(No Model.) 2 Sheets—Sheet 1.

R. H. GOULD.

SAFETY CONNECTION FOR ELECTRIC CONDUCTORS.

No. 451,377. Patented Apr. 28, 1891.

FIG: 1.

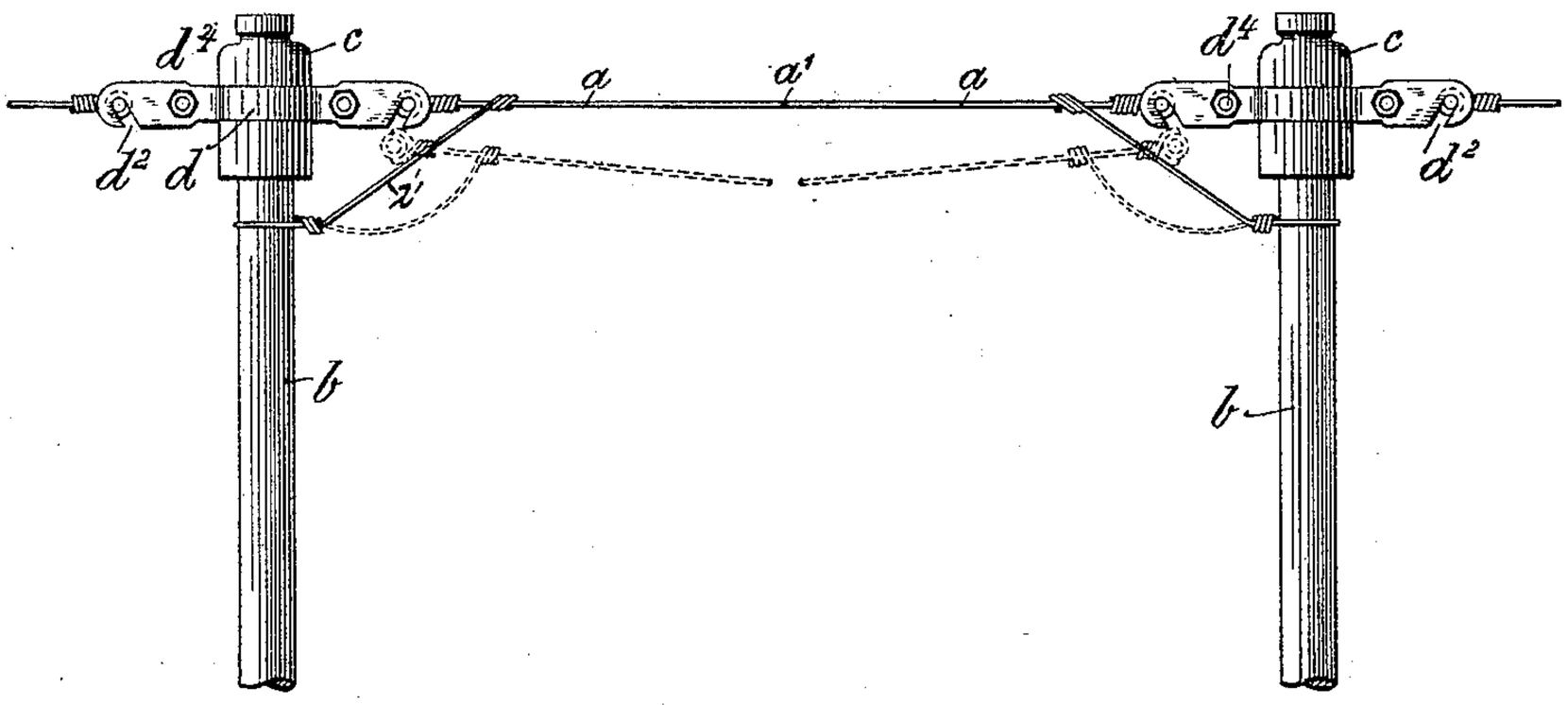


FIG: 2.

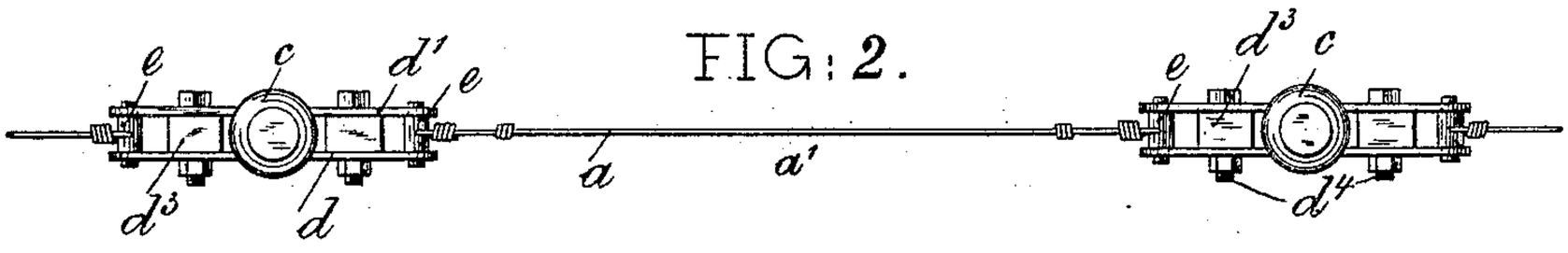


FIG: 3.

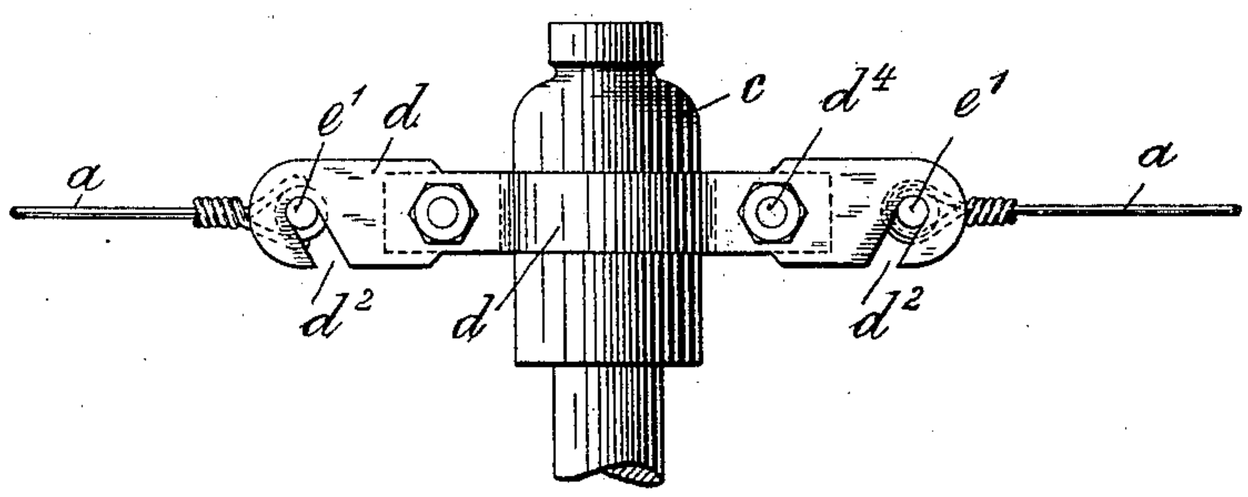
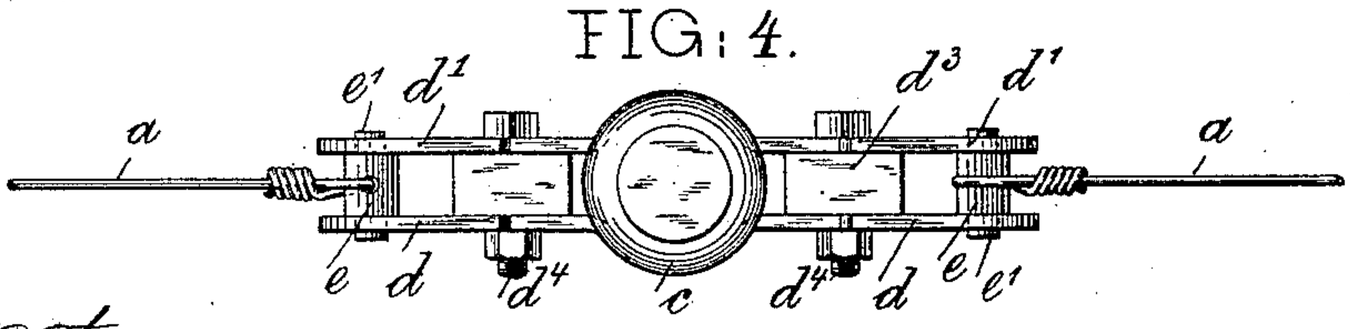


FIG: 4.



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(No Model.) 2 Sheets—Sheet 2.

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SAFETY CONNECTION FOR ELECTRIC CONDUCTORS.

No. 451,377. Patented Apr. 28, 1891.

FIG: 5.

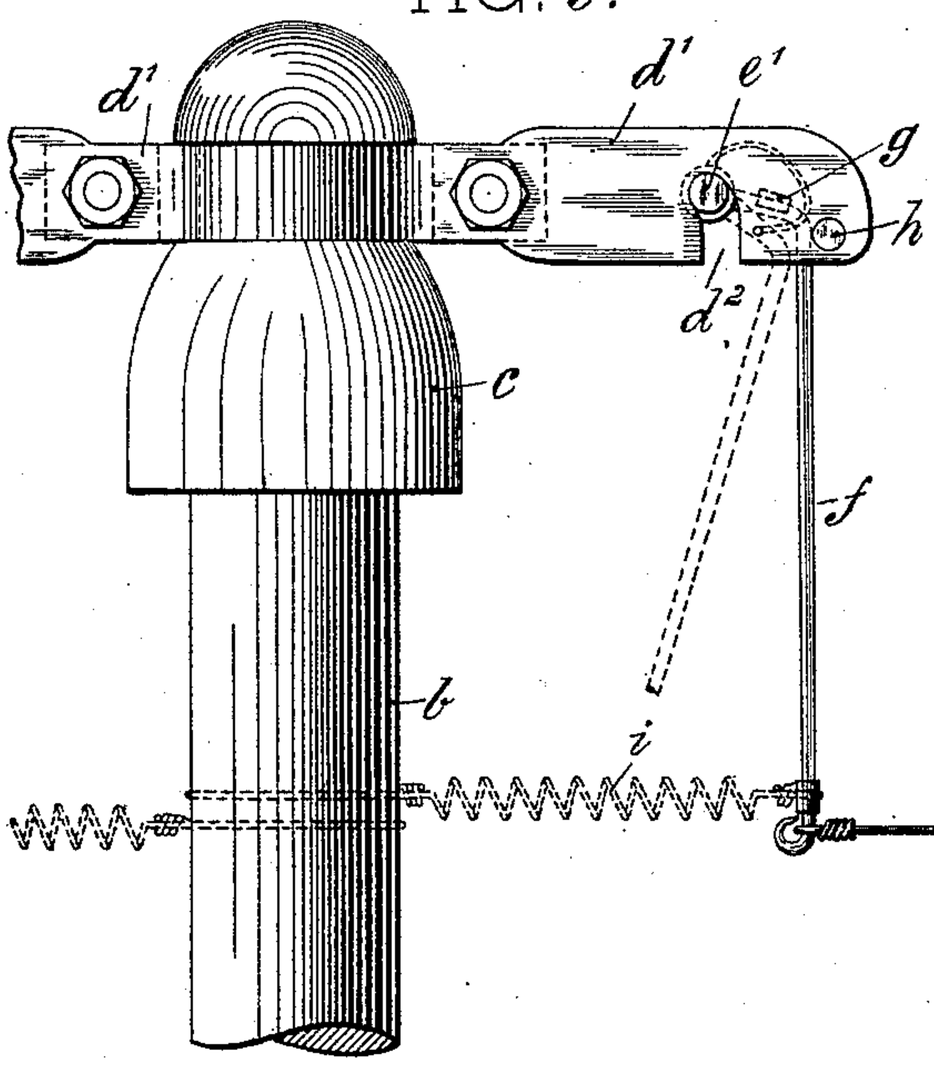


FIG: 6.

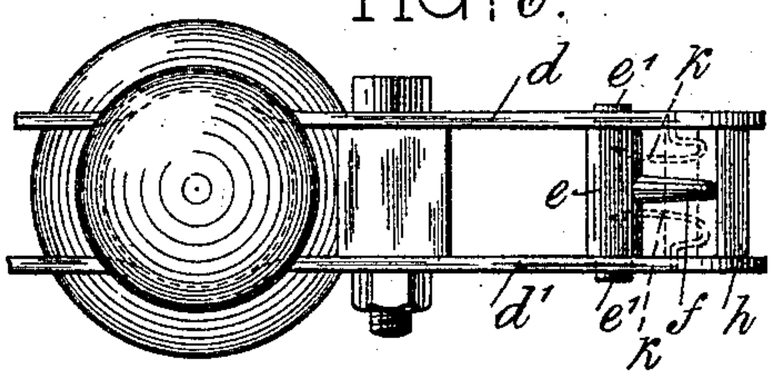


FIG: 7.

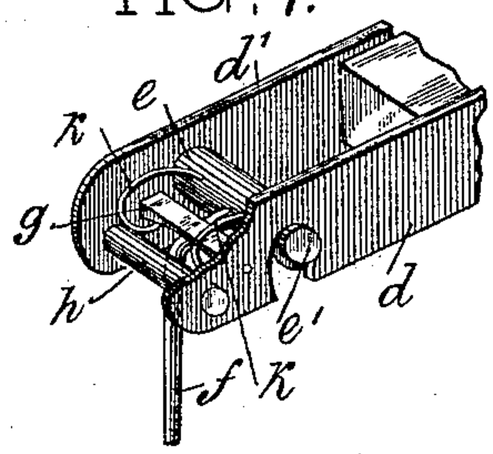


FIG: 8.

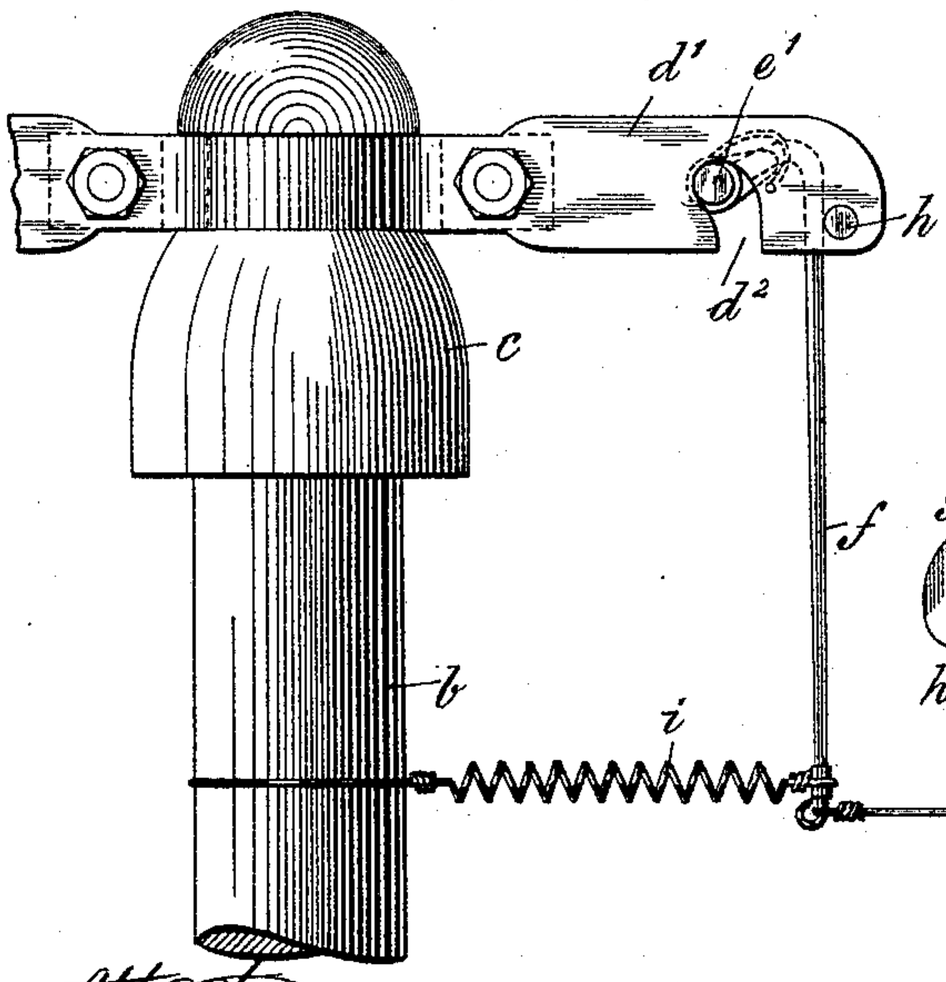


FIG: 9.

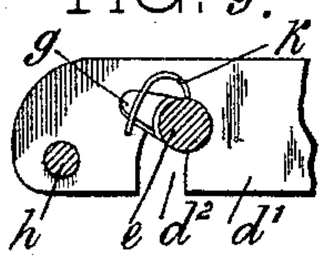
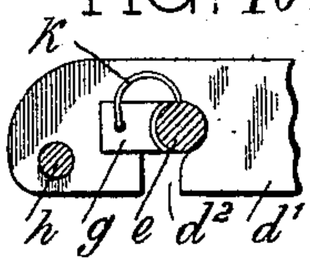


FIG: 10.



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UNITED STATES PATENT OFFICE.

ROBERT HOWE GOULD, OF BERLIN, GERMANY.

SAFETY CONNECTION FOR ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 451,377, dated April 28, 1891.

Application filed September 11, 1890. Serial No. 364,602. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HOWE GOULD, of the city of Berlin, Germany, have invented certain new and Improved Safety Connections or Couplings for Electric Conductors, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a safety connection or coupling for electric conductors, the object of said invention being to entirely interrupt the electric current between two carriers, standards, or posts by automatically interrupting or cutting out the connection between the said standards in case the wire should be broken or otherwise severed. A broken wire serving to conduct strong electric currents can prove excessively dangerous or even fatal when the depending end comes in contact with living creatures, so as to short-circuit the current to earth through the body of the living creature thus touched.

I will here chiefly consider the danger to human beings as being the most important, and would mention that the accident in question can happen in two different ways, viz: the broken end of the wire leading from the source of electricity—dynamo-machine—in falling down comes in contact with a passer-by, and, in addition to the injury caused by the sharp and whip-like recoil of a thick metal wire or cable stretched at high tension, the whole current would pass through that part of the person so struck to earth. In the second case, the end of the broken wire which does not lead from the dynamo falls down, and being still attached to the post would act mechanically in the manner before described, but would not do any mischief through electrical shock. Now according to my invention the possibility of transmitting current by contact with the depending wire is entirely prevented by the ends of the wire being automatically released from their connections, so that the conductor is cut out for the entire distance between two carriers or standards.

In the accompanying drawings, Figure 1 is an elevation of two standards with a wire stretched from one to the other, the broken wire fallen out of its connecting-clip being represented by dotted lines. Fig. 2 is a top view of Fig. 1. Fig. 3 is an elevation, and Fig. 4 a top view, of the automatic cut-out device in connection with an insulator, drawn on an enlarged scale. Fig. 5 is an elevation of a modification in which the conducting-wires are connected to automatically-detachable levers. Fig. 6 is a top view; Fig. 7, a perspective view of a part of the same. Fig. 8 is an elevation of another modification, showing a different manner of forming the electrical connection between the lever and the support. Figs. 9 and 10 are detail views of modified forms of the cutting-knife which severs the electrical connection.

The conductor *a* is, as customary with electric conductors, connected to the insulators *c c*. Should the conductor *a* break or become severed, for instance, at *a'*, Figs. 1 and 2, the two halves of the same will be released from their connections *d*, which are attached in appropriate manner to the insulators, for instance, by means of a suitably-formed clip *d* to *d'* or other attachment.

The aforementioned clips consist, preferably, of two rails *d d'*, bent in the middle to correspond with the form of the insulator, and provided near the ends with an inclined slot d^2, so as to form a kind of hook with the open slot directed downward. Two rails *d d'* are connected to each other by screw-bolts d^4 and suitable distance-pieces d^3, or in other suitable manner. The inclines of the slots d^2 run in opposite directions to the strain on the conductor, which is attached to small spindles or rollers *e*, the journals *e'* of which fit into the slots d^2 of the rails *d d'*; but it is not absolutely necessary that these spindles should be provided with journals, as they may simply consist of short pieces of copper, sheathed rod-iron or the like, of requisite dimensions.

According to the accompanying drawings, the conductor is either passed through a boring in the spindles or rollers or is laid around the same, the ends being, as customary, coiled onto the wire. The tension on the conductor *a* will cause the journals of the spindles or rollers *e* to remain in snug contact with the slots d^2 in the rails of the clip, so that in consequence of the electric connections through the conducting-rails *d d'* the current can flow without hinderance through the conductor or wires. If, however, a wire should break or

be severed from any cause, the tension on the wire would cease and the rollers or spindles *e* would fall by their own weight and the weight of the wire out of the slot d^2 in the rails *d d'* of the clip, so that the current would be instantaneously interrupted for the entire distance between the standards or posts *b b'*. There is another advantage connected with this sudden cessation of tension in the broken wire ends—viz., the dangerous and violent recoil is prevented. Thus my safety connection is useful for overhead wires which merely conduct currents of low tension, such as telegraph and telephone wires, &c.

In order that the automatically-released parts of the conductor falling out of the connection or coupling and the roller or connecting pieces *e* may be prevented from falling to the ground and thus causing injury, the same can be loosely attached by means of wire or other suitable material—for instance, with the standard or carrier—in such manner that when the connecting pieces or rollers are freed from their grip with the clips or couplings and the conductor is interrupted for the distance between the two standards or posts they will remain hanging to the latter without being in connection with the other part of the service.

In Figs. 5 to 7 the conductors are not connected immediately to the rollers *e;* but the latter are provided with bent lever-arms *f*, made of one piece with or firmly soldered into the said rollers and pressing against a bolt, spindle, or rivet *h*, which serves as a fulcrum for same near the tip of the rails *d d'*, and also tends to increase the conducting power of the attachment. The conductor *a* is attached to the lower end of the said lever-arm *f*, so as to exercise considerable power on the rollers for pressing the same onto the surface of the slots d^2 in the rails *d d'* of the clip and producing a snug contact betwen the parts. Should it, however, be found desirable to further secure contact between these surfaces, small pieces of copper or other foil or fine sheet metal, or a necessary quantity of any suitable combination of quicksilver with other metal amalgam, can be inserted between the surfaces of the roller and the slots in the rails of the clip before fixing the parts.

Should it be found desirable to still further increase the conducting power of my improved attachment, if after a time under climatic influences or by other reasons the surfaces of the slots d^2 or journals *e'*, or the rollers, should become oxidized, connecting-wires can be used, as represented in Figs. 8 to 10, shown also by dotted lines in Figs. 5 and 6, Fig. 8 being an elevation, while Figs. 9 and 10 represent two forms of severing device for severing the auxiliary wires *k k'*.

As represented in the aforementioned figures, the rollers *e* are not connected immediately with the conductor; but are each provided with a bent lever *f*, said lever carrying, when auxiliary wires are employed, a suitable cutter *g* for severing the said wire or wires *k k'*, and being at its lower end connected to the conductor *a*, and also to a helical spring *i*, fixed at its opposite end to the posts, standards, or carrier. When the parts are fixed in conducting positions, the conducting capacity of the device may, so long as the conductor is not broken or severed, always be preserved by auxiliary wires *k k'*, firmly soldered into the rails *d d'*, their other ends being soldered to the roller *e*, in order that the electric current can under no circumstances be impeded. These auxiliary connecting-wires *k k'*, in case of a breakage or severing of the conductor *a*, would tend to hold the rollers *e* or journals *e'*, fixed to the lever *f*, in the slot d^2 of the rails, thus maintaining the electric connection with the broken parts of the conductor and frustrating the object of my invention; but this is entirely avoided by the cutter *q*, lever *f*, and spring *i*, which operate as follows:

As soon as the conductor *a* is broken or severed from any cause the helical spring *i* will draw the lever toward the post or carrier *b*, thus causing the cutter *g* to sever the wires *k k'*, and thus releasing the rollers *e e*, so that the same with the lever *f* can fall out of the slots in the rails *d d'* of the clip. The spring *i*, being firmly attached at one end to the post or carrier, at the other end to the lever *f*, will prevent the latter with the part of the conductor from falling to the ground, so as to cause injury to any one. As will be seen from Figs. 5 to 10, the slots d^2 run in in opposite directions to those in Figs. 1 to 4 in consequence of the employment of the lever *f;* but if, instead of the lever *f* being arranged to depend from the device, as shown in the drawings, the same is arranged in the opposite position, so as to extend beyond the said device, the slots will have to be correspondingly reversed, or the lever can be provided with shorter depending arm with which the spring *i* would so gear that the longer arm would be caused to turn with the roller *e* away from the post before falling out of the slot.

I claim as my invention—

1. In combination with the support, as *b*, a clip, a conductor, and a detachable connection between the conductor and clip, consisting of the lever *f* and the roller attached thereto and engaging slots in the clip, substantially as described.

2. In combination with a support, as *b*, a clip connected thereto, a lever *f* between the conductor and the clip detachably connected to the latter, and a spring connected with the lever *f*, substantially as described.

3. In combination, the posts, the slotted clips, the spindles in said slots, the conducting-wire, the levers *f*, connecting the clips and the spindles with the ends of the wire, and a stop for holding the levers in position against the tension of the wire, substantially as described.

4. In combination, the posts, the clips hav-

ing slots, the spindles in the slots, the main conducting-wire in connection with the clips and spindles at its ends, the electrical connecting-wires extending from the spindles to form the electrical connection between the sections, and the knives for cutting said connection, operating when the spindles move, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ROBERT HOWE GOULD.

Witnesses:
FRED. J. DOWNING,
H. DUKER.