

(No Model.)

R. FURGANG.
SAFETY CUT-OUT.

2 Sheets—Sheet 1.

No. 480,009.

Patented Aug. 2, 1892.

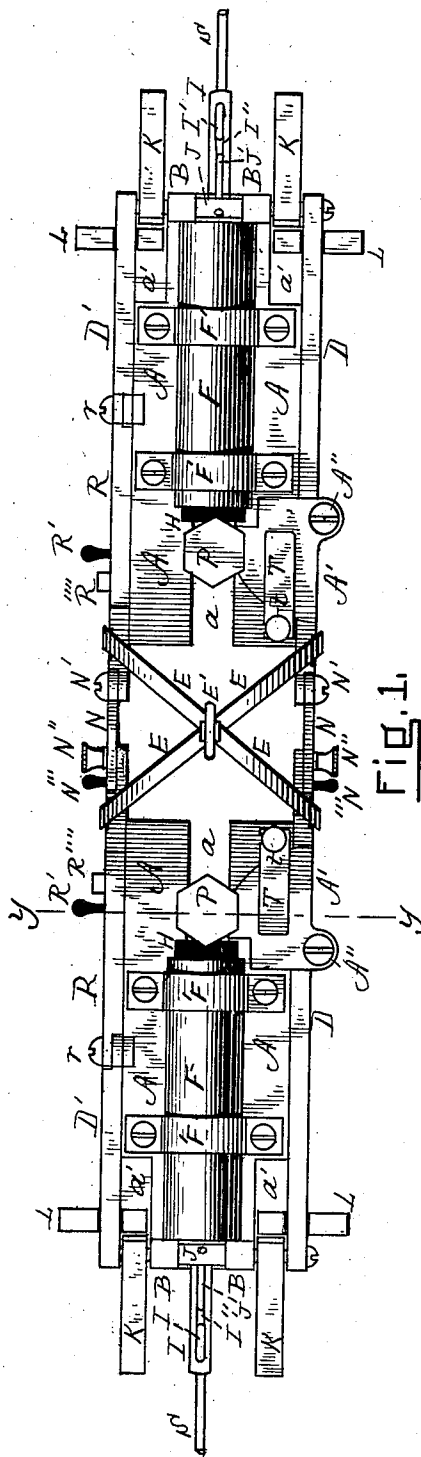


Fig. 1.

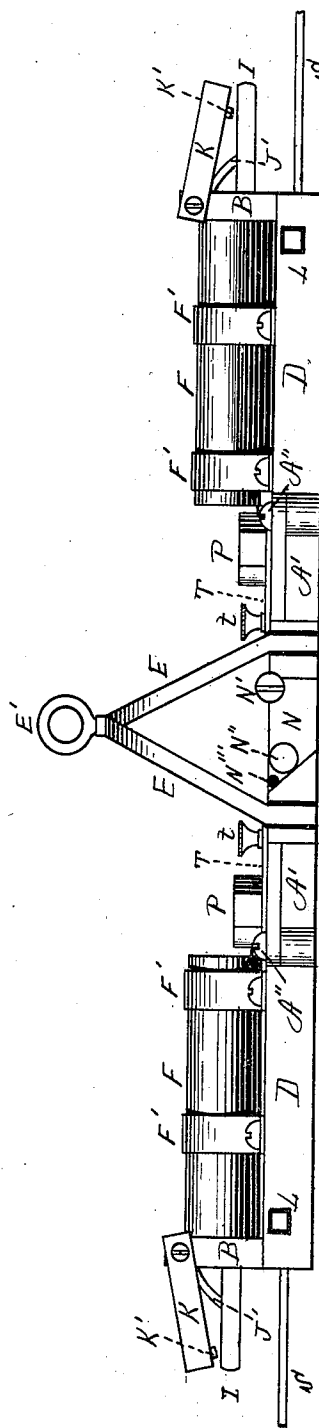


Fig. 2.

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(No Model.)

2 Sheets—Sheet 2.

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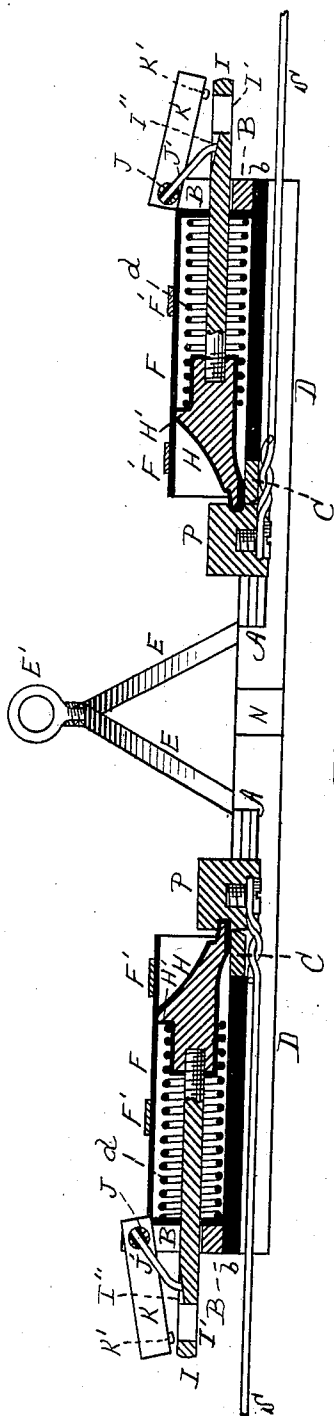


Fig. 3.

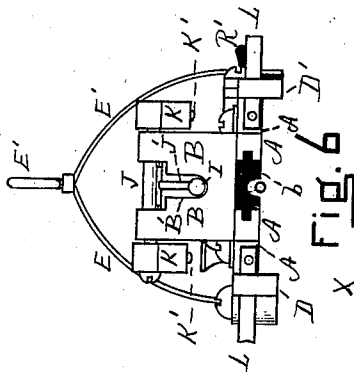


Fig. 6.

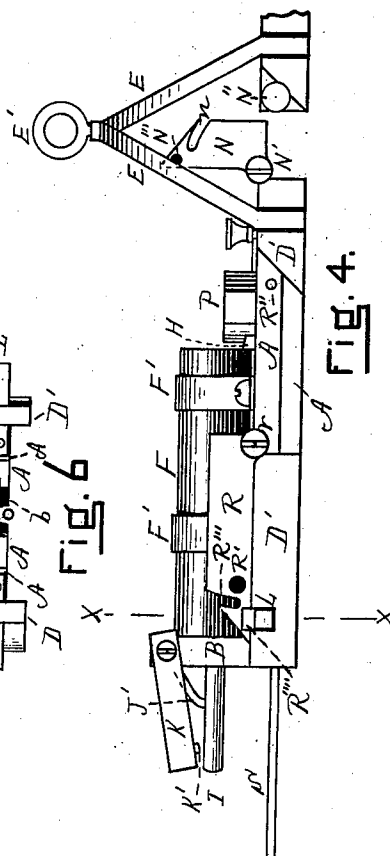


Fig. 4.

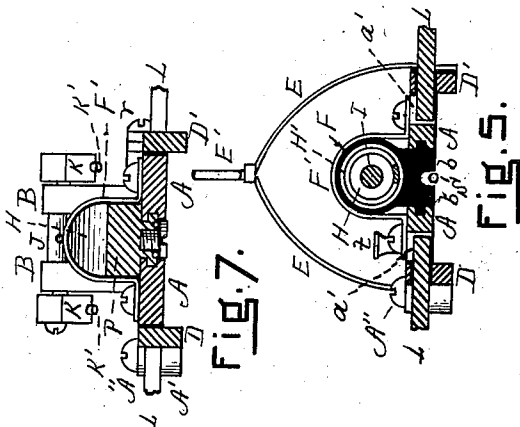


Fig. 5.

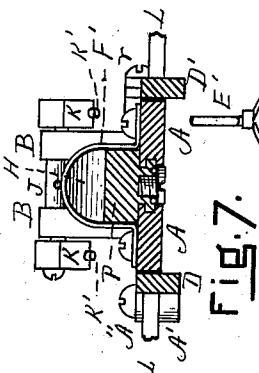


Fig. 7.

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UNITED STATES PATENT OFFICE.

RUDOLPH FURGANG, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO ISAAC KAFFENBURGH, OF SAME PLACE.

SAFETY CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 480,009, dated August 2, 1892.

Application filed October 14, 1891. Serial No. 438,707. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH FURGANG, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful
5 Improvements in Safety Attachments for Electrical Wires, of which the following is a specification.

This is a device intended particularly for application to electric-light wires or power-
10 wires for electric railways, whereby the end of a wire broken accidentally or cut intentionally—as by the fire department, for instance—is automatically and instantly insulated, thereby being rendered perfectly harm-
15 less in case it falls and comes in contact with any object or person, and also whereby a section of wire may be safely removed at will.

In the accompanying drawings, in which similar letters of reference indicate like parts,
20 Figure 1 is a plan view of my device with the parts in their usual or normal position, so that the electric current passes freely through it. Fig. 2 is a side elevation of the same. Fig. 3
25 is a central longitudinal vertical section. Fig. 4 is a view of the side opposite to that shown in Fig. 2, with the parts so arranged that a section of wire may be safely removed. Fig.
30 5 is a cross vertical section taken on line *x*, Fig. 4. Fig. 6 is an end elevation of the device. Fig. 7 is a cross vertical section on line *y*, Fig. 1.

A is a metallic plate or base made in two parts, said parts being separated by a central
35 longitudinal opening *a*, Fig. 3, and connected by the metallic end plate B, which extends up from the outer end of the plate, and the metallic cross-piece C, Fig. 1, which extends from one part of the plate to the other and is preferably integral with both. The inner
40 parallel edges of the parts of the plate A are lined with insulation *b*, Figs. 3, 5, and 6. Metallic side rails D D' are secured to the opposite side outer edges of this plate, and as the plate is cut away at *a'*, Figs. 1 and 5,
45 spaces are formed at these points. These side rails extend below the plate and when the device is used in connection with the power-wire of an electric railway serve as guards to prevent the trolley from jumping the wire.
50 These plates are made in duplicate, as shown,

and are supported centrally by an insulated frame E, which extends up from the adjacent ends thereof, said frame being surmounted by a ring or eye E' or other suitable device
55 by which the frame may be secured to and the plates sustained by the guard-wire or other convenient means of support.

F F are cylinders lined with insulation, secured centrally and longitudinally to the plates directly over the longitudinal openings
60 *a* by means of suitable straps F', the rear ends of said cylinders being placed against the end walls B and the front ends thereof being open. Within these cylinders are spiral springs *d*, covered with insulation and lying
65 between the rear ends of the cylinders and shoulders H' on the bolts II, Fig. 3. These bolts, which are covered with insulation, have screwed into them from the rear rods I, which
70 extend through the insulated rear ends of the cylinders and thence through suitable openings B' in the end walls B, Fig. 6, but without coming into contact with said walls, as shown. These rods are provided near their
75 outer ends with vertical holes I', Figs. 1 and 3, and inclines I'', leading to said holes. Shafts J have their bearings in the end walls B, and catch-pins J' extend centrally from said shafts (but being insulated therefrom) and lie
80 normally in the inclines I''. Rigidly secured to the opposite ends of said shafts are the metallic weights K, provided with the contact-points K'.

L L are metallic pieces extending from within the spaces *a'* through the side rails D D'
85 and insulated therefrom, as shown, and to these pieces may be secured ground-wires. The plates A are connected centrally beneath the frame E by metallic gates N, which are hinged at N' to the rails D D' and can be
90 swung up and back at will by means of the insulated handles N''. These gates may be locked, when closed, by means of the screws N'', which extend through the openings *n* in the gates.

S S are the electric wires, their inner ends
95 being secured to metallic blocks P. The normal position of the apparatus is as shown in Figs. 1, 2, and 3. The blocks P are held by the taut electric wires S snugly against the
100

small ends of the bolts H, suitable grooves or recesses being provided in the blocks P to prevent them from slipping. The blocks force the bolts H back against the power of the springs until said blocks rest against the cross-pieces C, integral with the metallic plates A. Thus the current is free to pass from one wire S to its block P, thence to a plate A, thence through the metallic gates N to the other plate, and thence through the other block to the other wire S. Now should either of these wires become broken between this apparatus and the next apparatus (there being several on the wire) or between this apparatus and the next point of support for the wire the wire would of course instantly lose its tautness and the bolt H on the side next the break would by means of the spring *d* throw the block P, with the broken end of the wire, forward, and it would drop out of the apparatus through the open space between the two parts of the apparatus beneath the frame E. Of course this broken wire, which would thus fall to the ground, would be dead and harmless. When the bolt H flies forward, it carries with it the rod I, and the catch-pin J' slips by gravity from the incline I' and drops into the hole I', thus preventing the bolt from flying entirely out of the cylinder. At the same time the weights K, which are fast on the same shaft as the catch-pin J', swing down by gravity, aiding the motion of the catch-pin and swinging into the spaces *a'* and by means of the contact-points K' striking and lying against the metallic pieces L, to which the ground-wires are secured, thus allowing the electricity from the live wire secured to the other end of the apparatus to pass through its block P and the frame A at that end to the gates N, and thence to the frame A at the end of the apparatus next the break, and thence through the weights K to the pieces L and to the ground-wires secured to said pieces. If a section of the wire is cut instead of being accidentally broken, the effect is of course the same.

On one side of each frame A the rail D' is cut away to allow of the insertion of the metallic latch R. This latch is hinged at *r* to the rail D' and provided with the insulated handle R' and also with the opening R'', Fig. 4, which drops over a pin R'', secured to the frame A. A contact-piece R''' serves when the latch is thrown back, as shown in Fig. 4, to make connection with the piece L. On the opposite side of each frame A, next the open end of the cylinder F, a portion A' of the frame is hinged to the main portion of the frame at A''. By the removal of a screw *t*, which extends through a slotted locking-piece T, rigidly secured to the surface of the swinging portion A', this portion or gate may be swung out horizontally, so that access can readily be had to the block P. Now in case a section of wire between two of my apparatus is desired to be removed—as in case of a fire, for instance—the gates N are raised, thus disconnecting the two parts of the apparatus, and the latch R

between the section desired to be removed and the source of electricity is raised and swung back into contact with the piece L, thus conducting the electricity to the ground-wire. Then by swinging out the gate A' the block P can easily be removed and with it the section of wire connecting it to the next apparatus. The other end of this section of wire is of course removed by similarly operating upon the nearest end of the next apparatus. The space between the two parts of my device—i. e., the space under the frame E—is so small that a trolley will easily jump it.

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

1. In a safety attachment for electrical wires, the plate A, of conductive material and provided with the spaces or openings *a'*, end pieces B, and swinging weights K, held normally up, as described, the ground connections L, the bolt H and spring *d* within the cylinder F, and the block P, to which the end of the wire is secured, combined and arranged substantially as set forth.

2. In a safety attachment for electrical wires, the plate A, of conductive material, cylinder F, spring *d*, end piece B, rod I, provided with the perforation I', shaft J, sustained by the said end piece, and catch-pin J', whereby when the spring is released the bolt is checked in its outward movement, substantially as described.

3. In a safety attachment for electrical wires, the pair of plates A A, of conductive material, a supporting insulated frame, as E, conductive gates, as N, capable of being opened to destroy the connection, bolts and springs sustained by said plates, and blocks, as P, to which the ends of the electric wire are secured, said blocks being held against the bolts by the tension of the wire, whereby the breaking or cutting of a wire releases the spring on that side, thus causing the bolt to throw out the block to which the broken or cut wire is secured and drop it through the central space between the two plates, substantially as set forth.

4. In an apparatus of the character described, the combination of the plates A, of conductive material, ground connections L, and latches R, of conductive material, arranged, as described, to swing back into contact with the said ground connections, substantially as set forth.

5. In an apparatus of the character described, the combination of the plates A, of conductive material, bolt H, and spring *d*, block P, to which the end of the wire is secured, and outwardly-swinging gate A', whereby access may be had to the said block, substantially as described.

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Witnesses:

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