

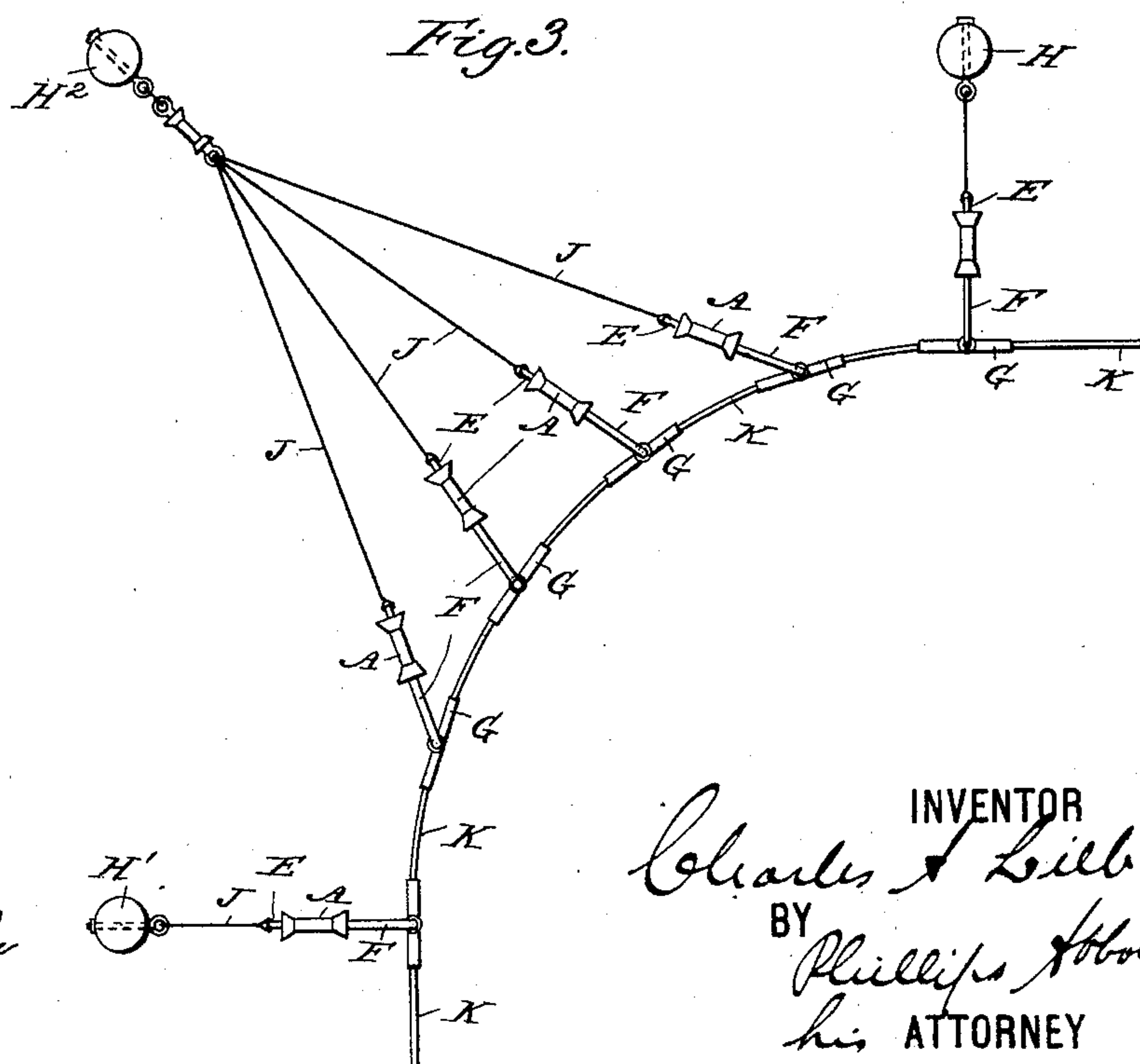
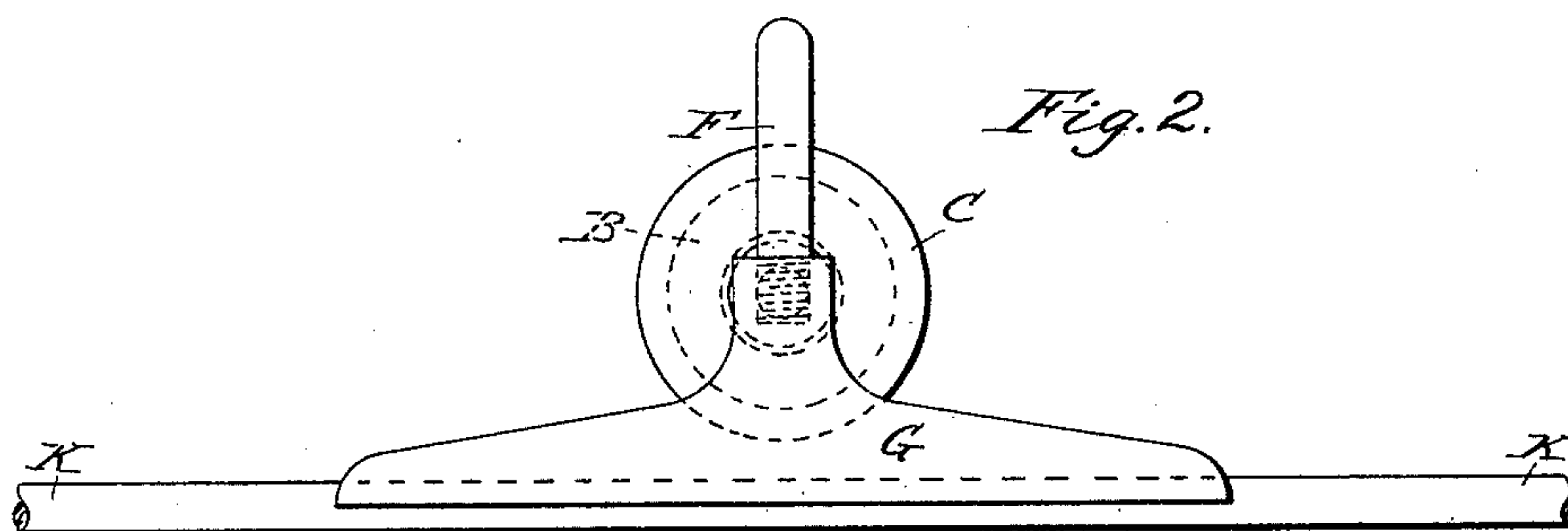
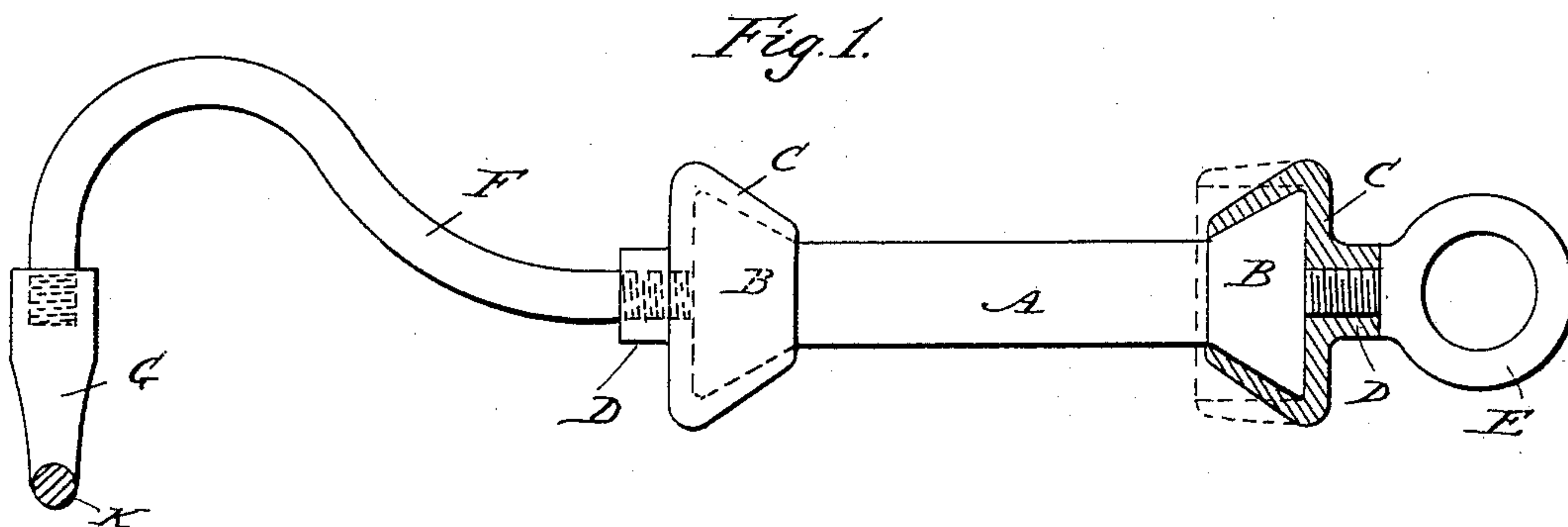
(No Model.)

C. A. LIEB.

SUSPENDER OR SUPPORT FOR OVERHEAD WIRES.

No. 435,505.

Patented Sept. 2, 1890.



WITNESSES:

D. C. Reusch.  
J. C. Smith

INVENTOR

Charles A. Lieb  
BY  
Phillips Abbott  
his ATTORNEY

# UNITED STATES PATENT OFFICE.

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

## SUSPENDER OR SUPPORT FOR OVERHEAD WIRES.

SPECIFICATION forming part of Letters Patent No. 435,505, dated September 2, 1890.

Application filed June 13, 1890. Serial No. 355,373. (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 Improvements in Suspenders or Supports for Overhead Wires, of which the following is a specification.

My invention relates to improvements in insulated supports for overhead wires; and it consists in the construction and arrangement of the device and its several parts, as hereinafter set forth.

Figure 1 illustrates an elevation of the supporter. Fig. 2 illustrates a front elevation as seen from the left of Fig. 1. Fig. 3 illustrates a plan of an overhead wire suspended on a curve by my improved insulated supporters.

A is a piece of wood or equivalent non-conductor of electricity having inwardly-tapering ends B B.

C is a metallic cap, which is in the first instance made in cup form, as shown in dotted lines in Fig. 1 at the right—that is to say, the sides of the cup are parallel. The cap while in the cup form is slipped over the conical end of the piece A, and the forward edges of the cup are then by the action of suitable dies or otherwise closed down upon the conical face of the parts B, as shown, the metal being preferably upset in so doing. Thus I secure a very firm hold of the cap C upon the non-conducting part A, and the entire strength of the conductor is availed of to resist rending strains.

On the rear part of the metallic caps C, I prefer to make a boss D, through which a threaded hole is made, in which an eye E may be fixed, and at the other end a curved rod F is in like manner attached. Of course the bosses will not be necessary if the metal be sufficiently thick to give good hold for the screw-threads. On the end of the rod F, I attach a piece of metal G by screw-threads, as shown, or otherwise. The under edge of this piece G is preferably grooved to conform to the wire, so that it may be firmly soldered or otherwise attached thereto.

In Fig. 3 I show my improved suspending device in operation, it being assumed that the wire is to be suspended on a curve. H H' H'' are posts, which may be set substan-

tially as shown. The supporters are attached to the tops of the posts H and H' by wires J or otherwise, as preferred, and the metallic connection-pieces G are soldered to the wires, as usual. At the post H<sup>2</sup> a supporter is attached, which has two eyes E—one at each end—and from it wires J extend to a series of supporters, which have the eyes E at one end, with which the wires J connect, and the rods F at their other ends having the pieces G, which are soldered to the line-wire at such angle as may be necessary. The angle may be changed to suit the necessities of the case by simply turning the rod F slightly in the thread-hole in the piece G.

It is obvious that my supporters may be used vertically, horizontally, or at any intermediate angle, and that their construction is such that they are exceedingly strong, because the strain to rend them apart must be such as to either strip the threads between the caps and the pieces which screw into them or else sufficient to pull the caps off from the conically-shaped ends of the medial parts A, which of course requires an enormous expanding-strain; also, that the cost of my improved form is very little. It is not essential that the eyes E and the rods F should be separate pieces attached to the caps C. They may be made integral with the caps, if preferred.

It is obvious that alterations may be made in the details of construction of my device and still the essential features of my invention be present. For instance, the enlarged parts of the non-conductor need not be conical nor round. Any construction in which the interlocking of the cap with the non-conductor occurs may be employed—as, for instance, the end of the non-conductor may be expanded, as by splitting or upsetting or pressing the parts forcibly together; also, I prefer to treat the non-conductor, if made of wood, with a suitable water-proofing substance either applied as an exterior coating or by saturation.

I call particular attention to the fact that by my construction I am enabled to secure a most durable form of this device, because I can swage the metal so firmly down upon the non-conductor as even to indent it as much as I wish. Thus I overcome any tendency of the parts to become loose by reason of shrinkage or wear. The hold of the cap



upon the non-conductor is perfectly rigid, firm, and lasting; also, the effect of the strain is to render the hold of the parts each upon the other stronger and stronger because of the  
5 compressing action on the non-conductor because of the shape of the parts.

I claim—

1. A non-conducting suspender for electric wires, &c., comprising, essentially, a non-conducting part provided with an enlarged portion, and a cap formed of a single piece of metal which conforms to the shape of the enlarged portion of the non-conductor and provided with means whereby it may be attached  
10 to a support, substantially as set forth.

2. A non-conducting suspender for electric wires, &c., comprising, essentially, a non-conducting part having two enlarged portions and two caps, each formed of a single piece of  
20 metal which conforms to the shape of the enlarged parts of the non-conductor, and having at one end attached to the cap means whereby the suspender may be held to a support and at the other means for making connection  
25 with the wire, substantially as set forth.

3. A non-conducting suspender for electric wires, &c., comprising, essentially, a non-conducting part having enlarged portions and caps fitting over the enlarged parts of the

non-conducting portion, the sides whereof are  
30 swaged into close contact therewith, substantially as set forth.

4. A non-conducting support for electric wires, &c., having a wooden non-conducting part provided with an enlarged end and a  
35 metallic cap the sides whereof are swaged down upon the enlarged part of the non-conductor, substantially as set forth.

5. A non-conducting suspender for electric wires, comprising a non-conducting portion  
40 treated with water-proofing material and having enlarged parts over which are placed metallic terminals, substantially as set forth.

6. A non-conducting suspender for electric wires, &c., comprising a non-conducting portion having enlarged parts and metallic parts  
45 applied to the enlarged parts of the non-conductor in such manner that longitudinal strain tends to compress the non-conductor, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 11th day of June, A. D. 1890.

CHARLES A. LIEB.

Witnesses:

FREDERICK SMITH,  
PHILLIPS ABBOTT.