D. MUNSON.
Lightning-Rod.

No. 204,359. Patented May 28, 1878.

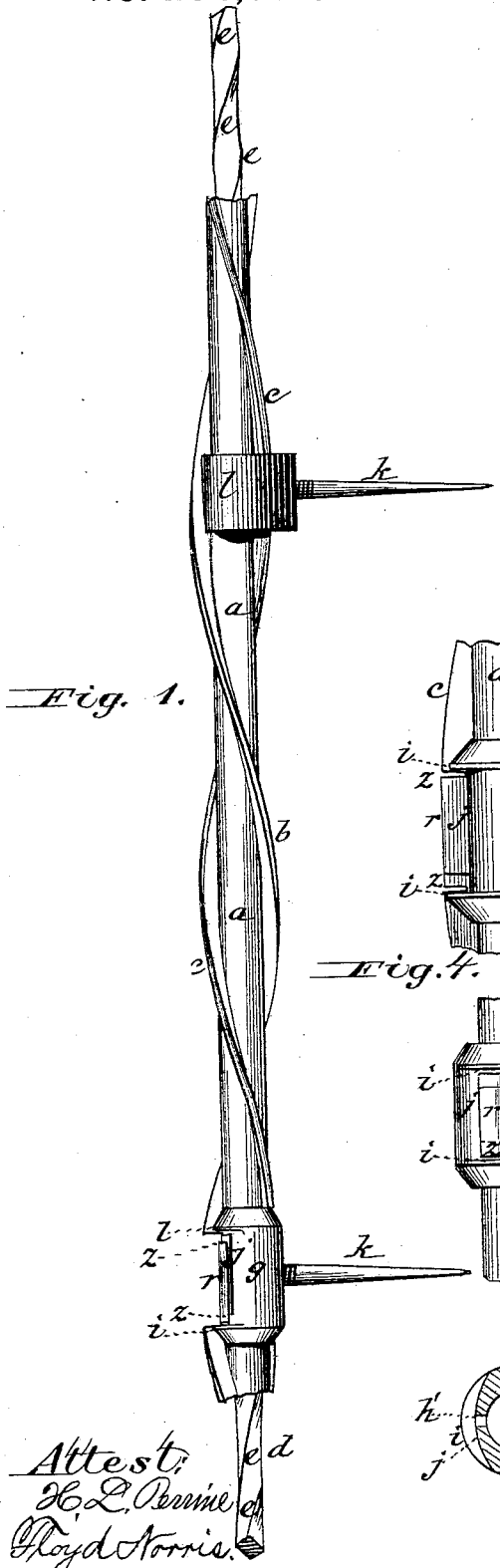


Fig. 1.

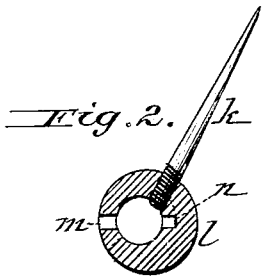
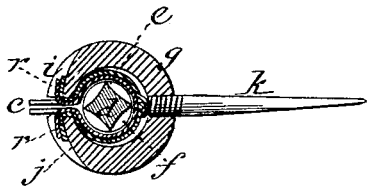


Fig. 2.



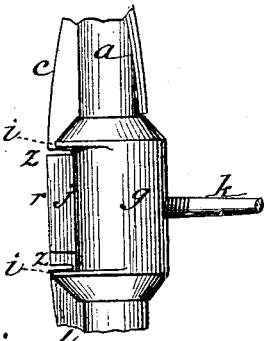


Fig. 4.

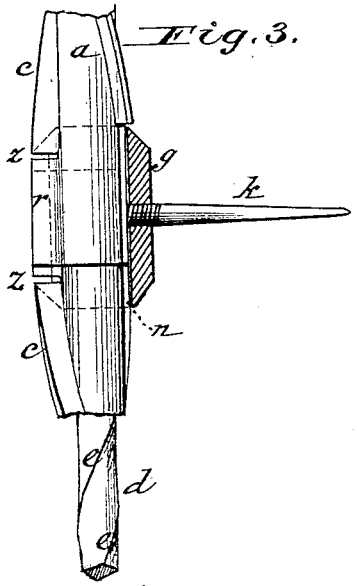
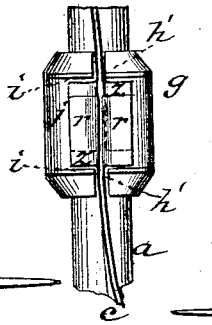


Fig. 3.



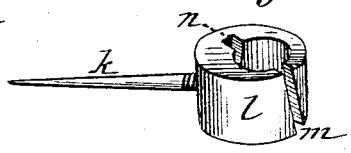
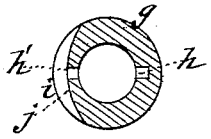


Fig. 5.



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UNITED STATES PATENT OFFICE.

DAVID MUNSON, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN LIGHTNING-RODS.

Specification forming part of Letters Patent No. **204,359**, dated May 28, 1878; application filed March 20, 1878.

To all whom it may concern:

Be it known that I, DAVID MUNSON, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Lightning-Rods; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My improvements are designed to increase the durability and efficiency of the tubular lightning-rod having spiral flanges, one of which is left open the entire length of the rod for the purpose of admitting the electric current to the inner surface of the rod to diminish its intensity and mechanical effect thereon. The principle of this construction is correct, but the rod is liable to collapse and to break when bent over the cornice of the building, and, moreover, requires too much copper to give it the necessary strength. My present improvements are designed to give greater strength, durability, and stiffness, and to increase the efficiency of this form of conductor.

The subject-matter of my invention consists in the combination, with a tubular conductor, having opposite spiral flanges, the meeting-edges of one of which is open, of point-carrying sleeves, having grooves adapted to fit over said spiral flanges, so as to be adjusted thereon by being moved or slid over said rod and upon its spiral flanges into the desired positions, and clamped by screwing the points through said sleeves against the rod, whereby I obtain a multiplicity of points along the rod between its joining ends to reduce the effect of the density of the electric current. The tubular rod is joined together in sections by telescoping or slipping their ends into each other, and I use point-carrying sleeves, of peculiar construction, for firmly joining or coupling these sections. This sleeve has also grooves corresponding to the spiral flanges, over which it fits, and it has surface shoulders for the purpose of allowing the telescoping ends of the open flanges to be cut across coincident with said shoulders, and bent down between them on opposite sides of the groove and upon a flat portion of said sleeve, and in this manner lock the sections together, so that when required they can be drawn apart by straightening up the bent-down portions of the flanges, so as to bring them coincident with the continuous flange and the sleeve-groove.

I use with the tubular rod a galvanized iron core or rod of angular cross-section, and inserted into the tube in sections, the object whereof is not only to stiffen the rod, but to obtain the advantages of having an iron core that will avoid all close contact with the inner side of the copper conductor, and thus avoid any oxidation of the core. This core I prefer to make twisted, so as to form interior spiral edges, the effect of which is to concentrate or disperse the electric current. The hollow surfaces or channels between these edges serve to hold water inside of the conductor, and thus aid the conducting power of the rod. Besides, the spiral turns of the core serve to ventilate the rod by affording access for the air to the interior of the rod, so as to dry the moisture after rains, and keep it clean and bright and free from rust, which destroys the conducting power of copper. In using this galvanized-iron core in sections the required strength and stiffness are obtained, and the copper tube and its spiral flanges can be made much smaller and effect a great saving of copper over the old rod.

Referring to the drawings, Figure 1 represents a portion of a lightning-rod with my improvements; Fig. 2, a cross-section through one of the grooved point-carrying sleeves; Fig. 3, sectional views through one of the grooved coupling-sleeves, showing the manner of securing it to the open spiral flange to unite the tubular sections; Fig. 4, view showing the coupling-sleeve in position, and before and after the cut flanges of the tube-sections are bent down between the shoulders of said couplings; and Fig. 5, the point-carrying adjustable grooved sleeve.

The rod proper consists of a copper tube, *a*, formed of a single sheet with opposite spiral flanges *b c*, the meeting-edges of the flanges

c being open to admit the electric current to the interior of the conductor, as described in a patent granted to me August 5, 1856.

To render this form of rod more durable, and to give it greater stiffness and efficiency, I use a galvanized-iron core, *d*, preferably square, in cross-section, and twisted to form spiral edges *e* with intervening concave sides, so that the edges barely touch the inner side of the tube, as in Fig. 2, while the concave sides form continuous open spaces or channels *f* in the tube, the effect of which is to give a series of interior edges, which, in connection with the outer spiral flanges, concentrate and disperse the electric current, as it is well known that electricity seeks sharp edges. The continuous open interior spaces serve to hold water by their spiral folds during storms, and thus increase the conducting power, and more especially to ventilate the interior of the rod, and to dry its surfaces, and these open spaces, in connection with the galvanized surfaces of the iron core, prevent rust in the interior, which is so detrimental to the conducting power. The galvanized surfaces of the iron rod are thus kept bright and clean because they have no close contact with the copper tube. This iron rod is inserted in the tube in sections, extending throughout its length. By its use I am enabled not only to make the tube of less diameter, but its spiral flanges smaller, and in this way effect a saving of copper of about thirty per cent. over the old spiral-flanged tube, which is a matter of great importance.

The sections of the tube are joined by slipping their ends together, and I use a copper coupling of peculiar construction to render their connection secure. This coupling *g* has a central opening to fit over the tube and grooves *h h'* fitting over and receiving the spiral flanges. One of these grooves, *h'*, extends through the thickness of the sleeve to receive the open meeting flanges, and the sleeve at this point has shoulders *i* formed upon one side at its ends, and between these shoulders the sleeve has a flattened surface, *j*, so that the sleeve by its grooves is slipped over the spiral flanges over the joining ends of the sections, and the open flanges cut across at *z z* coincident with the sleeve-shoulders *i*, to allow the cut portions *r* of said flanges to be turned down between the shoulders on each side of the open sleeve-groove, thus forming a firm and secure lock for the coupling, yet affording the advantage of taking the tube-sections apart, if found necessary, by bending out the cut flange portions, so as to bring them coincident with the flange and in line with the sleeve-groove.

The function of the shoulders is to form a lock not only with the tube proper, but with its flange, to prevent the endwise movement of the sections when coupled, and such stop or stops may be formed in various ways and upon any suitable form of coupling-sleeve, whether annular or cylindrical.

A copper point, *k*, plated or tinned, is screwed into each coupling-sleeve, to further increase the receiving and dispersing power of the rod. To still further increase this effect of the conductor, I employ copper sleeves *l*, provided with grooves *m n*, adapted to fit over the flanges and to be turned or moved in the proper position upon the rod, which sleeves are secured by screwing in a copper point against the tube.

One of the grooves *m* is open like that of the coupling-sleeve and extends through the thickness of the sleeve for the projection of the open flange, which is wider than the thickness of the sleeve. These point-carrying sleeves are thus made to be moved over the spiral flanges, so that they can be arranged along the rod between the couplings, and adjusted to bring their points in the desired positions.

All the points are of copper and plated, and the facility with which the supplemental sleeves can be applied as the rod is put up gives the advantage of multiplying the points readily, and rendering the rod highly effective without increasing the cost over the old rod. These supplemental sleeve-points may be formed of a strip of copper pointed at its ends and bent around over the tube and its flanges and twisted at its pointed ends, so as to form double points; but I prefer the grooved sleeve with the screwed-in points.

I claim—

1. A tubular lightning-rod, having a galvanized-iron core of angular cross-section, forming interior edges and intervening spaces, and inserted into the tube in sections to form non-oxidizing surfaces with continuous edges and ventilating-spaces, for the purpose specified.

2. The combination, with a spirally-flanged electrical conductor, of coupling-sleeves having grooves to receive said flanges and shoulders to form locks or holds, between or over which cross-cut portions of the telescoping open flanges are bent down upon said sleeves, substantially as herein specified.

3. The supplemental grooved sleeves adapted to be adjusted over the spiral flanges of the tubular rod, in combination with the screw-point for securing the same, substantially as described, whereby to re-enforce the conductor with a multiplicity of adjustable points.

4. The combination, with a copper tubular rod, having external spiral flanges, of a galvanized-iron core forming interior concentrating edges for the electric current, as specified.

In testimony that I claim the foregoing I have affixed my signature in the presence of two witnesses.

DAVID MUNSON.

Witnesses:
JOHN S. WRIGHT,
EMANUEL HAEFGER.