(No Model.)

E. THOMSON.

ELECTRIC RAILWAY CONDUCTOR.

No. 446,483. Patented Feb. 17, 1891.

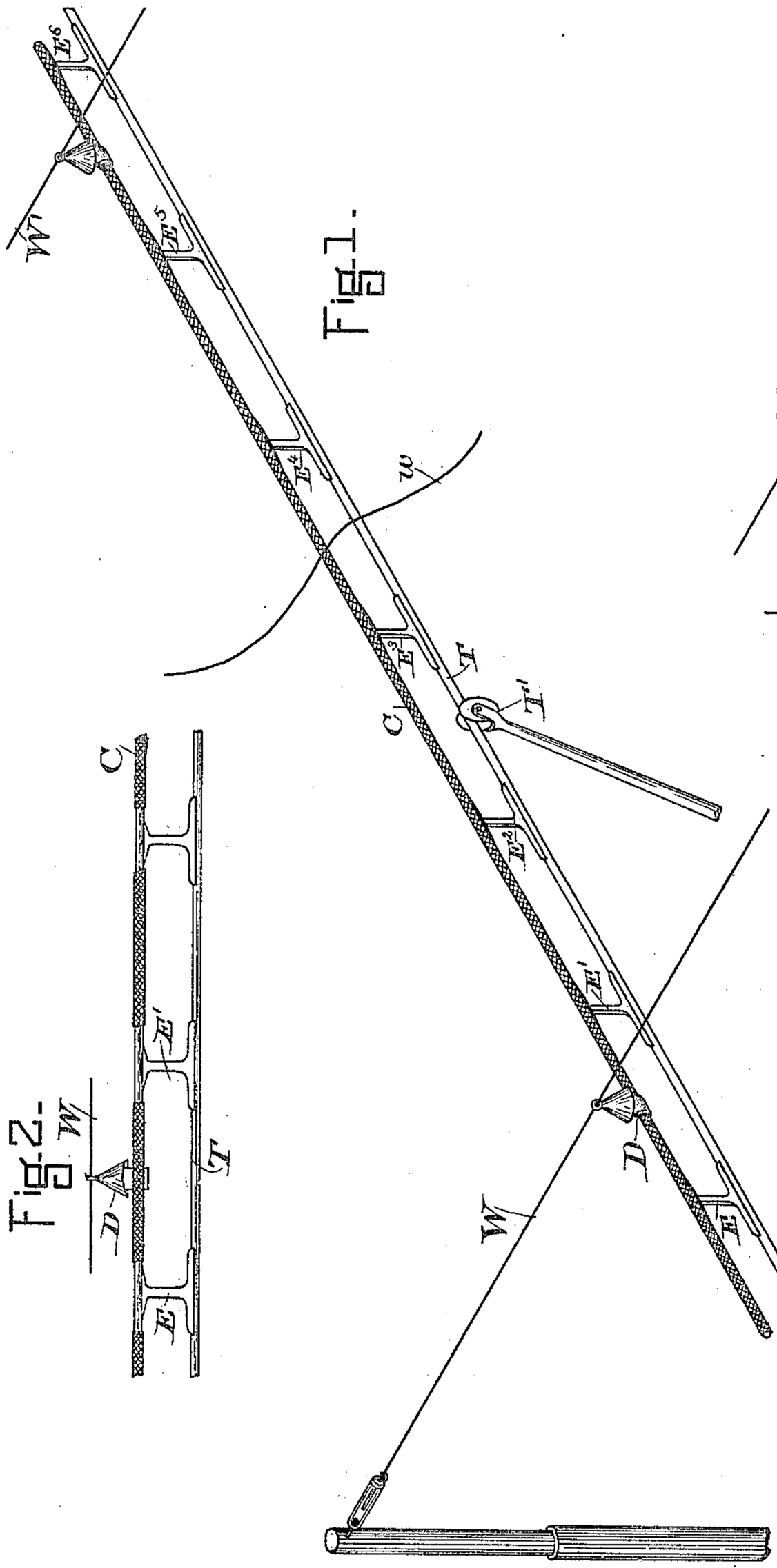

Fig. 1.

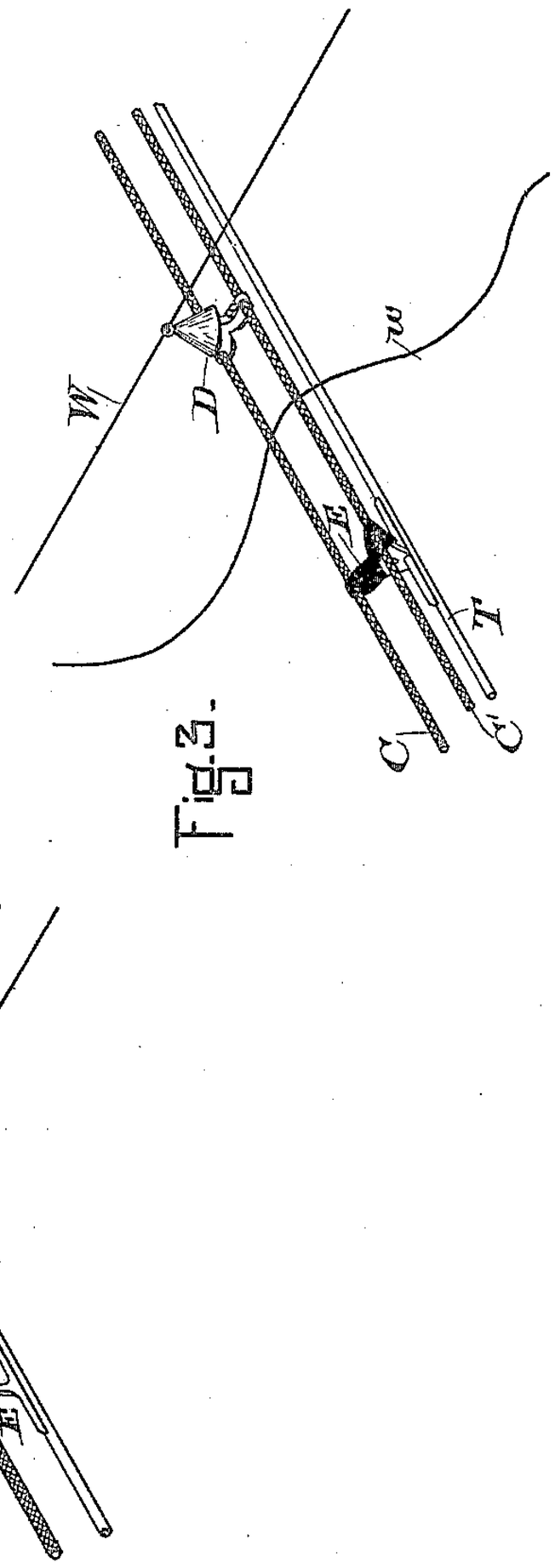

Fig. 2.

Fig. 2.

WITNESSES:

A. Hillmer

C. L. Haynes

INVENTOR

Elihu Thomson

BY

Burke & Knight

ATTORNEY.

UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS.

ELECTRIC-RAILWAY CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 446,483, dated February 17, 1891.

Application filed March 22, 1890. Serial No. 344,933. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Overhead Conductors for Electric Railways, of which the following is a specification.

My invention consists in an improved manner of supporting the bare trolley-wire, in supplying the same with current, and in protecting it from short circuits or grounds caused by the falling upon it of other wires, such as telephone, telegraph, or signaling wires.

The invention also consists in an improved way of attaching the span-wires or cross supporting-wires to the overhead conductor, so as to obtain the greatest insulation or resistance between the trolley-wire and earth.

Briefly, the invention consists in suspending the bare trolley wire or conductor below an insulated feeding-conductor run parallel with it, the former being connected to the latter at proper intervals for obtaining adequate mechanical support and points of attachment for supplying current sufficient in number to maintain an economical electro-motive force of the current, thus preventing undue losses in the overhead conductor by a falling off in the potential of the current supplied to the motors on the car.

It also consists in placing one or more feeding-conductors thoroughly insulated throughout their length immediately above the trolley-wire proper and in attaching the span or cross supporting wires directly to such insulated conductor or conductors in such fashion that in wet and rainy weather long insulating-surfaces must be covered with moisture before current can leak to earth, while at the same time bare wires of other systems falling upon such insulated conductors cannot make a circuit to earth, but will be caught on the insulating-surface.

Figure 1 illustrates an overhead conductor constructed after the manner of the invention. Fig. 2 shows how the bare wire for the trolley-wheel is attached to and supported by the upper insulating and feeding conductor. Fig. 3 shows a modification in which two insulated conductors are placed above the bare trolley-wire, showing also the modified manner of supporting the trolley-conductor and the position of the span-wires.

In Fig. 1, C is a heavy copper wire of such cross-section as may be required to give sufficient mechanical strength when attached to guy or cross wires W W′, suitably secured thereto at intervals along the line and of sufficient conductivity to convey current to the motors on the cars without too great drop in the electro-motive force. This conductor C is heavily insulated with, for example, a good braided insulation, which insulation may be impregnated with pitch, rubber, or other moisture-resisting material, while the braiding itself is made hard and dense, so that it will resist great mechanical abrading action, while retaining its integrity as an insulator unimpaired. Thus if a bare wire *w* should be broken and fall upon the conductor C, and through any agency, as by the wind, be drawn backward and forward over it, producing a sawing action, the insulation of the conductor C would resist such sawing action and remain intact for a reasonable time.

E E′ E², &c., are ears depending from the conductor C and secured to the trolley-wire T in any suitable manner, as by soldering or clamping. These ears E E′, &c., are attached at sufficiently frequent intervals along the line to provide ample mechanical support and feeding-points for current to the trolley-wire T, and may be situated, say, six to eight feet apart. The span-wires W may be connected to the conductor C by suitable clamping devices, as at D, which may embrace such conductor C and thoroughly insulate it from the span-wire, the points of attachment to the conductor C being by preference about midway between the depending ears E E′, &c., so that a long insulating-surface exists between the bare metal at the clamps E E′ and the span-wire W. To afford still greater safety from leakage to earth or short circuits, additional insulation may be provided in the supporting devices D D.

In Fig. 2 is illustrated one of the ways in which the ears E E′ may be attached to the conductor C and the trolley-wire T. The conductor C may be bared of its insulation for a distance, the ear E, riveted or soldered in position or otherwise suitably secured thereto,

the attachment to the trolley-wire T being made in a similar manner. An insulating-tape may then be wound over the joint so made with the conductor C to restore the insulation at this point.

In Fig. 3 is illustrated a modification of the invention, in which two feeding, insulating, and supporting wires C C′ are used, which are connected to the trolley-wire T in the same way as seen in Fig. 2; but the ears must in this case also be covered with insulation between the conductors C C′ to prevent possible contact at this point with a fallen wire. The hooded support D is secured in like manner to both conductors C C′, as shown. The ears E and the hooded supports D are in this case, however, made in such a way as to brace the conductors C C′ and hold them at the proper distance apart. This arrangement is even better, so far as a shield for falling wires is concerned, than the arrangement, Fig. 1; but it is more expensive to construct and less sightly. It might, however, be employed to advantage in many instances—as, for example, where there are very many overhead wires belonging to telephone, telegraph, and other signaling systems.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an electric railway, of a main conductor having an insulating-covering and suspended above the roadway, and a bare contact-conductor placed beneath the said main conductor and carried by supports therefrom at points intermediate between the supports of the main conductor.

2. The combination, with a main supply-conductor for an electric railway, having an insulating-covering and suspended above the roadway by insulating-supports, of a bare contact-conductor placed beneath the said main conductor and supported therefrom by means of conducting attachments placed at points intermediate between the supports of the said main conductor.

3. The combination, in an electric railway, of a series of transverse supporting-wires, a main insulated conductor suspended therefrom by insulating-supports, and a bare contact-conductor connected by means of attachments to the said main conductor at points intermediate between the supports of said main conductor.

4. The combination, in an electric railway, of two insulated supply-conductors suspended above the roadway, and a bare contact-conductor suspended in a symmetrical position below the two supply-conductors and supported therefrom.

5. The combination, in an electric railway, of two main supply-conductors supported above the roadway, and a bare contact-conductor suspended in a symmetrical position between the two main conductors and electrically connected by attachments thereto at points intermediate between the supports of the said main conductor.

ELIHU THOMSON.

Witnesses:
JOHN W. GIBBONEY,
W. J. PLUMSTEAD.