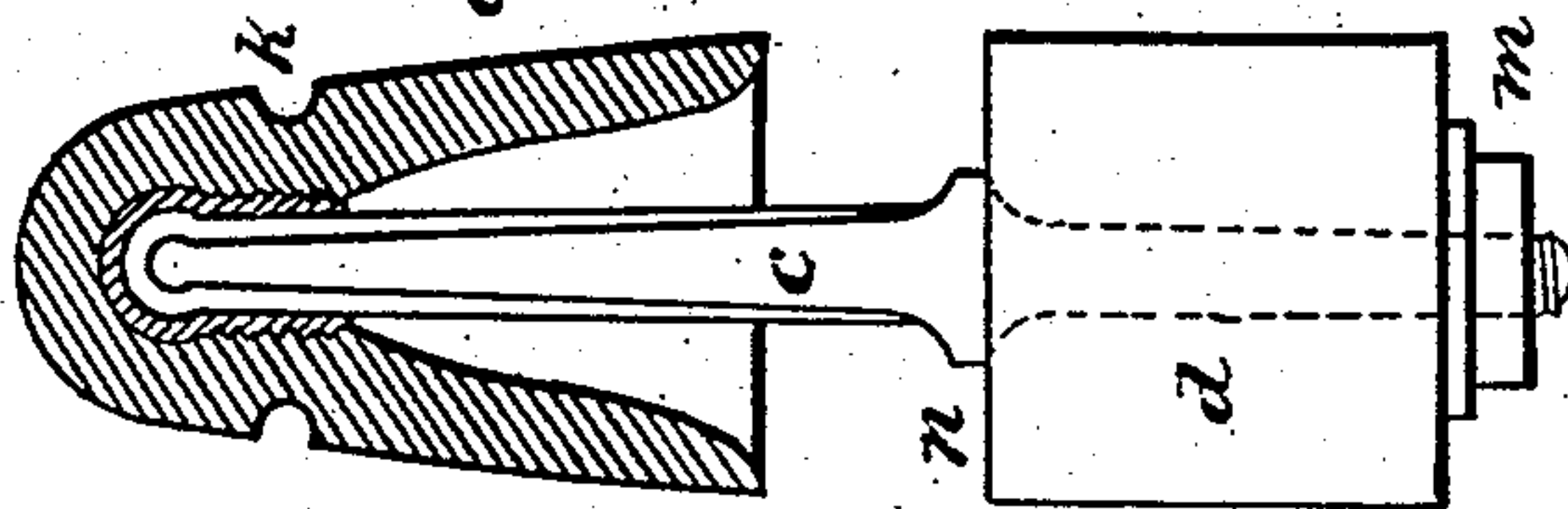
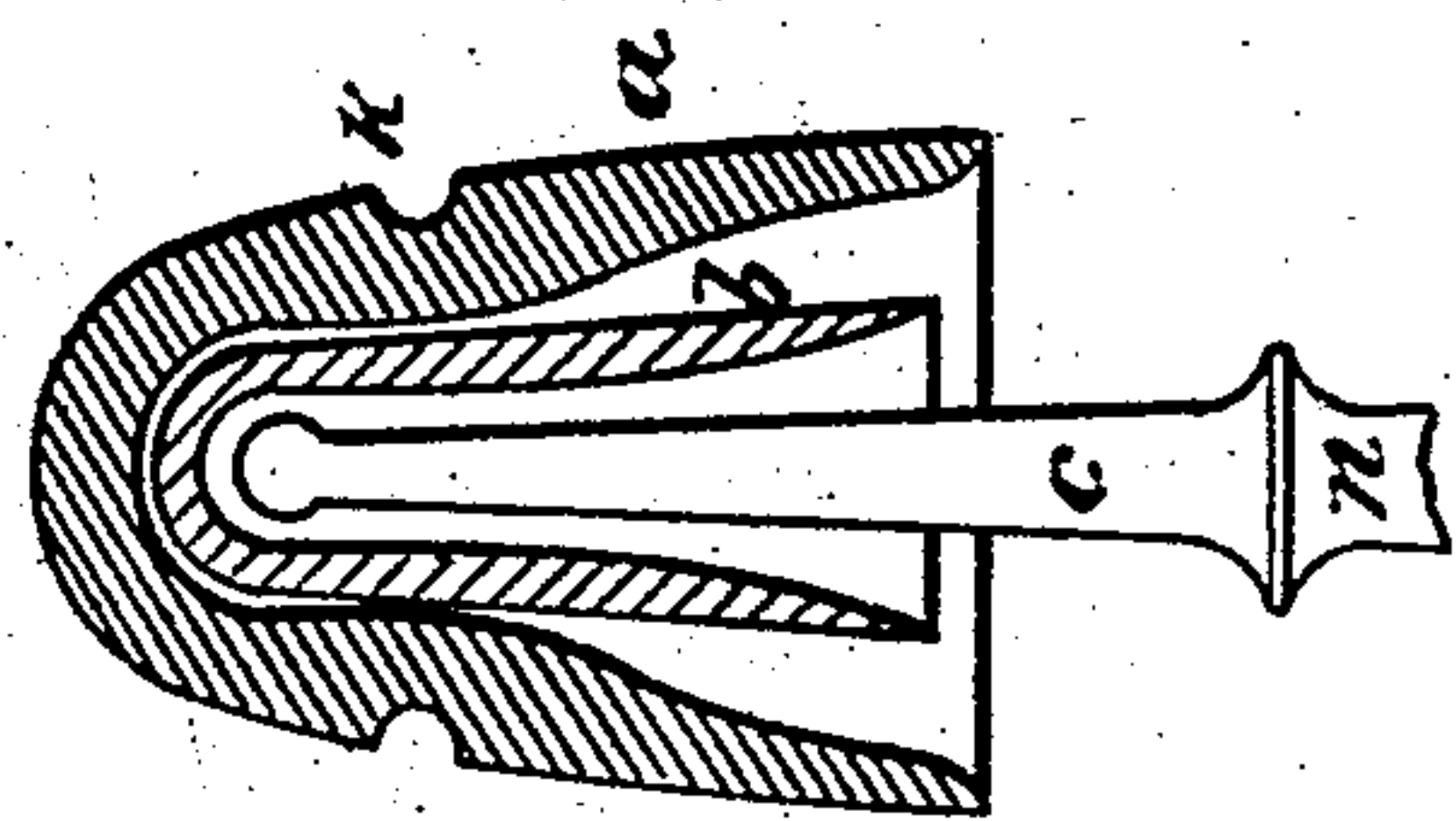


Fig. 1.



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CROMWELL FLEETWOOD VARLEY, OF NEW YORK, N. Y.

Letters Patent No. 76,358, dated April 7, 1868.

IMPROVEMENT IN ELECTRIC 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, CROMWELL FLEETWOOD VARLEY, a British subject, but now residing in the city, county, and State of New York, have invented certain new and useful Improvements in Insulators for Electric Telegraphs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

The first part of my said invention relates to a method of rendering insulators for telegraphic wires more perfect and reliable than as constructed prior to my said invention; and this part of my said invention consists in constructing them of two or more insulating portions, one within the other, so that if one should fail the other or others may prevent the escape or leak.

The modes of construction which I prefer for this part of my said invention will be seen in Figures 1, 2, and 3 of the accompanying drawings, which are vertical sections, and in these drawings, *a* represents the cap, made of porcelain, earthenware, or glass, or other non-conducting substance, and with a groove, *k*, in the periphery to receive the telegraphic wire. It is hollow to receive an inner or second insulator, *b*, which I prefer to make of vulcanite or hard India rubber, formed directly on the pin *c*, or secured thereto by means of interposed plaster of Paris or equivalent cement, and then this inner insulator so secured to the pin, is secured to the inside of the cap in like manner by cement. The pin is properly formed at the other end with a shoulder and stem, *n*, so that it can be secured to one of the arms *d* of a telegraph-post by a nut, *m*. But instead of the above mode of construction, the pin *c* may be made of porcelain, earthenware, or glass, of the form represented in fig. 3, and secured to the inside of the cap *a*, and with the lower end flat, and with a shoulder, that it may rest against and on the arm, *d*, of the pole, to which it can be secured by a screw-bolt, *g*, and nut *m*.

The second part of my said invention relates to a method of rendering the caps of insulators, when made of porcelain or other earthenware, less liable to discharge currents of electricity by moisture, whilst at the same time their non-conducting property can be successfully tested; and this part of my invention consists in glazing, by any of the known modes of glazing, such material, the outside and inside of the cap; on the outside from the upper part of the groove for the reception of the wire, and inside downwards from the part which is to be secured by cement to the inner insulator, and leaving the upper part unglazed. The glazing of the surface materially reduces capillary attraction, and in consequence, moisture will run off instead of remaining on the surface, as it would if unglazed, and the presence of moisture on the part above the wire will produce no evil consequences, but if the upper surface were also glazed, it would prevent the proper test from being applied. The usual mode of testing such caps before they are secured to the pins is to partly fill them with dilute sulphuric acid, and place them in an inverted position in a shallow vessel containing the above solution of acid, and after soaking for some hours, apply an electric current, and if any pass through, the cap must be rejected as being unsound. If the whole surface were glazed, the glazing alone would prevent the passage of the current even if the body were unsound, and as the glazing on the upper portion would soon crack by the action of the elements, the defects in the body not discovered by the test would soon render the insulator imperfect; but by my said improvement I am enabled to apply the test effectually, whilst at the same time the advantages of glazing the surface are obtained as effectually as if the whole surface were glazed.

The third part of my said invention consists in making the lower outer edge of the insulator sharp, but on the inside rounded, as represented in figs. 1, 2, and 3 of the accompanying drawings. This form prevents in a great measure the drops of rain, when blown inward, from breaking into spray and moistening the inside of the insulator. As the rain runs down the outer surface, it reaches the lower edge in drops. The majority of these drops of rain are carried around the rim of the insulator until they reach the leeward side of it, and there they break off at the sharp edge, and are blown away from, not into, the insulator.

And the last part of my said invention consists in making porcelain or earthenware insulator-caps with projecting ears above and below the groove for the reception of the wire, the more effectually to hold the wires in place. This part of my invention is represented in Figures 4, 5, 6, and 7 of the accompanying drawings, figs. 4 and 5 being elevations, and figs. 6 and 7 plan views. And in the said figures, *a* represents the cap, *i* the lower, and *j* the upper ears, and *l* the wire between the ears, and in the groove *k*. From the foregoing it will be seen that after the wire has been inserted, it is effectually held in the groove *k* by the two ears which are

above and below it, and which extend outside of it, and as the two ears are not in the same vertical plane, but one is some distance from the other, by inclining the wire as represented by dotted lines in fig. 4, or inclining the cap so as to be at a like angle with the wire, so that the wire will enter between the two ears, and then turning the wire or the cap to the position represented by the full lines in the said figure, the wire becomes completely embraced by the two ears, so that it cannot be gotten out.

In the above specification the cement used for uniting the caps together is not considered as an insulator, because in practice it is rarely found to be such. Sulphur should be carefully avoided in insulators, because it is very liable to expand in time and burst the insulator. It invariably cracks upon cooling, and admits moisture, and therefore it cannot be used as an insulator *per se*.

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

1. Making insulators for telegraph-wires of two or more insulating caps, exclusive of the cement which unites them, each cap being a complete insulator in itself, so that if one of the caps be defective, the other or others shall arrest the electric current, as set forth.

2. The use of a non-conducting pin inside an insulating cap, such pin being constructed of iron or steel covered with hard rubber, or being formed of stoneware or porcelain, substantially as described.

3. Glazing the lower part of porcelain or stoneware or earthenware caps, and leaving the upper part unglazed, substantially as and for the purposes set forth.

4. Making the lower edge of the insulator-cap externally sharp, but internally rounded, so that drops of rain, when blown outwards, shall fall off, and when blown inward shall not break off, but run, by capillary attraction, up the rounded surface out of the wind, substantially as set forth.

5. Making porcelain or stoneware or earthenware caps with two or more projecting ears, in combination with and arranged above and below the groove for the wire, so that when the insulator is inclined to the wire, the latter can be inserted, but when at right angles to it, the latter cannot be gotten out, as set forth.

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Witnesses.

WM. H. BISHOP.

A. DE LACY.