

No. 816,981.

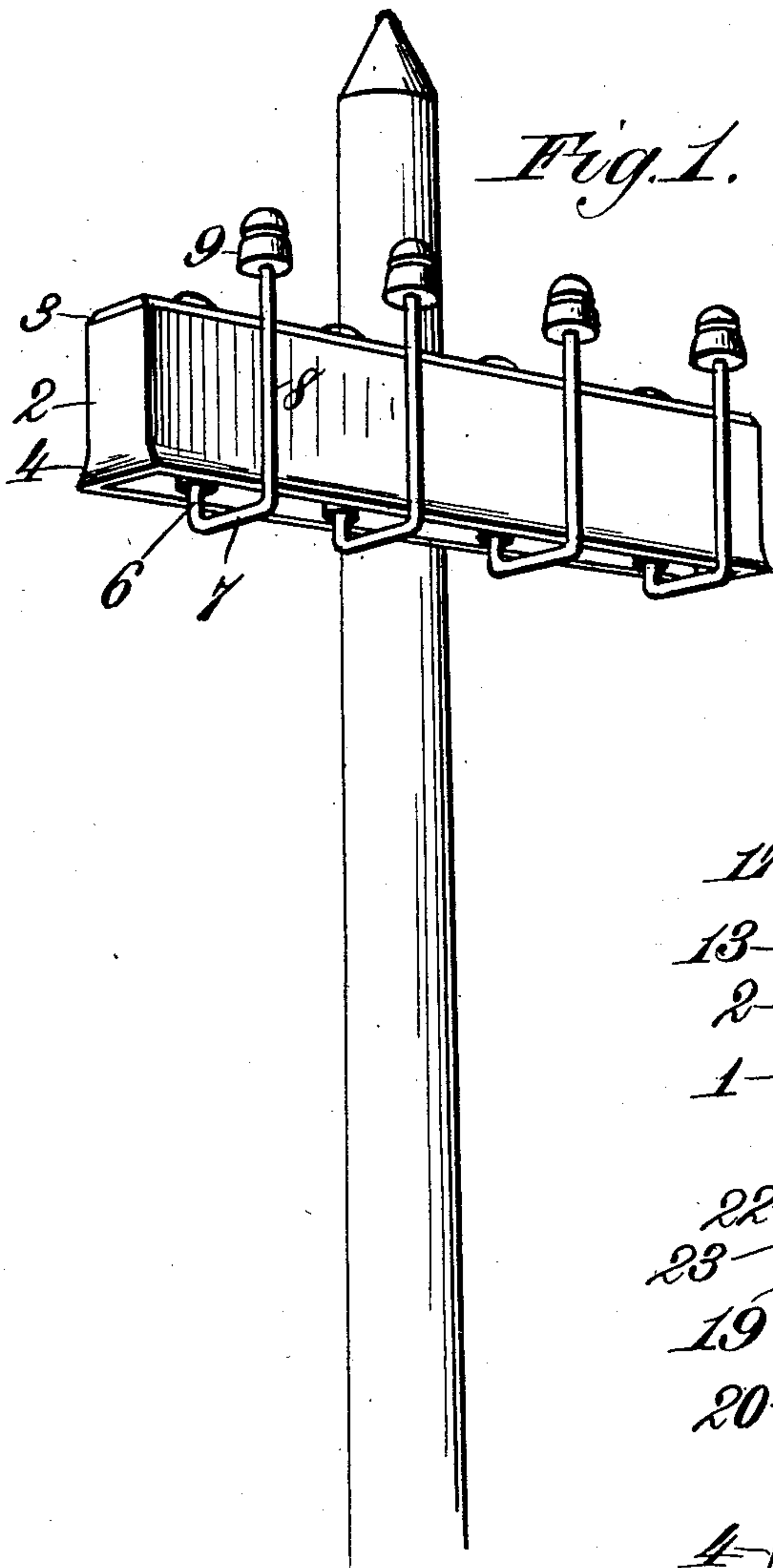
PATENTED APR. 3, 1906.

A. H. ILIOHAN.

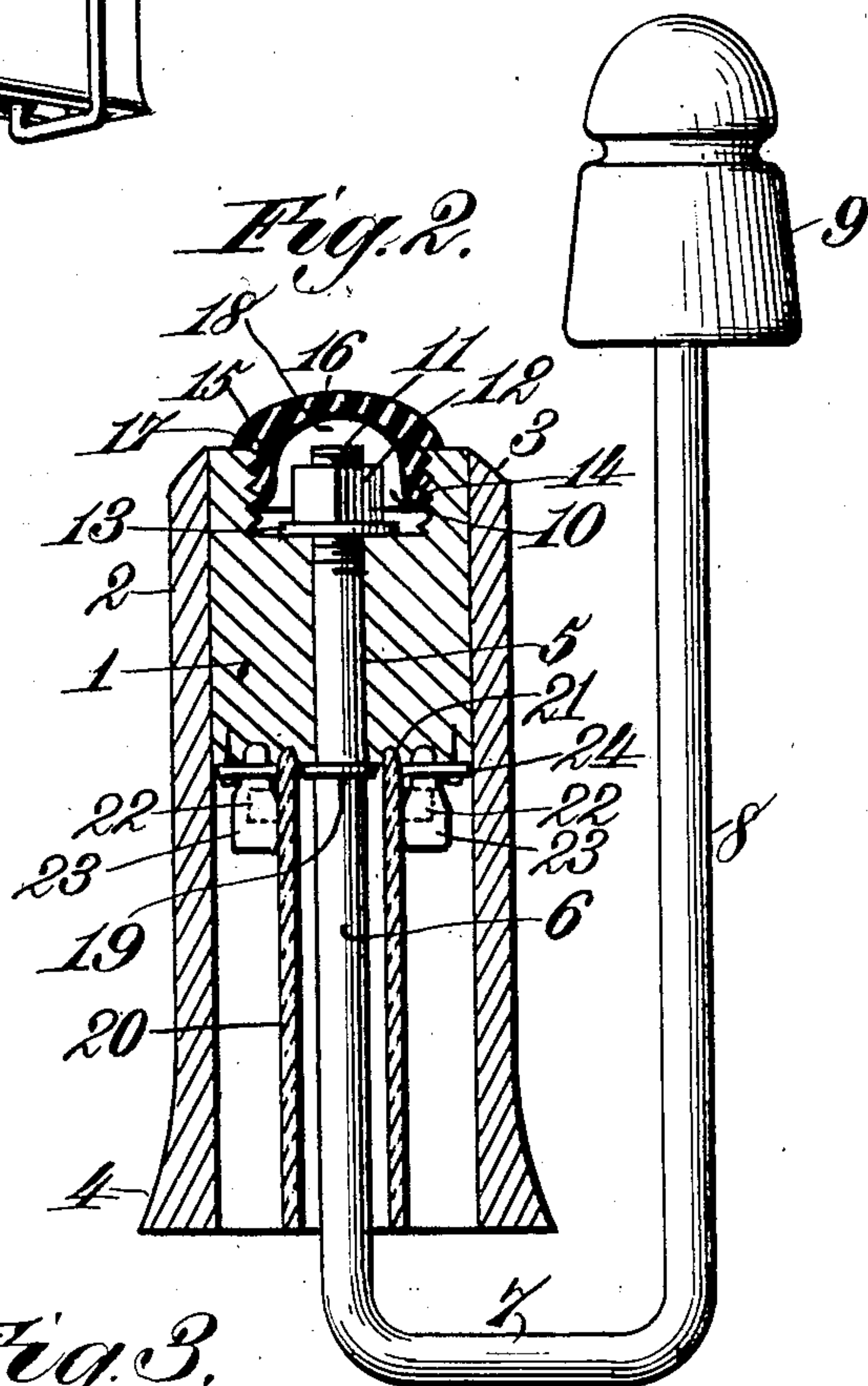
CROSS ARM FOR ELECTRIC OR SIGNAL WIRES.

APPLICATION FILED MAR. 21, 1905.

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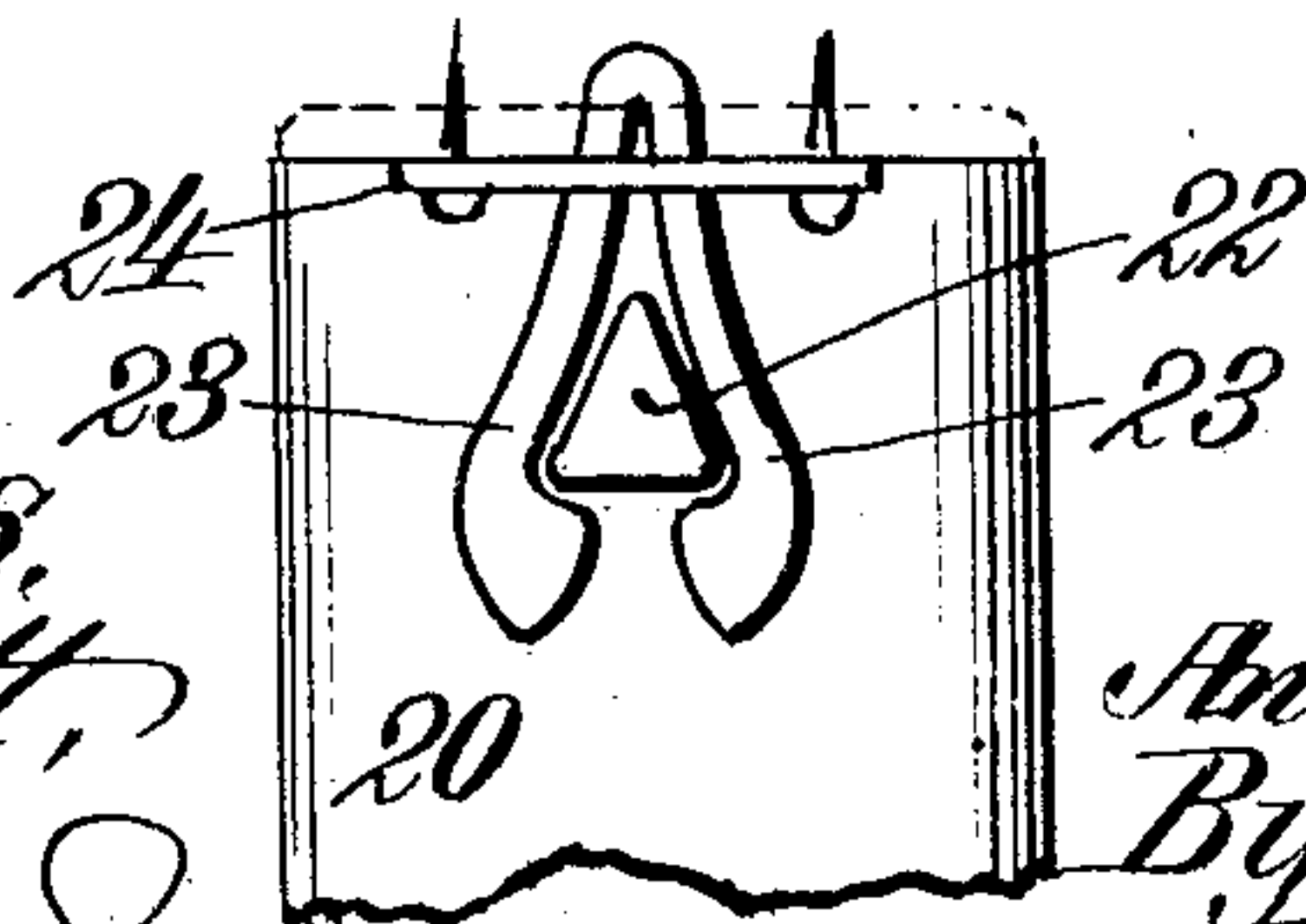


*Fig. 1.*



*Fig. 2.*

*Fig. 3.*



Witnesses,  
Robert Everett,  
James L. Morris, Jr.

Inventor,  
Anthony H. Iliohan.  
By James L. Morris, Jr.  
Att'y.

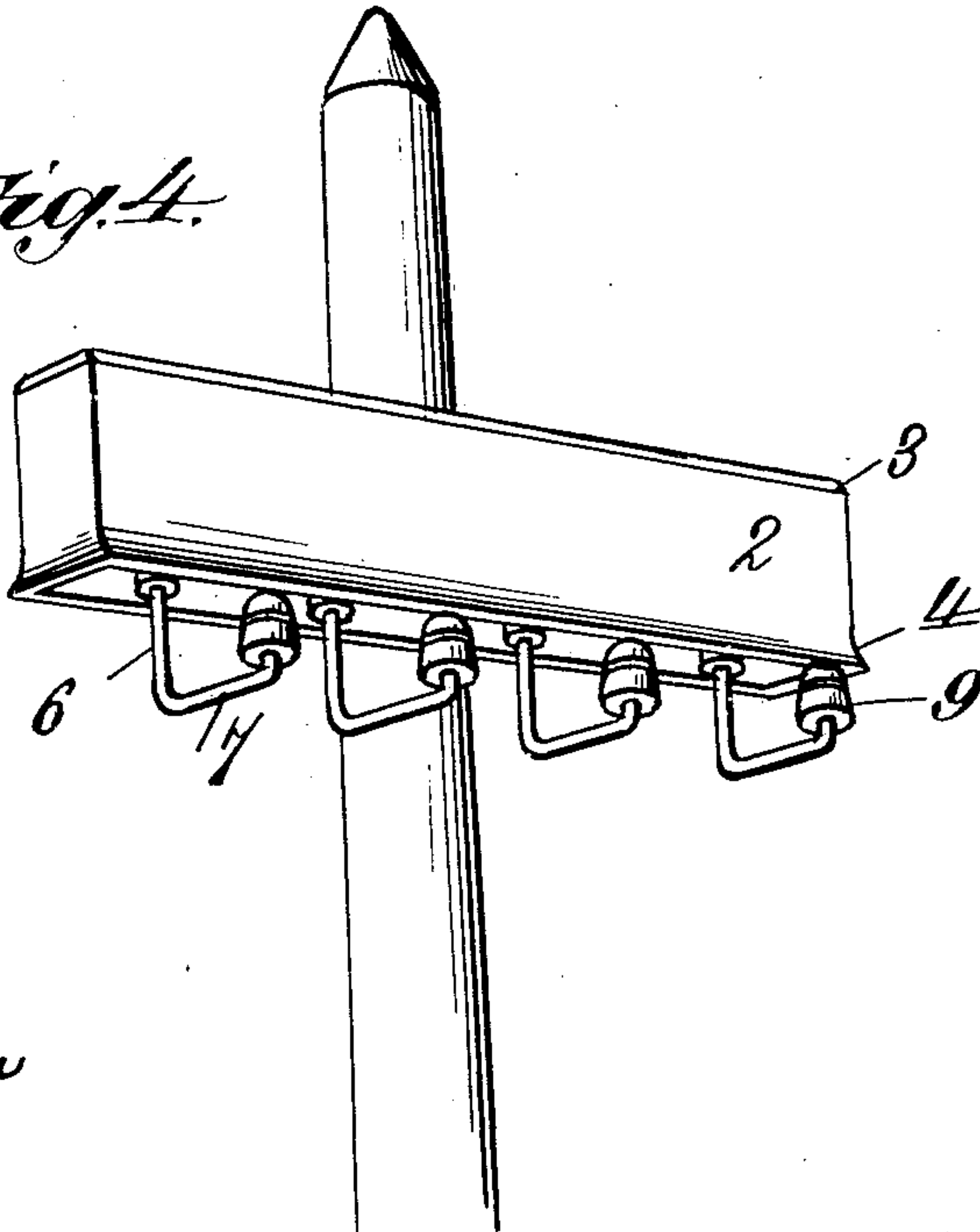
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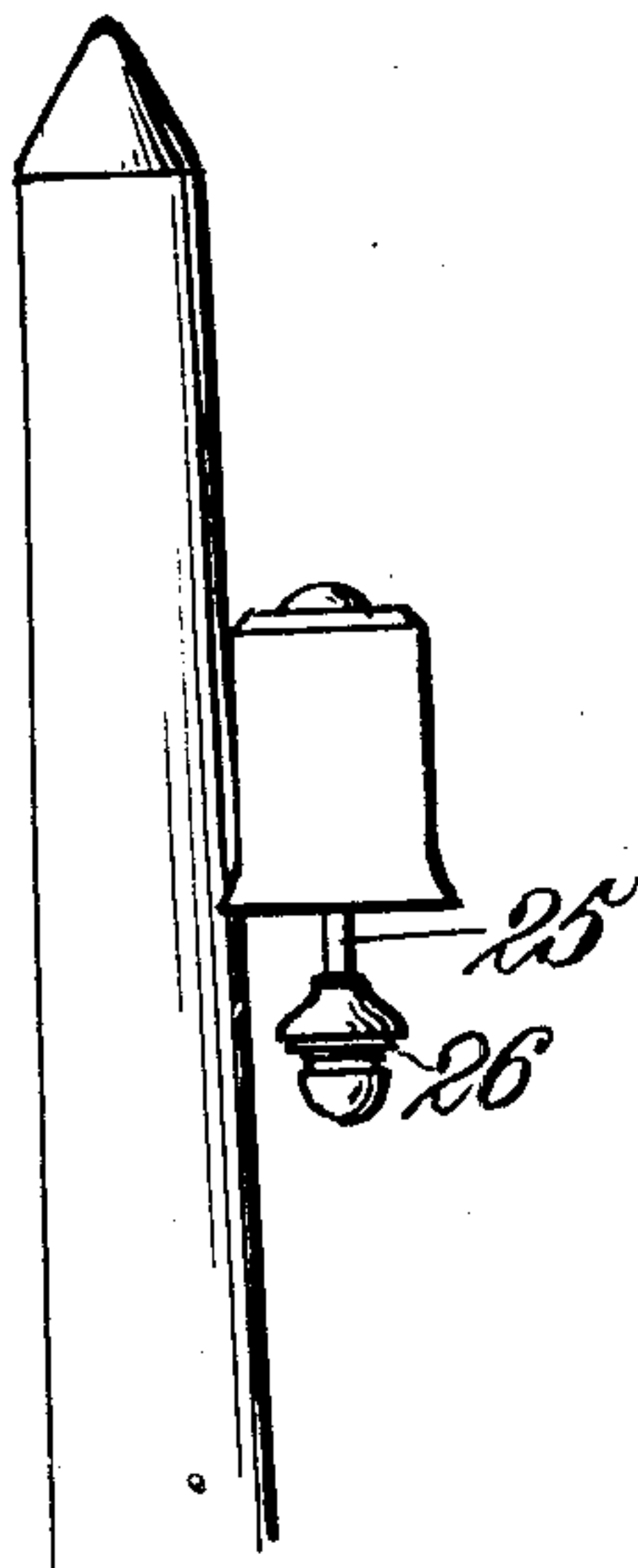
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CROSS ARM FOR ELECTRIC OR SIGNAL WIRES.  
APPLICATION FILED MAR. 21, 1905.

2 SHEETS—SHEET 2.

*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

ANTHONY H. ILIOHAN, OF OAKLAND, CALIFORNIA.

## CROSS-ARM FOR ELECTRIC OR SIGNAL WIRES.

No. 816,981.

Specification of Letters Patent.

Application filed March 21, 1905. Serial No. 251,332.

Patented April 3, 1906.

*To all whom it may concern:*

Be it known that I, ANTHONY H. ILIOHAN, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Cross - Arms for Electric or Signal Wires, of which the following is a specification.

This invention relates to a cross-arm for telephone and telegraph poles, or it may serve as a means for holding wires at any other points where it may be found applicable.

The purpose of the present cross-arm is to overcome "weather" or "surface cross" on wires carrying an electrical current, and is more particularly intended to prevent the signals on a telephone or telegraph wire meeting with interference by being crossed with another circuit on the same pole during rainy or foggy weather.

The cross-arm essentially consists of a piece of timber or other suitable material having a protective covering depending therebelow in the form of a skirt and surrounding the sides and ends and carrying one or more pins which depend therefrom and project upwardly above the arm proper at a distance from the side of the latter and have terminally fixed thereto a corresponding number of ordinary glass, porcelain, or other preferred insulators. The pin or insulator support is headed in the body of the arm and capped by an insulating means located on the top of said body to prevent moisture from coming in contact with the upper extremity of the pin or insulator support and also to preserve the wood or other material of which the body of the arm is constructed. As a further effective auxiliary the part of the pin passing downwardly from the body of the arm within the surrounding skirt is protected by an insulating-tube, preferably of glass, having an interior diameter greater than that of the pin and terminating coincidentally with the lower end of the skirt. This means for protecting the pin, bolt, or support for the insulator with respect to the body of the arm and also shielding the arm by a skirt surrounding the same and depending therebelow has the advantageous effect of obstructing conveyance of the current from one insulator down the dust, dirt, or moisture covered pin or bolt to the cross-arm, and thence to the next pin or bolt and

connecting-wire, and so on through the whole series. The several parts may be readily disposed in operative position or associated by a lineman, and the proportions, dimensions, and minor details may be varied to compensate for various applications and uses. It is also intended to vary the materials in the construction of the several parts, and in the use of the particularly - applied insulating devices it will be understood that glass, porcelain, wood, or composite substances may be employed.

In the drawings, Figure 1 is a perspective view of a part of a pole, showing the improved cross-arm applied thereto. Fig. 2 is an enlarged transverse vertical section through the cross-arm, taken in the plane of location of one of the pins, bolts, or insulator-supports. Fig. 3 is a detail elevation of one of the locking organizations for a part of the insulating and protecting means. Fig. 4 is a detail perspective view of a portion of a pole and the improved cross-arm, showing a slight modification in the position of the insulators. Fig. 5 is an elevation of a portion of the pole and cross-arm, showing a further modification in the position of the insulators.

Similar numerals indicate corresponding parts in the different views.

Referring to Figs. 1, 2, and 3, the numeral 1 designates the body of the arm, which can be of any suitable length and thickness and constructed from any preferred material, wood being well adapted for ordinary purposes. Covering-strips 2, also of wood or other material, are applied to the sides and ends of the body 1 and depend below the latter a suitable distance to form a skirt, said strips extending fully over the sides and ends of the body from the upper edge of the latter, and the upper terminals of the strips are beveled downwardly, as at 3, to insure a flow or ready escape therefrom of any moisture that may settle on the top of the arm as an entirety. Any moisture that flows downwardly over the outer surface of the strips is deflected off from the lower terminal of the skirt by outwardly-inclined lower surfaces 4, which are provided by thickening the said lower terminal of the skirt or the strips composing the latter. This thickening of the lower terminal of the skirt also strengthens the same and tends to keep the entire skirt in proper normal shape. The body 1 has one or more vertical pins or bolt openings or holes



5 extending therethrough, the arm being shown equipped in the present instance with four insulators and as many pins, bolts, or supports 6, which extend through the said openings 5. The number of the pins, bolts, or supports 6 is not essential, however, and in lieu of the ordinary short pin for supporting the insulators each pin or bolt in the present instance is of considerable length and depends below the lower terminal of the skirt 2 and is deflected to one side by a bend or elbow 7 and continued upwardly in a vertical member 8 above the top of the body 1 to receive a porcelain, glass, or other insulator 9, of usual construction. Each pin or bolt 6 has considerable bearing or extent within the body 1 to strengthen the entire structure, and around the upper terminal of each opening or hole 5 a nut-cavity 10 is formed in the body, into which the upper screw-threaded end 11 of the pin or bolt projects to receive a nut 12, cooperating with a washer 13, bearing on the floor of the cavity. The wall of the cavity is screw-threaded, as at 14, to receive the depending screw-threaded member 15 of a cap 16, the cap also having a circumferential shoulder 17 to snugly bear on the upper side or edge of the body 1 around the cavity. The lower extremity of the member 15 does not contact with the floor of the cavity, and the cap has an inner central recess 18 of such dimensions as to fully inclose the nut without contacting with the latter or the pin or bolt extremity. The cap 16 is readily applicable to and removable from the cavity 10 and is composed of any suitable insulating material, and by the use of this cap the nut and bolt are completely shielded from the weather and rendered more durable, and moisture is thereby prevented from running down over the bolt and permeating the body 1. Dirt and dust are also prevented by this cap from collecting around the upper end of the pin or bolt. To facilitate the application of the nut 12 to the upper screw-threaded extremity 11 of the pin or bolt 6, the latter has a collar or stop projection 19 surrounding the same at a suitable distance from its screw-threaded extremity 11 and adapted to bear against the under side of the body 1. This collar or stop projection 19 also assists in the accurate assemblage of the pin or bolt with respect to the body 1. The cross-arm as thus far described can at times be used without any other protective auxiliary; but to render the cross-arm organization more positive in preventing surface cross with respect to the several wires that may be carried thereby and connected to the insulators supported on the pins or bolts an elongated insulating-sleeve or tubular inclosing device 20 is removably attached to the under side of the body 1 in concentric relation to and around the portion of each pin or bolt within the skirt 2, the inner diameter of the sleeve or

tubular inclosure being such as to clear the pin or bolt. The sleeve or tubular inclosure 20 may be of any thickness and preferably terminates at its lower end coincidentally with the lower end of the skirt and is thus shielded by the latter. The upper end of the sleeve or tubular inclosure is let into a groove 21 in the under side of the body 1 and surrounding the lower terminal of each opening or hole 5. The upper end of the sleeve or tubular inclosure is formed with diametrically-opposed supporting projections 22, which are preferably diamond-shape and removably engage inwardly-facing oppositely-disposed spring-catches or yielding locks 23 clearly shown by Fig. 3 and depending from plates 24, secured to the under side of the body 1, close to the point where the upper end of the sleeve or tubular inclosure engages the groove 21. The spring-catches or yielding locks 23 each have a pair of jaws separated at their lower extremities to permit the supporting projections 22 to be pushed upwardly therebetween in applying the sleeve or tubular inclosure to the body 1. By means of these spring-catches or yielding locks and the disposition of the upper terminal of the sleeve or tubular inclosure in the groove 21 said sleeve or inclosure is reliably held in firm engagement with the body 1, though capable of being detached at any time desired. It will also be seen that each of the pins or bolts will be provided with a double protection around the portion thereof depending below the under side of the body 1 of the skirt 2 and the sleeve or tubular inclosure 20, and in assembling the pins or bolts in the body 1 the screw-threaded extremities 11 thereof can be readily pushed upwardly through the sleeve or tubular inclosure 20 and the openings or holes 5 to receive the nuts 12. After the nuts are applied the caps 16 are then placed in position, as shown.

In the modification shown by Fig. 4 the same reference numerals are applied as in the preceding figures, and the construction of the arm and pins or rods are duplicated, with the exception that the latter do not project above the cross-arm, but are curtailed and the insulators are positioned below the lower edge of the arm and projected laterally. In the modification shown by Fig. 5 the construction is also similar to that heretofore set forth by Figs. 1, 2, and 3 with respect to the cross-arms, and the pins 25 are straight and carry insulators 26 directly under the lower edge or bottom of the cross-arm. These modifications in the arrangement of the pins or rods are intended to indicate that the improved cross-arm may be employed with any form of pin or rod and that the insulator or insulators do not have to be located in any precise manner to render the arm effective.

From the foregoing description it will be observed that moisture is prevented from



coming in contact with the pins or bolts at any point near the cross-arm body.

Having thus described the invention, what is claimed as new is—

1. In a cross-arm for the purpose set forth, a body, a continuous pin having one extremity removably secured in the body and depending below the latter to one side and above the same and having an insulator on its free terminal, the secured end of the pin in the body being accessible from the top of the latter and also withdrawable downwardly through the body, and an insulating-cap removably applied over the end of the pin secured in the body and accessible from the upper side of said body.

2. A cross-arm for the purpose set forth having a body with a protective covering surrounding the sides and ends of the same and depending therebelow to form a skirt, a pin having one terminal removably secured in the body and extending downwardly within the skirt and below the end of the latter and then upwardly above the body, and an insulator on the free terminal of the pin.

3. In a cross-arm for the purpose set forth, an insulating-body having cavities formed in the upper portion thereof and openings extending therethrough and communicating with the cavities, continuous pins having screw-threaded extremities projected upwardly through the openings into the cavities and removably secured to the body, the pins depending below the body and to one side of the latter and then vertically above said body, insulators on the free terminals of the pins above the body, securing devices applied to the extremities of the pins projecting into the cavities, and insulating-caps removably inserted in the cavities over the securing devices and the extremities of the pins engaging the body, said insulating-caps bearing on the upper edge of the body and rendering the securing means for the pins accessible.

4. In a cross-arm of the class set forth, an insulating-body, pins secured in and depending below and to one side of the body and having insulators on their free extremities, and tubular insulating-inclosures separably applied to the under side of the body around portions of the pins.

5. In a cross-arm of the class set forth, an insulating-body, pins secured in and depending below and to one side of the body and having insulators on their free extremities, and insulating-inclosures removably applied to the under side of the body around portions of the pins.

6. In a cross-arm of the class set forth, an insulating-body, pins secured in and depending below and to one side of the body and having insulators on its free extremities, and insulating-inclosures surrounding the portions of the pins depending from the body

and having projections at their terminals and spring locking devices with which the said projections removably engage.

7. In a cross-arm of the class set forth, an insulating-body, continuous pins secured in and depending below and to one side of the body and having insulators on their free extremities, insulating-inclosures removably surrounding portions of the pins depending below the body and having their upper terminals inserted in the body, the upper extremities of the inclosures having projections, and means with which said projections detachably engage.

8. In a cross-arm for the purpose set forth, the combination of a body having a protective covering surrounding the sides and ends of the same and depending therebelow in the form of a skirt, tubular insulating-inclosures applied to the under side of the body within the skirt, and continuous pins or bolts secured in the body and extending downwardly through the inclosures below the skirt and outwardly from the latter, the free terminals of the pins having insulators applied thereto.

9. In a cross-arm, an insulating-body, continuous pins or bolts secured in the said body and depending below the latter, the secured terminals of the pins or bolts being exposed at the upper side of the body, insulators on the free extremities of the pins or bolts, insulating-caps removably applied to the upper side of the body over the secured terminals of the pins or bolts, and tubular insulating-inclosures removably applied to the under side of the body around portions of the pins or bolts.

10. In a cross-arm, an insulating-body, pins or bolts secured in the said body and depending below the latter, the secured terminals of the pins or bolts being exposed at the upper side of the body, insulators on the free extremities of the pins or bolts, insulating-caps removably applied to the upper side of the body over the secured terminals of the pins or bolts, and a protective covering applied to the sides and ends of the body and extending below the latter in the form of a skirt.

11. In a cross-arm, an insulating-body having openings extending therethrough and cavities in the upper portion communicating with said openings, continuous pins or bolts inserted through the said openings and having stop means thereon to contact with the under side of the body, the pins or bolts being continued below the body and having insulators secured to their free terminals, the pins or bolts being placed in position and nuts applied in the cavities over the terminal portions of the pins or bolts engaging the body, insulating-inclosures removably surrounding the portions of the pins below the body, and protective insulating-caps applied



to the cavities over the nuts and adjacent ends of the pins or bolts.

12. In a cross-arm, an insulating-body having openings extending therethrough and a skirt depending from the sides and ends thereof, continuous pins or bolts inserted through the openings of the body from the under side of the latter, means for securing the pins or bolts in the body, the said pins or bolts projecting below the lower edge of the skirt and having insulators on their free ends, and insulating-inclosures removably applied around the portions of the pins within the skirt.

13. In a cross-arm, an insulating-body having openings therethrough, pins or bolts inserted in the said openings and depending below the body to receive insulators, spring lock devices secured in opposite positions against the under side of the body and having jaws separable at their lower extremities, and tubular insulating-inclosures surround-

ing portions of the pins or bolts extending below the body and provided with projections to removably enter between the said jaws and hold the inclosures in close relation to the under side of the body.

14. In a cross-arm of the class set forth, an insulating-body, pins secured in and depending below the body and having insulators on their free extremities, tubular insulating-inclosures removably applied to the under side of the body around portions of the pins, and a skirt depending from the body, the lower ends of the tubular inclosures terminating flush with the lower edge of the said skirt.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ANTHONY H. ILIOHAN.

Witnesses:

DANIEL M. CALNEN,  
ROBT. L. ELLZEY.