(No Model.)

C. A. LIEB.

POLE FOR ELECTRIC WIRES.

No. 453,286. Patented June 2, 1891.

Fig. 1.

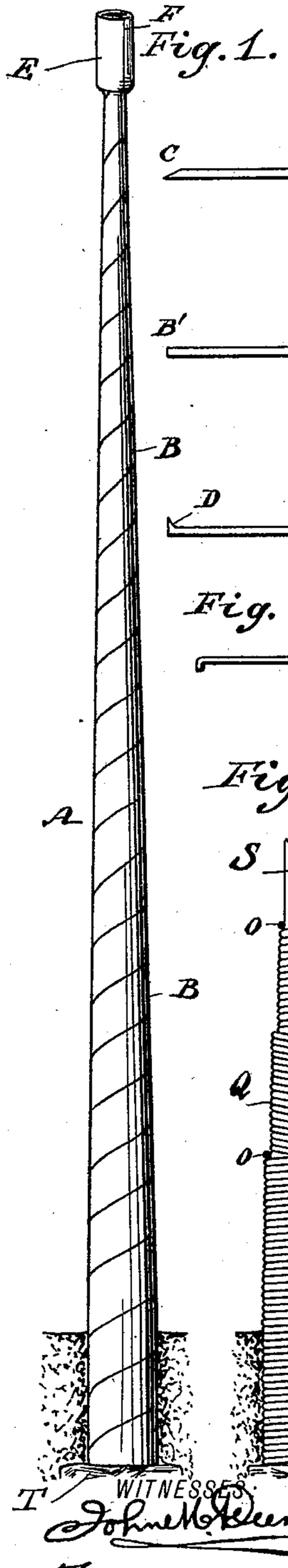


Fig. 8.

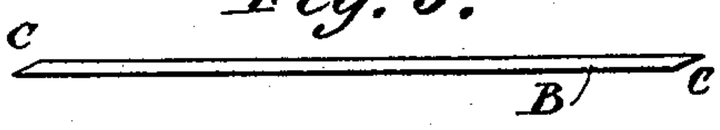


Fig. 7.

Fig. 9.

Fig. 10.

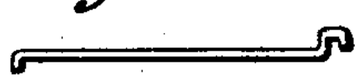


Fig. 6.

Fig. 5.

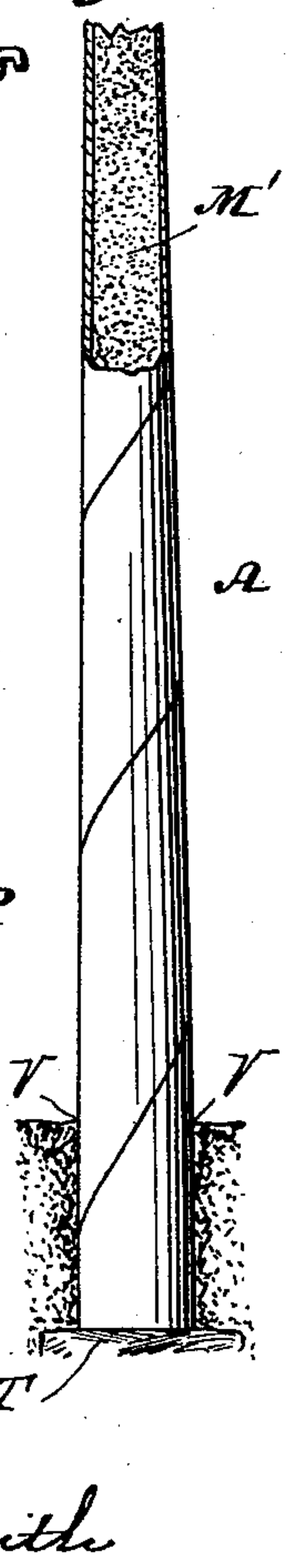


Fig. 2.

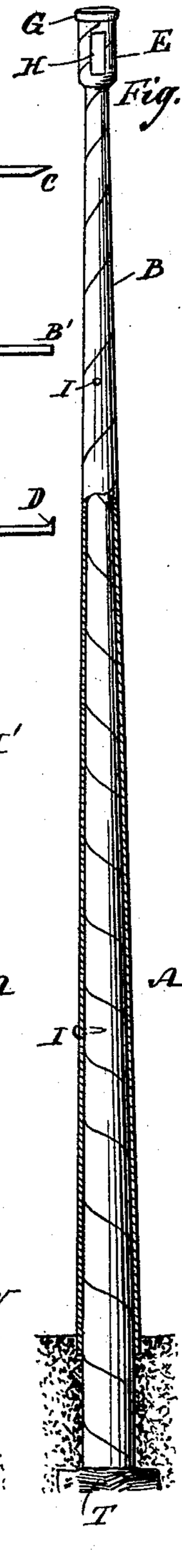


Fig. 3.

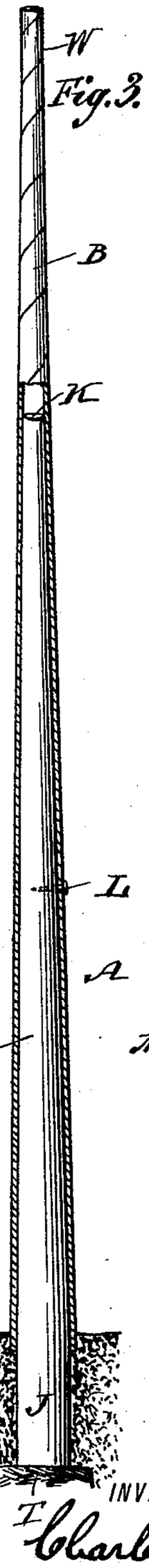
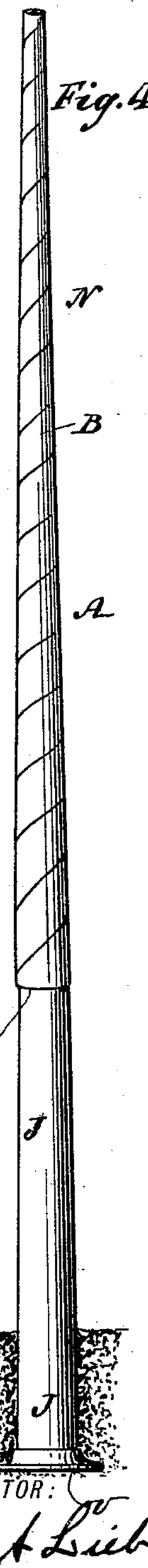


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES A. LIEB, OF NEW YORK, N. Y.

POLE FOR ELECTRIC WIRES.

SPECIFICATION forming part of Letters Patent No. 453,286, dated June 2, 1891.

Application filed November 3, 1890. Serial No. 370,157. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. LIEB, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improved Poles for Electric Wires, of which the following is a specification.

My invention relates to improvements in poles for supporting the wires of telegraph, telephone, and similar lines, also for overhead electric-railway systems and other analogous uses, being applicable also to many other purposes.

It consists in making the poles of spirally and taperingly disposed strips of metal or wire, preferably fastened together at their places of contact, or at some of such places, and the poles may be filled with a suitable filling material to stiffen them and to prevent kinking or buckling; also there may be two poles telescoped together, so as to form one pole or structure.

I also include in my invention the formation of a box or chamber at the upper end of the poles, in which switches, lightning-arresters, and similar appurtenances of such structures may be placed, whereby they will be fully protected, will be out of the way and out of sight, and securely maintained in proper position.

In the drawings hereof the same reference-letters indicate the same parts in all the figures.

Figure 1 illustrates an elevation of the invention in its simplest form. Fig. 2 illustrates an elevation of two poles, one telescoped within the other, the inner one being shown in elevation and the outer one partially in section. Fig. 3 illustrates a wood-filled pole, partly in section. Fig. 4 illustrates a pole similar to that shown in Fig. 3, but with a part of the metal removed at the base of the pole. Fig. 5 illustrates a cement-filled pole, partly in section and broken off at the top. Fig. 6 illustrates a pole made of wire or narrow strips of metal, also broken off. Figs. 7, 8, 9, and 10 illustrate various methods of cutting or rolling the metal when the poles are made of strips of metal.

In the drawings the proportions are or may not be exactly right. They are not intended as construction drawings.

A is the pole. It is made of spirally-wound strips of metal B, the meeting edges whereof are secured together. These strips may be made as shown in Figs. 7, 8, and 9 in end view—that is to say, the edges may be square, as shown at B′ in Fig. 7, or cut or rolled on a bevel, as at C, Fig. 8, so that they will overlap each other when rolled spirally on a tapering spindle or arbor, which is the way in which I prefer to make the poles, soldering, welding, or brazing the edges together during manufacture, or afterward, as preferred.

If made as shown in Fig. 8, the welding, soldering, or other means of securing the edges together will be more complete and efficient, or the strips or plates of metal may have a rib or flange D, Fig. 9, formed on its edges, one or both, which, coming together when the metal is spirally wound and being heated, may then be pressed down flush with the face of the pole by suitable rollers or other means acting on the metal while hot preferably in conjunction with a suitable flux. Thus the joint will be filled and a smooth, very strong, and finished union secured.

E is an enlarged part of the pole constituting a chamber at its upper end adapted to contain lightning-arresters, switches, and other appurtenances, fittings, or attachments of such structures. This chamber may be made by winding the metal spirally about an enlarged part of the arbor and swaging or rolling it into shape, as shown in Fig. 2, or there may be a substantially square or other appropriately-shaped piece of the metal on the end of the strip, which may be folded or rolled over upon itself, as shown in Fig. 1, thus having a vertical line of union, as at F, or the chamber may be made separately from the pole and attached thereto in any suitable manner. It is obvious that this chamber may be of any shape—round, square, or otherwise. By its use I avoid the unsightly boxes and other devices now fastened to the sides of the poles by clamps and in a variety of other ways, which are continually getting out of order, are expensive, and require separate means of attachment. The upper open

end of the chamber E may be closed by a cap G or in any other preferred manner, and there may be a door H, made in the side of the chamber for the insertion and adjustment or repair of the devices contained therein.

In Fig. 1 I show a pole made as above described.

In Fig. 2 I show a stiffer pole comprising one pole inserted within another. The spiral arrangement of the metal in one of them is preferably different from that of the other, as shown, and the chamber E is of course made on the outer one only. These two poles may be united by bolts or screws I or in other ways, if desired, or they may be left simply superposed one upon the other, gravity being sufficient to hold them in place in most instances.

In Fig. 3 I show a pole, partly in section and partly filled, with a timber core J. It may extend to the top of the pole or only part way, as shown, stopping at K, and a pin or bolt L may be inserted through the metal into the wood to prevent the pole from twisting on the core. The core will effectually prevent buckling of the pole and also stiffen it somewhat.

In Fig. 4 I show a pole the metal part whereof terminates somewhat above the ground, as at M. This form is useful where it is desired to save expense, and also to insulate the pole from the ground and also to prevent possible accident to passers by the metal part of the pole will in this last case terminate man high above the ground, sidewalk, or pavement. In this figure J is the wooden core of the pole, and A is the pole proper or metal part thereof.

In Fig. 5 I show a form of my pole in which the spiral arrangement of the metal is not so marked as in the other forms, and it is filled with a cement of some suitable kind, or a composition of cement and ashes, gravel, broken stone, or the like, which hardening will prevent the buckling of the pole, and will also add to its solidity and prevent internal rusting.

In Fig. 6 I show a pole made of spirally-wound wire or narrow strips of metal O. This form of post should be wound in layers and each layer united together by galvanization or by welding or other suitable means. I show three distinct layers P, Q, and R of wire or metal strips alternating in the direction of the wind. Of course there must or should be a tapering central core S shown broken off at the top, about which the metal will be wound, or at least the first layer thereof, during manufacture.

In Fig. 10 I show a sectional view of a modified construction of the edges of the metal. It is rolled to have tongue *a* and groove *b* on opposite edges, so that when rolled up spirally the tongue and groove will interlock, thus giving added strength and stiffness to the pole. The engagement of these parts alone will ordinarily be sufficient to secure the union; but, if desired, solder, galvanizing, brazing, or other means may be employed. I show this form only as one method of interlocking the meeting edges. Other methods may be employed.

It will be observed that the grain of the metal extends in continuous spiral lines around and around the pole, thus avoiding the weak places in ordinary gas-pipe poles occasioned by the vertical welding-seam.

At the bases of all the posts I show a stone T, it being usually preferred to set them on such a foundation. If no stone be used, the bottom of the posts may be closed by a cast-metal plate or cap U, (see Fig. 4,) or a plug of wood tightly fitting may be driven therein or otherwise applied, so as to prevent settling into the earth.

If the expense of the metal be a matter of much importance, the tapering feature of the pole may cease at a suitable distance above the ground or at any preferred place. In this way some metal is saved.

In Fig. 3 I show the top of the pole perfectly cylindrical for a short distance, as at W. This is sometimes desirable for the attachment of the pole-fittings for the wires, &c.

I do not limit myself to the details of construction, because they may be somewhat departed from and still the essentials of my invention be employed. In some instances it will not be necessary to weld the meeting edges, solder or even galvanizing being sufficient to hold it; also, where I make two poles into one by telescoping one into the other, as shown in Fig. 2, the outer one may be quite short and not extend more than about two-thirds the distance from the top down to the ground, and also the inner pole need not extend much higher than within a third of the distance to the top, because the poles seldom break at their extreme limits, but mostly within their medial sections; also, it is not essential that the convolutions of the spirally and taperingly wound metal should be united at all points along the joints. I place no limitations whatever upon myself in any of the above respects.

I claim—

1. A pole composed, essentially, of metal strips or wire wound in a tapering spiral, the convolutions of the same being united together, and a filling material within said pole to re-enforce the same, substantially as set forth.

2. A pole composed, essentially, of metal strips or wire wound in a tapering spiral, the convolutions whereof are united together, and a chamber at the top of the pole for the reception of the fittings for the pole, substantially as set forth.

3. A combined wood and metal pole composed, essentially, of metal strips or wire wound in a tapering spiral, the convolutions whereof are united together, and which compose the upper part of the pole, the lower portion whereof at least man high from the ground

is made of wood, which enters the lower part of the metal portion, substantially as set forth.

4. A pole composed of two separate metallic poles, one inserted within the other, substantially as set forth.

5. A pole composed, essentially, of two separate and detached poles, each made of spirally and taperingly wound metal and inserted or telescoped within each other, the spiral arrangement of the metal being different in one from the other, substantially as set forth.

6. A pole comprising, essentially, two poles, each made of spirally and taperingly wound metal, one inserted within the other, and a chamber upon the upper end of the outer one, substantially as set forth.

7. A pole comprising, essentially, a spirally-wound strip of metal, the meeting edges of the convolutions being upset and secured together, substantially as set forth.

8. A strip of metal for making poles, the edge whereof has a rib or flange thereon adapted to be flattened down when welded, substantially as set forth.

9. A pole composed, essentially, of metal strips or wire wound spirally and having interlocking parts, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 1st day of November, A. D. 1890.

CHARLES A. LIEB.

Witnesses:
PHILLIPS ABBOTT,
WILLIAM OLSIN.