

(Model.)

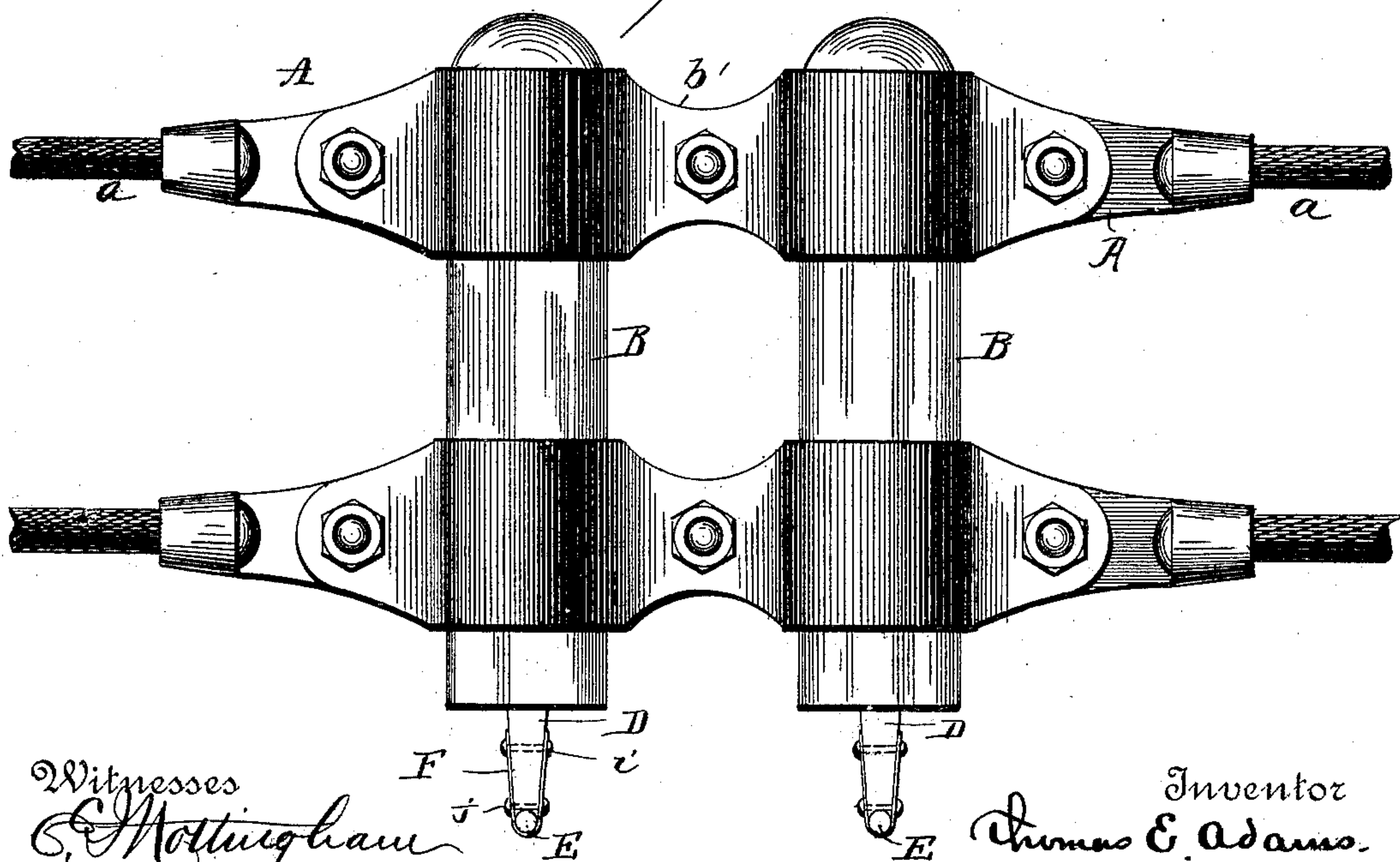
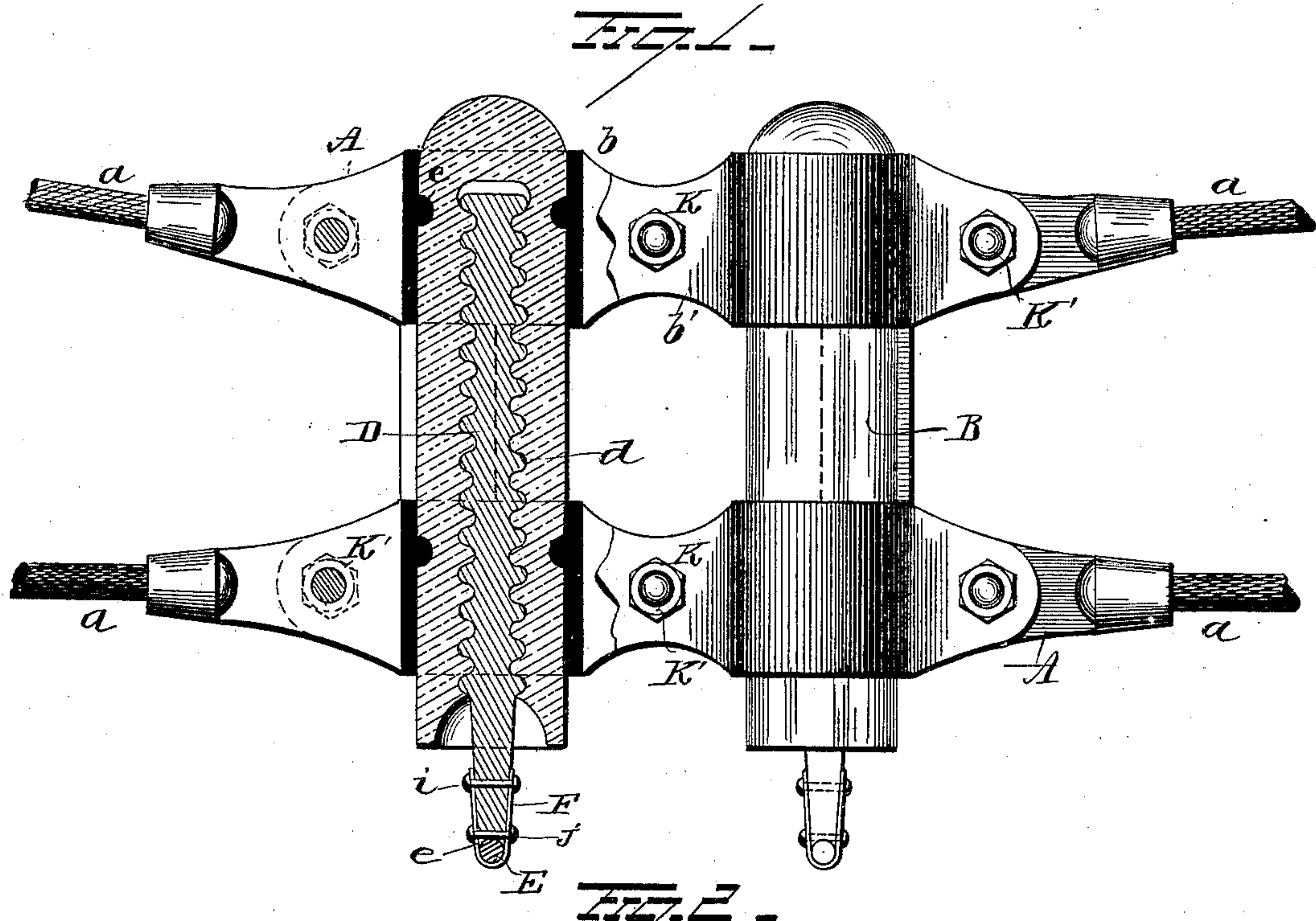
2 Sheets—Sheet 1.

T. E. ADAMS.

DEVICE FOR SUSPENDING ELECTRIC CONDUCTORS.

No. 408,334.

Patented Aug. 6, 1889.



Witnesses
C. Nottingham
V. E. Hedges

Inventor
Thomas E. Adams.
By his Attorney
H. A. Symmons

(No Model.)

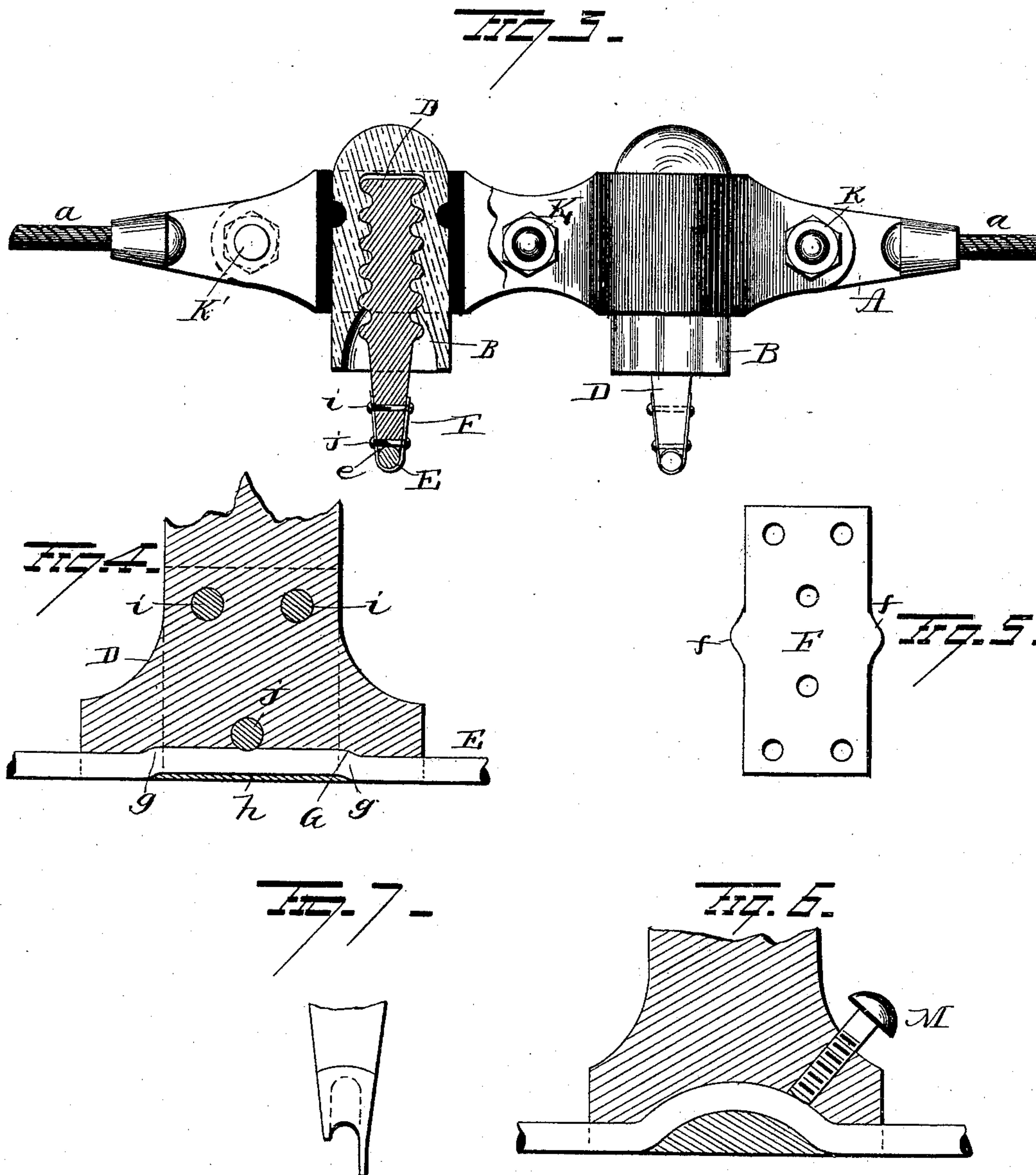
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H. A. Szymon.

UNITED STATES PATENT OFFICE.

THOMAS E. ADAMS, OF CLEVELAND, OHIO.

DEVICE FOR SUSPENDING ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 408,334, dated August 6, 1889.

Application filed January 9, 1889. Serial No. 295,831. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. ADAMS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Devices for Suspending Electric Conductors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in devices for suspending electric conductors employed in conveying the current for operating street-car motors and for other similar purposes.

The object of the invention is to provide a device by which the conductors may be suspended in such manner as to insure a good electrical contact between the insulator-clip and the conductor.

A further object is to provide the conductor at its points of attachment to the suspending clamp or device with a straight and even surface for the trolley or moving contact to roll or slide upon and to accomplish this result without forming a break or joint in the conductor.

A further object is to provide a strong and reliable support for the conductor, and one which will effectually withstand any lateral strains.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of one embodiment of my invention, a portion of the clamp and insulator being shown in vertical section. Fig. 2 illustrates another embodiment of my improvement. Fig. 3 represents still another embodiment of the invention. Fig. 4 is a detail sectional view of the lower portion of the insulator-pin. Fig. 5 is a detached plan of the supporting-clip, showing its shape before being bent and secured in place. Figs. 6 and 7 represent detached sectional and side views of a modified construction.

In Fig. 1, A represents a suitable metal clamp, to the opposite ends of which are se-

cured the two suspension-wires or wire cables *a a*, and by means of which the clamps are retained in a perpendicular position, being retained against any lateral strain to which they may be subjected. Clamps constructed as above are especially adapted for suspending the conductors at curves in the trackway, because by reason of their strength and the attachment of the two suspending wires or cables at their upper and lower ends the conductors may be held rigidly against lateral movement or displacement. Instead of using two suspending wires or cables *a a* on each side of the clamp, as represented in Fig. 1, the clamps may be constructed as represented in Fig. 2 or 3, and in the latter case be suspended by a single wire or cable connected to its opposite ends.

B represents the insulators, which may be made of glass, porcelain, vulcanized fiber, or any other good insulating material. Each insulator B is secured between the two parts *b b'* of the clamp by means of plaster-of-paris or india-rubber or other suitable material interposed between the clamp and insulator, the latter being constructed with a groove *c* or with a corrugated surface to insure a firm engagement of the yielding or elastic material with its outer surface and prevent its becoming disconnected from the clamps, the two parts of the clamp being fastened together by the nuts K and bolts K'.

D represents an insulator-pin, which is preferably made of malleable iron, although it may be constructed of any suitable material. The insulator-pin is constructed with a screw-threaded shank *d*, or the latter may be flattened and corrugated, it being only essential that the pin be securely held within the insulator. The lower end of the insulator-pin is flattened and elongated, so as to form an extended bearing for the conductor E, which latter is seated on a concave bearing *e*, formed in the lower end of the pin.

F is a sheet-metal clip made in the form shown in Fig. 5, and provided with two laterally-extended ears or projections *f f*, for a purpose hereinafter explained. The conductor is placed against its seat on the lower end of the insulator-pin, and then by means

of pressure forced into the depression G, thereby forming the bends *g g* in the conductor and the depression *h* in its lower surface. The clip F is bent around the conductor, the opposite ends of the clip being secured to the opposite faces of the insulator-pin by means of the rivets *i i*, while the rivet *j* is inserted through the insulator-pin, so as to come in direct contact with the conductor and form an interior and protected electrical contact therewith, which contact prevents the formation of arcs or undue resistance when the trolley passes over the supporting-clips. Instead of using the rivet for this purpose, I may employ a set-screw for the same purpose. The clips F are received within the depression G on the under side of the conductor, produced by the bend formed therein, and the ears or projections *ff* extend outwardly and fill up the inclines *h* at the bent portions of the conductor. The under side of the clip may be filed down at its ends, so as to form a smooth and even trackway for the trolley, and thereby prevent the latter from jumping as it passes over the clip.

Instead of employing a separate sheet-metal clip F, the construction illustrated in Figs. 6 and 7 may be used. In the latter the lower end of the insulator-pin is provided with a depending lip L, which is bent around the conductor, and the supplemental contact with the latter formed by a set-screw M. In either form of construction the conductor is insured an extended contact-surface with the insulating-pin, and by reason of which a good electrical contact and a strong and durable connection is made therewith. The bend in the conductor allows of the formation of a connection of such a character as will provide a smooth and even trackway for the trolley, and further prevents the slipping of the conductor through its support, and thereby obviates any sagging of the conductor between its supports.

As it is evident that many slight changes in the construction of parts might be resorted to without departing from the spirit and scope of my invention, I would have it understood that I do not limit myself to the particular construction and arrangement of parts shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device for supporting electrical conductors, an insulator-pin constructed with a recess or depression for the reception and attachment of a bent portion of the conductor, substantially as set forth.

2. The combination, with an insulator-pin provided with a recess or depression in its lower end, of a conductor provided with a bend which is fitted into said recess or depression, substantially as set forth.

3. An insulator-pin constructed with a recess or depression for the reception and at-

tachment of a bent portion of the conductor, and a clip that extends beneath said recess or depression, substantially as set forth.

4. The combination, with an insulator-pin constructed with a recess or depression in its lower end and a conductor provided with a bend that fits within said recess or depression, of a clip that encircles the bent portion of the conductor, the lower surface of the clip being in a plane parallel with that of the under side of the straight portions of the conductor, substantially as set forth.

5. The combination, with an insulator-pin constructed with a recess or depression in its lower end, of a clip the opposite ends of which are riveted to the insulator-pin, substantially as set forth.

6. The combination, with an insulator-pin constructed with a recess or depression in its lower end, of a clip provided with laterally-projecting ears, substantially as set forth.

7. The combination, with an insulator-pin provided at its lower end with an elongated concave seat having a recess or depression formed between the ends of said seat, of a clip constructed and arranged to encircle the seat and retain a conductor in contact therewith, substantially as set forth.

8. The combination, with an insulator and a clip for securing a conductor thereto, of an electrical contact inserted through the pin and adapted to engage the upper surface of the conductor, substantially as set forth.

9. The combination, with an insulator and a clip for securing a conductor thereto, of a rivet inserted through the clip and insulator-pin and forming an electrical contact with the conductor, substantially as set forth.

10. The combination, with a clamp, of an insulator secured thereto by yielding or elastic material interposed between the clamp and insulator, substantially as set forth.

11. The combination, with a clamp, of an insulator constructed with a groove or recess on its outer surface, and yielding or elastic material interposed between the clamps and insulator, substantially as set forth.

12. The combination, with a two-part clamp, of an insulator secured between the two parts of the clamp, and yielding or elastic material interposed between the clamp and insulator, substantially as set forth.

13. The combination, with a clamp, of two insulators secured between the two parts of the clamp, each insulator having yielding or plastic material interposed between its outer surface and the surface of the clamp, substantially as set forth.

14. The combination, with two insulators and clamps constructed and arranged to engage the insulators at their upper and lower ends, of two suspending-wires attached to the opposite ends of each clamp, substantially as set forth.

15. The combination, with the insulator-pin and its clip, of the conducting-wire formed

with an offset or bent portion fitted to the clip, substantially as set forth.

16. The conduction-wire formed with an offset or bent portion and the clip fitted thereto, the clip being provided with a hole at its upper end for connection with the insulator-pin, substantially as set forth.

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

THOS. E. ADAMS.

Witnesses:

JOHN C. DOLPH,
W. A. PALLANT.