No. 855,355. PATENTED MAY 28, 1907.

L. STEINBERGER.

HIGH POTENTIAL INSULATOR.

APPLICATION FILED SEPT. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

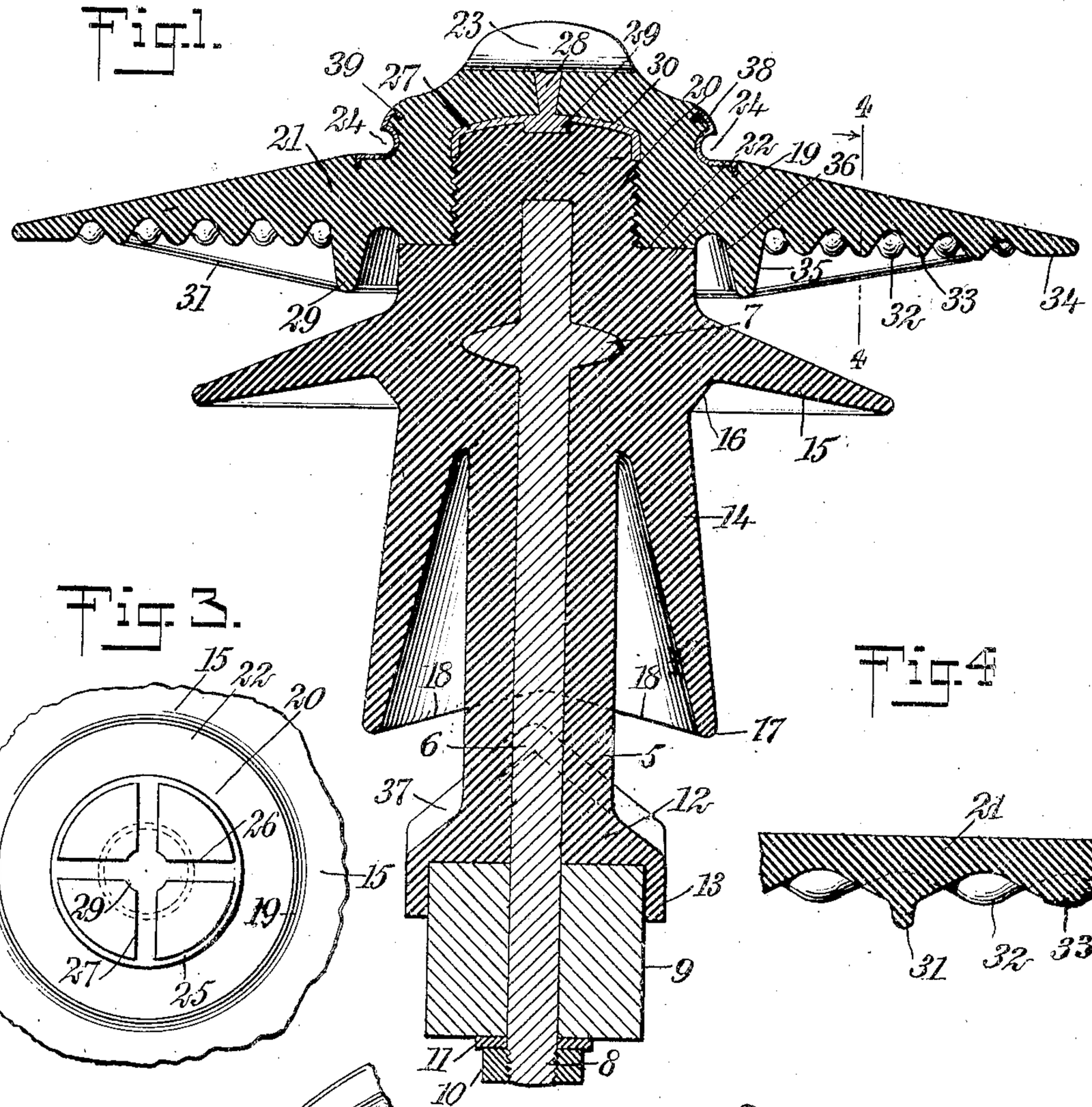
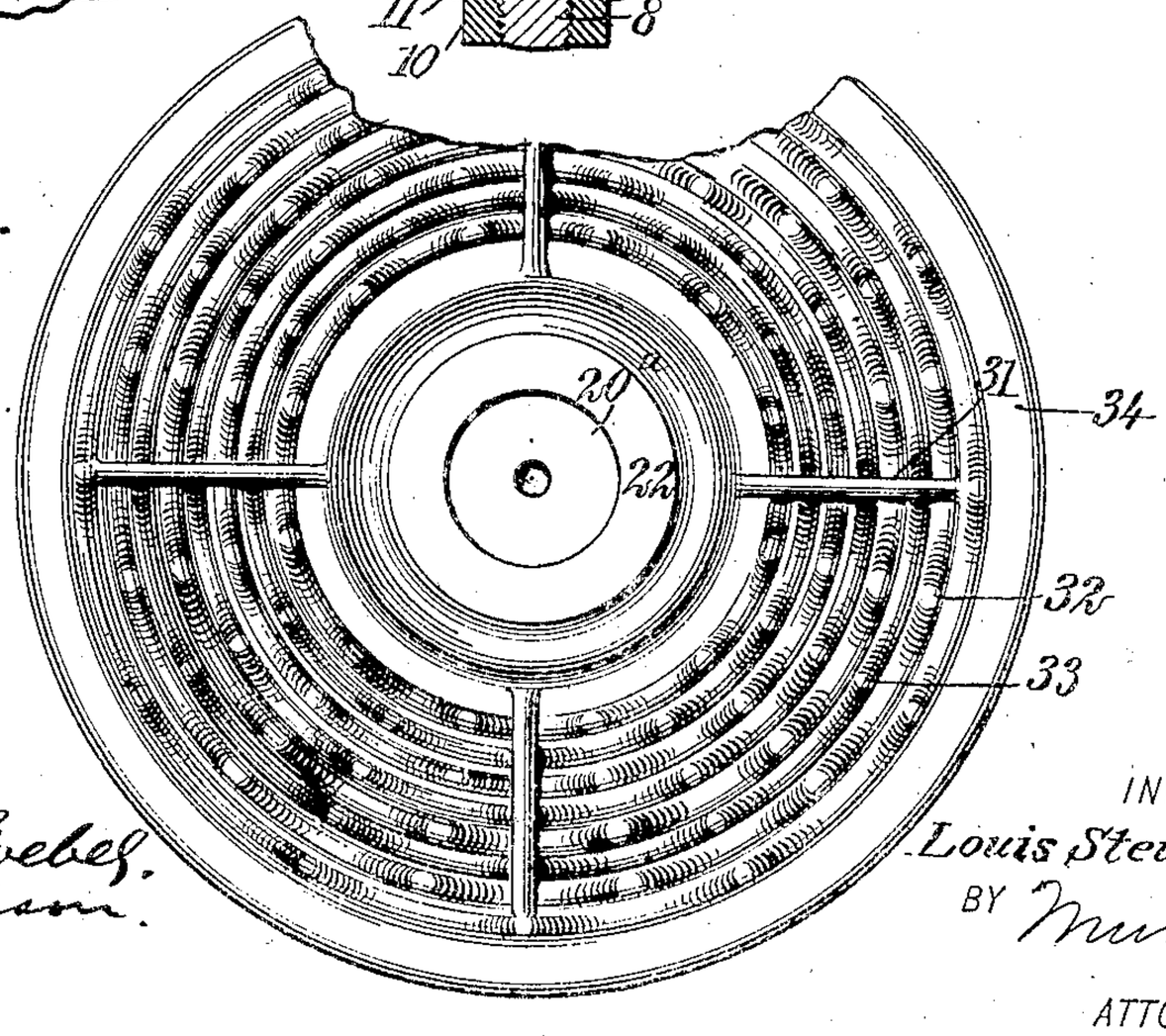


Fig. 3.

Fig. 4

Fig. 2.



WITNESSES

William P. Goebel.
Walton Harrison.

INVENTOR

Louis Steinberger

BY Munn & Co

ATTORNEYS

No. 855,355. PATENTED MAY 28, 1907.

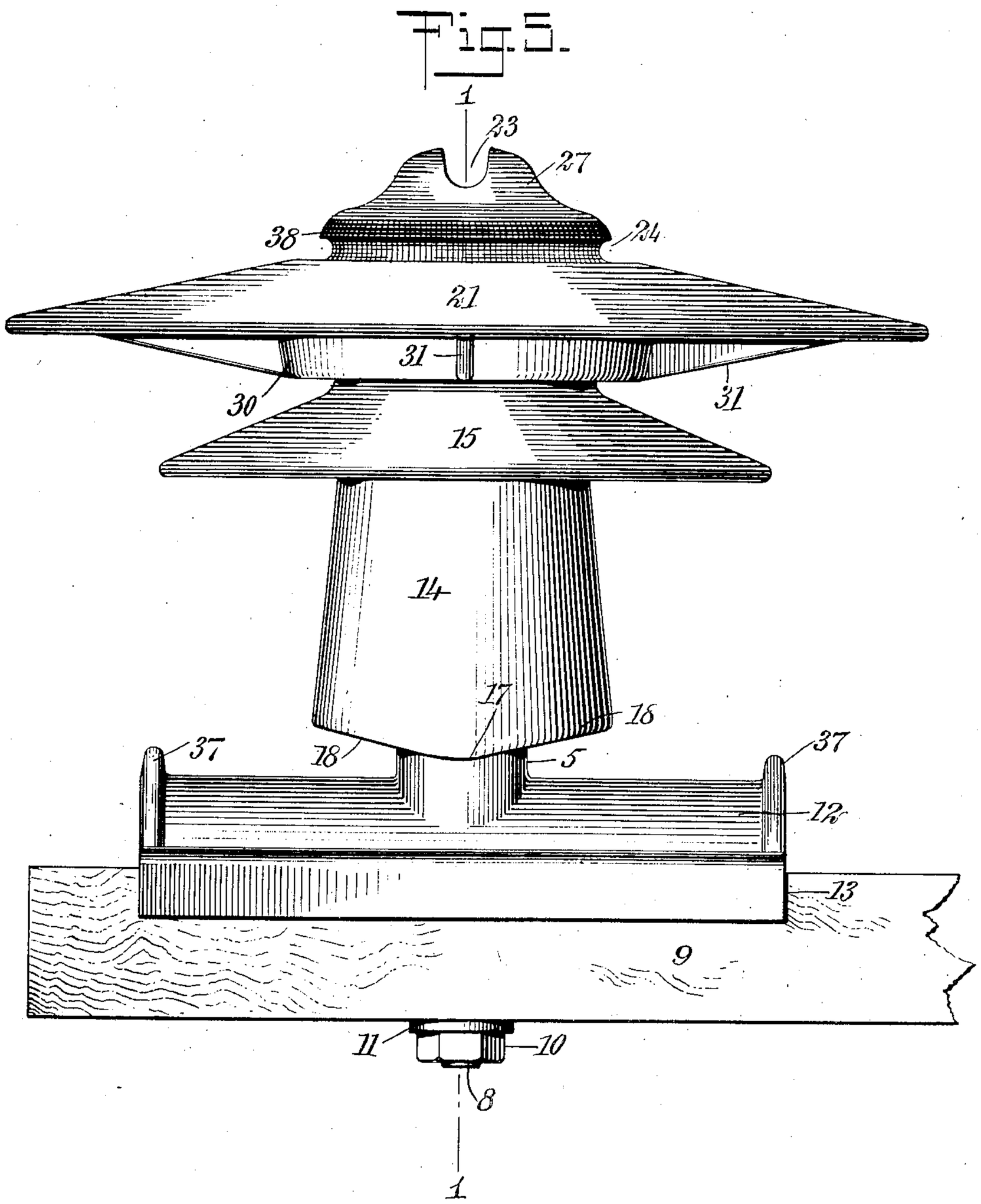
L. STEINBERGER.

HIGH POTENTIAL INSULATOR.

APPLICATION FILED SEPT. 12, 1906.

2 SHEETS—SHEET 2.

Fig. 5.



WITNESSES

William P. Goebel.

Walton Harrison

INVENTOR

Louis Steinberger.

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

LOUIS STEINBERGER, OF NEW YORK, N. Y.

HIGH-POTENTIAL INSULATOR.

No. 855,355. Specification of Letters Patent. Patented May 28, 1907.

Application filed September 12, 1906. Serial No. 334,277.

To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved High-Potential Insulator, of which the following is a full, clear, and exact description.

My invention relates to insulators, my more particular object being to produce a type of high potential insulator possessing certain advantages hereinafter described. Among these are the following: 1. To provide a hood upon its under face with a surface of such conformity as to facilitate the dripping of moisture therefrom very rapidly, thereby reducing surface leakage to a minimum; 2. To provide an insulator hood on its under surface with numerous drip points, air-spaces and barriers in order to further prevent surface leakage and danger of arcing, and to increase the general di-electric properties of the insulator; 3. To provide an insulator having a moisture shedding shield forming an integral part of its base portion and extending out from said base portion in a lateral direction, and resting upon and partially overlapping the upper surface of the cross-arm; 4. To brace a hood so as to give it a maximum of mechanical strength obtainable from a minimum of material; 5. To make provision for cementing the hood upon its supporting member in a novel and very efficient manner; 6. To strengthen the insulator by the aid of a central member of special conformity; 7. To cause the moisture collecting upon a hood to drift in a direction crossing the general length of the cross-arm so as to maintain the cross-arm as nearly dry as possible; 8. To so interlock the insulator body and the separate hood mounted thereupon as to greatly increase the di-electric and mechanical efficiency of the device; 9. To provide an insulating member having integrally connected therewith a hood at its upper portion and a moisture shedding insulating shield at its base portion; 10. To provide the base portion of an insulator with laterally extending insulating portions forming an integral part of said base portion for the purpose of supporting and insulating the line wire or cable in case the upper portion of the insulator should become destroyed; 11. To provide an insulator hood having side grooves with a reinforcing member molded rigidly into and forming a part of said groove for the purpose of strengthening the insulator at that point, and also for preventing chafing and chipping of the material; 12. To attain certain other electrical and mechanical advantages hereinafter set forth.

Reference is made to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical central section through the insulator complete, on the line 1—1 of Fig. 5, this section being taken upon a plane cutting the cross arm in a direction transverse to its general length; Fig. 2 is a fragmentary inverted plan of the upper hood before it is mounted in position; Fig. 3 is a fragmentary plan of the upper end of the insulator showing the grooves for receiving the cement or other similar fastening material; Fig. 4 is a fragmentary section upon the line 4—4 of Fig. 1, looking in the direction of the arrow; and Fig. 5 is a side elevation showing the insulator complete, viewed as from the right of Fig. 1.

The insulator body 5 is made of any suitable insulating material, preferably "electrose," and is provided centrally with a supporting stem 6 of metal having toward its upper end an enlarged portion 7, preferably having the form of a disk with rounded edges, and integral with the stem. The lower end of the stem 6 is provided with a threaded portion 8 and is adapted to extend vertically through the cross arm which is shown at 9. A nut 10 is threaded upon the threaded portion 8 and intermediate of this nut and the cross arm 9 is a washer 11. The lower end of the insulator body 5 is provided with a substantially cuneiform portion 12, from which depend aprons 13 disposed upon opposite sides of the cross arm.

The cuneiform base 12 presents surfaces sloping obliquely downward, whereas the outer surfaces of the aprons 13 are vertical. This conformity of the base and aprons causes water to pass below the lower edges of the aprons 13, thus maintaining completely dry those portions of the cross arm immediately adjacent to the metallic stem 6, and also preventing the entrance of water to this metallic stem. When the nut 10 is properly tightened a considerable initial strain is exerted between the washer 11 and the base 12, so that the insulator body 5 is held quite firmly in position upon the cross arm. A hood 14 is provided at its bottom with slop-

ing edges 18 so cut as to form a swallow fork, as will be understood from Figs. 1 and 5; that is to say, the lower edge of the hood terminates in two surfaces sloping obliquely downwardly and oppositely so as to drift the moisture falling thereupon and to discharge this moisture at two oppositely disposed points 17, the distance between these points being greater than the width of the cross arm 9 when supplemented by the thickness of the aprons 13. The moisture collecting upon the points 17 is discharged in such a manner as not to touch either the aprons 13, the cross arm 9, or that portion of the cuneiform base 12 immediately adjacent to the hood 14. Another hood 15 is integral with the lower hood 14 and is strengthened relatively thereto by aid of an annular reinforcing portion 16 serving as a brace. The hoods 14, 15 being integral, as above stated, together constitute a body portion which is provided with an annular shoulder 19 and with a threaded boss 20, the shoulder encircling the boss and serving as a base therefor. The upper hood 21 is provided with an annular shoulder 22 mating the shoulder 19. The upper hood is also provided with a slot 23 serving as a rest for the cable or other conductor to be supported. A groove 24 may, if desired, be used for accommodating a wire or cable. The upper hood 21 is threaded internally so as to fit upon the threaded boss 20. The upper end of the threaded boss 20 is cut away so as to leave a peripheral channel 25 encircling it, and this channel is connected by cross channels 26, 27, merging into a central recess 29, as indicated in Fig. 3. Cement 28 is poured in from the top, as indicated in Fig. 1, and secures the threaded boss 20 and the hood 21 rigidly together. The cement when in position forms a spider 30 having the general conformity shown in Figs. 1 and 3. The cement may be omitted, however, if desired. The upper hood 21 is provided with radial braces 31 integral therewith, which serve to brace and strengthen the upper hood and also to prevent it from sagging. By aid of these braces a comparatively small amount of material may be given such conformity as will produce a comparatively wide expanse of hood. The hood 21 is further provided upon its lower face with drip points 32, 33, arranged in concentric rows, as indicated in Fig. 2, the drip points of each row being staggered relatively to the drip points of the next succeeding row. These drip points are for the purpose of facilitating the discharge of moisture from the under face of the hood should any happen to concentrate there, and also for localizing as much of this moisture as may not be discharged.

It will readily be seen that if, as sometimes happens, a small quantity of moisture hangs upon the outer face of the hood, it is desirable that this moisture be, as far as practicable, concentrated in drops which depend from the drip points, thus maintaining dry as large a proportion as possible of the under face of the hood. Again, the several concentric rows of drip points are upon the same level and the drip points are thus in the same plane, as will be understood from Fig. 1. This arrangement tends to prevent moisture from passing the outer rows of drip points and to concentrate upon the drip points nearer the center. An annular plane surface 34 is provided intermediate of the outer edge of the hood 21 and the outermost row of drip points. This plane surface is horizontal and tends to prevent the creeping of moisture from the outer edge of the hood to the first row of drip points.

It will be observed also that the radial ribs 31 divide the drip points into series and form barriers therebetween; furthermore, these radial ribs have lower edges that range from the inner ends in an upward and outward direction. This form of the ribs and their arrangement relatively to the drip points is designed to arrest moisture that may be blown across the under surface of the hood; they present barriers to such moisture, and they themselves act as drip members and co-act with the member 35 hereinafter referred to, and with the lower hood 15, so that the moisture thus blown will be arrested and directed against said members 35 and 15, to be discharged.

It will be understood that insulator pins as ordinarily mounted upon cross arms tend to collect moisture by aid of capillary attraction within the joint formed by mounting the pin. This moisture has a great tendency to rot both the cross arm and the vertical member engaging it and carrying the insulator. Even if moisture be excluded from the joint and the insulation is imperfect, the pin and also the cross arm undergo deterioration in consequence of electric action, the general nature of which is not well understood. It is also well known to those skilled in this art that insulator pins, especially if made of wood, undergo a physical deterioration at a point immediately adjacent to the socket of the insulator, also because of electrical action, the general nature of which is not well understood. I avoid all of these difficulties by providing an insulator which has the pin or supporting portion integral with the hood or hoods. I at the same time avoid the difficulties experienced with separate pins, especially at that portion where they enter the cross arm, by so protecting the cross arm by means of my cuneiform base 12 and aprons 13, and further by improving the general insulation, and so forth.

Special attention is called to the sloping edges 18 and the drip points 17, and particularly to the fact that the drip points 17 discharge moisture at points located far enough

from the cross arm and aprons 13 to miss these parts entirely, thus leaving them completely dry.

The hood 21 is provided with an annular portion or rib 35 which encircles an air space 36, also annular in form. This air space extends slightly above the shoulder 19, as will be understood from Fig. 1. This construction presents several advantages. The extension of the air space 36 above the shoulder 19 prevents any chipping or battering of the surfaces when the shoulder 22 is fitted tightly upon the shoulder 19. The cuneiform base 12 is provided at its outer ends with beads 37. These beads are longitudinal in form and are disposed parallel with the slot 23. If for any reason it becomes impracticable to mount the conductors within the slot 23 as, for instance, if the hood 21 be disabled, the cable or other conductor may be rested directly upon the upper edge of the base 12, being prevented from slipping off this edge by the beads 37. These beads may be further employed for supporting additional wires. Again, the deepening of the air space 36 increases the line of surface leakage and tends to prevent the creeping of moisture intermediate of the shoulders 19, 22.

The bracing portion 16 at the base of the hood 15 has a conformity which especially adapts it to strengthen the insulator, where it might otherwise be weakened in consequence of the disk 7. This disk serves as an anchorage for the general body of the insulator, and in order to prevent the conformity of the disk 7 from weakening the insulator, this tendency is compensated for by the thickening given by the portion 16.

The annular groove 24 is formed by properly shaping an iron ring 38, which is molded into the upper hood, as will be understood from Fig. 1. This iron ring is provided with cupping edges 39, 40, serving as anchorages for holding it upon the insulating material constituting the hood. The iron ring 38 thus serves as a general strengthening member for the upper hood, and also as a wearing plate for holding the tie wire. This ring 38 is preferably made of a single piece of metal. It is of great importance, as it strengthens the insulator at its weakest point, and also prevents the possibility of chafing or the breaking off of any portion of the crown of the hood. Being partially embedded, it can never work loose.

I do not limit myself to the exact details of any or all of the parts above described and shown, nor to any particular combination of elements entering into the construction of the insulator. Nor do I limit myself to the use, in every instance, of a central strengthening member, nor to the use of any particular insulating material, though I prefer to employ the material known in this art as "electrose." Nor do I limit myself to the use in every instance to a cement for securing the separate hood to its support.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A device of the character described, comprising an insulator body provided with a hood integral therewith, said hood being fashioned at its bottom so as to present oppositely disposed sloping edges terminating in drip points.

2. A device of the character described, comprising a member of insulating material, a hood mounted thereupon and provided with means for discharging moisture at predetermined points only, said member being provided with a base and with aprons depending from said base, said hood being downwardly sloped to points at opposite sides and said points being outside the vertical plane of the base.

3. A device of the character described, comprising a pin body, a strengthening member mounted centrally therein, and provided with an enlarged portion serving as an anchorage, and hoods mounted integrally upon said pin body at points adjacent to said enlarged portion of said strengthening member, and bracing portions for strengthening said hoods relatively to said pin body at points adjacent to said enlarged portion of said strengthening member.

4. A device of the character described, comprising a hood provided with an annular rib and spaced from the body, the said annular rib projecting downwardly below the seat of the hood and with radial portions extending outwardly from said annular rib for the purpose of strengthening said hood.

5. A device of the character described, comprising a hood of insulating material provided with an annular strengthening rib and with an annular air space encircled by said rib, said rib being further provided with radially disposed bracing portions extending outwardly from said annular strengthening rib the lower edges of said radial ribs ranging upwardly and outwardly from the annular rib.

6. A high potential insulator, comprising a hood provided with an outer edge and with drip points mounted upon said hood and nearer to the center thereof than said outer edge, and means for supporting said hood.

7. A high potential insulator, comprising a hood provided upon its under face with a plurality of drip points arranged in rows, said rows being concentric with each other, and means for supporting said hood.

8. A high potential insulator, comprising a hood of insulating material provided with a plurality of drip points arranged in rows, the drip points of one row being staggered relatively to those of another row, and means for supporting said hood.

9. A high potential insulator, comprising a hood provided with drip points arranged in a plurality of rows, the drip points of one row being alternated between the intervals of the drip points of another row, said hood being further provided inside of the innermost row with means for preventing the travel of moisture, and means for supporting said hood.

10. A high potential insulator, comprising a hollow stem forming a body portion, a hood mounted integrally thereupon, and a cuneiform base integral with said body portion and provided with aprons for protecting a portion of the cross arm from moisture the hollow body portion accommodating a securing pin.

11. A device of the character described, comprising a hood provided with radial rib portions for the purpose of strengthening and supporting the outer portions of said hood the said ribs at their lower edges ranging in an outward and upward direction.

12. A device of the character described, comprising a support, and a member of insulating material mounted thereupon and provided with a hood, said hood having edges sloping obliquely outward from each other and terminating in drip points.

13. An insulator, comprising a hood provided with a plurality of drip points, and with radial ribs disposed at a series of points between the drip points and forming barriers separating the said points into separate groups.

14. In an insulator, a hood having drip points on its under side and an annular depending member at a point inside the drip points, and a second hood below the first hood and projecting outward beyond the said annular depending member.

15. A high potential insulator, comprising a central supporting pin provided with a threaded boss and with channels crossing each other, a hood threaded internally and mounted upon said boss, and a portion of cement filling said channels and securing said hood to said boss the channels extending across the top of the pin and downward at the sides to a point above the threads, and the hood having an aperture through it leading to the channel.

16. An insulator, provided with a base and a hood, said hood being downwardly sloped to points at opposite sides and said points being outside the vertical plane of the base.

17. An insulator provided with drip points arranged in staggered positions.

18. An insulator having radially disposed drip members, the lower edges of which range from the inside in an outward and upward direction.

19. As an article of manufacture, an insulator hood provided with a groove on its upper surface and with an aperture in its under surface, and further provided with a smaller aperture extending from said groove to said first-mentioned aperture.

20. In an insulator, a detachable hood of insulating material provided on its under face with a shoulder for engaging a seat, an annular depending member encircling said shoulder and projecting below the latter, said annular depending member being separated from said shoulder by an air space extending upward beyond said shoulder.

21. In an insulator, a hood of insulating material provided on its under face with a shoulder and with an annular depending member extending below said shoulder and separated therefrom by an air space, said air space being partly above and partly below said shoulder, the under surface of the hood outside of the annular depending member being provided with studs forming drip points.

22. In an insulator, a hood of insulating material provided on its under face with a shoulder and with an annular depending member extending below said shoulder and separated therefrom by an air space, said space extending above and below said shoulder, said hood being further provided with radial ribs, the lower edges of which incline upwardly and outwardly from the annular depending member.

23. In an insulator, a hood of insulating material provided on its under face with a shoulder and with an annular depending member extending below said shoulder and separated therefrom by an air space, said air space extending above and below said shoulder, said hood being further provided outside of the annular depending member with studs forming drip points and with radial ribs separating said drip points into groups and forming barriers therebetween, said ribs joining the annular depending member, and the lower edges of the ribs ranging in an upward and outward direction.

24. In an insulator, a hood of insulating material of disk-like form and having a central portion rising therefrom, said hood having an air space of a general annular form, and a strengthening ring mounted upon said hood.

25. An insulating hood provided on its exterior with a strengthening ring having an upwardly extending inner portion overhanging toward the top, said ring having an outwardly extending lower portion projecting beyond the upwardly-ranging and overhanging portion.

26. An insulator hood having a disk-like portion provided with an annular air space and with a strengthening ring disposed adjacent to said air space.

27. A laterally-extending insulator pro-

vided with an edge and with a broad under surface provided with drip points, said drip points being disposed intermediate said edge and the center of said insulator.

28. An insulator provided with radially-disposed members, and groups of drip points between said members and separated thereby, said drip points being studded upon a flat surface.

29. An insulator hood provided with a comparatively wide disk-like portion and with a central portion projecting upwardly therefrom, and a strengthening member encircling said upwardly-projecting portion and extending laterally a little distance so as to follow the surface of said disk-like portion.

30. A hood provided with a flattened surface, the latter being studded by a plurality of drip points disposed intermediate the edge of said hood and the center thereof.

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

LOUIS STEINBERGER.

Witnesses:
WALTON HARRISON,
E. C. NIELSON.