

(No Model.)

M. KERSTEIN.

DEVICE FOR AUTOMATICALLY INSULATING BROKEN WIRE.

No. 438,814.

Patented Oct. 21, 1890.

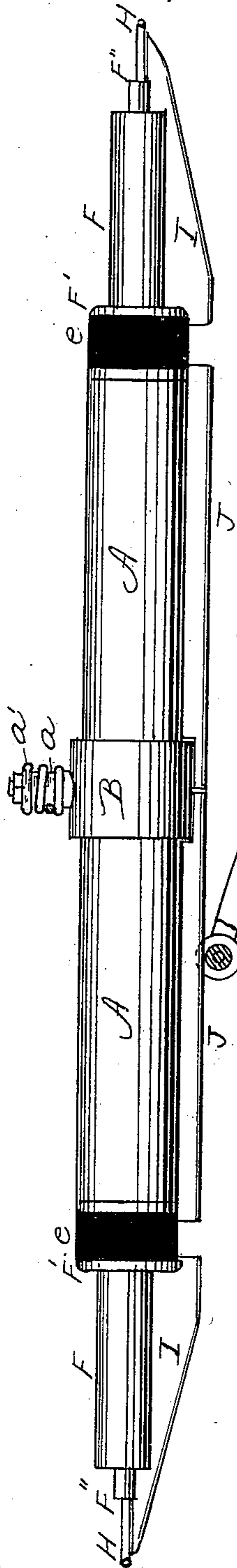


FIG. 1.

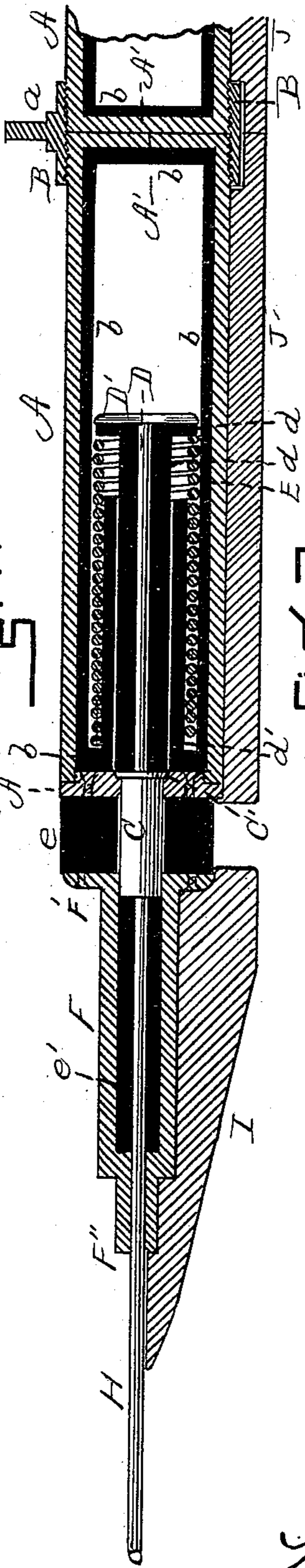


FIG. 2.

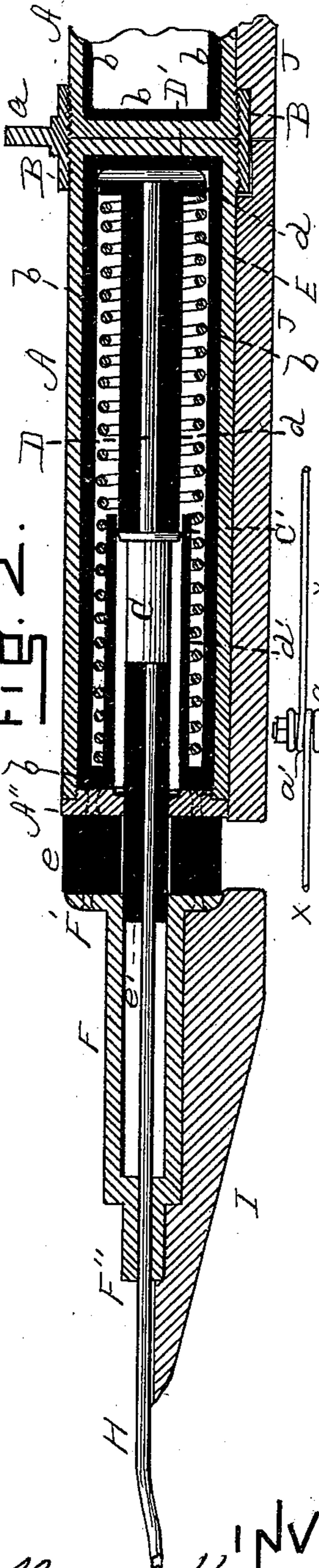


FIG. 3.

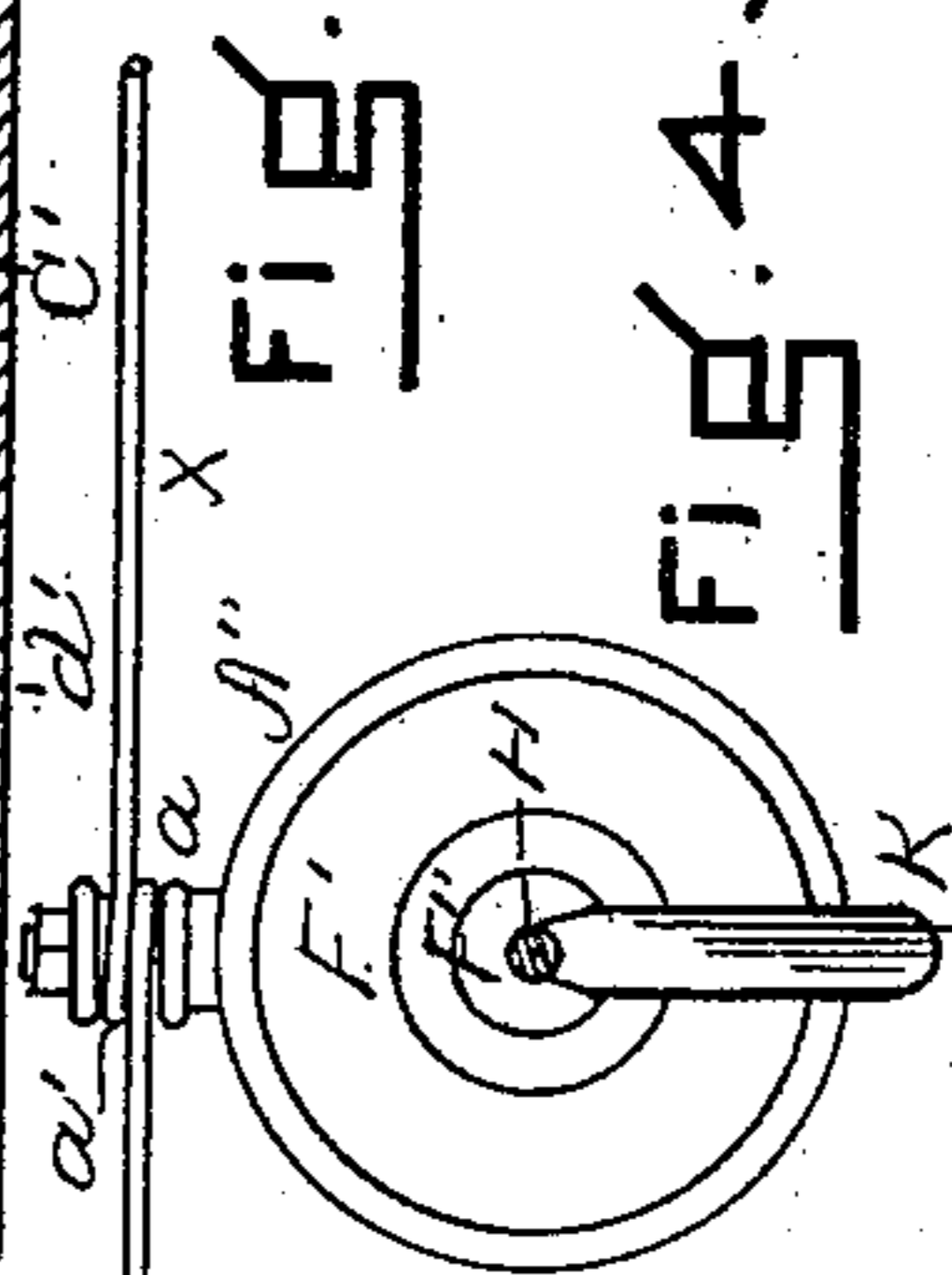


FIG. 4.

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MAX KERSTEIN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO
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DEVICE FOR AUTOMATICALLY INSULATING BROKEN WIRE.

SPECIFICATION forming part of Letters Patent No. 438,814, dated October 21, 1890.

Application filed July 14, 1890. Serial No. 358,685. (No model.)

To all whom it may concern:

Be it known that I, MAX KERSTEIN, a subject of the Emperor of Germany, residing in Boston, in the county of Suffolk, and State of Massachusetts, have invented a new and improved Device for automatically Insulating a Broken Wire in an Electrical Circuit, of which the following is a specification.

This is a device intended for application to an electric wire—such as a power-wire for an electric railway, an electric-light wire, &c.—whereby on the accidental breakage of such wire the broken end will be instantly and automatically insulated, thus rendering it harmless in case it should fall upon another wire or any object or person.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a side elevation of my device as applied to an electric wire such as is used in connection with an electric railway operated by the so-called "overhead" or "trolley" system. Fig. 2 is an enlarged longitudinal vertical section of one of the two similar operative portions of the same. Fig. 3 is a similar view with the device in the position assumed when the wire has become broken and is insulated by the operation of the device. Fig. 4 is an end elevation of the device.

A A represent two exactly-similar cylindrical boxes made of conductive material, whose rear ends A' A' are held together in any desired manner, the method shown consisting of their being screwed into a ring B, internally provided with a right and left screw. This ring not only holds the boxes together but supports them, being itself supported by the supporting-wire x , Fig. 4, or other device, by means of the glass insulator a , around which is twisted the wire a' , leading to the supporting-wire x of an electric railway. The boxes A may be supported by any practicable attachment either from a wire or post or other suitable device.

A'' represents the front end of the box A, and the entire box is lined with rubber or other insulating material b . The front end A'' is centrally perforated to receive a cylindrical block or piston C, of conductive mate-

rial, which lies normally in the position shown in Fig. 2, and is provided with a flange C', whereby it is prevented from being pulled out of the end A'' of the box. A metallic rod D extends from the piston C horizontally into the box and is provided with a head D', while a spiral spring E surrounds the piston-rod between the head D' and the end A'' of the box, said spring being insulated from the box by the insulation b and from the piston, piston-rod, and head by the insulation d , secured to them, and the insulation-tube d' .

F is a tubular metallic guide-box provided with a flange F' at its rear end, between which and the box A is a mass of insulation e . The piston C extends normally from the end of the box A through the insulation e and into the guide-box F, and from the outer end of said piston extends a wire H, surrounded with insulation e' , said wire extending through a suitable perforation in the outer end F'' of the guide-box. This wire is integral with the piston C and is the true wire on the circuit—i. e., the power-wire—or is brazed or otherwise secured thereto.

When this device is to be placed at suitable intervals on the wire in circuit for supplying electrical power to an electrical railway by means of a trolley, a graduated track I is secured to the underside of the guide-box F, by means of which the trolley K may be conducted down to the under side of the box A, where, after jumping the space under the insulation e , it finds another track J, secured to said box.

In operation, the device, being placed at suitable intervals along the line, when no breakage has occurred is as shown in Fig. 2, the electric current passing from the wire H through the piston C and the boxes to the wire at the other end of the apparatus. In case the wire H breaks, the spring, which has been contracted by the pull of the wire upon the piston, instantly expands and pulls back the piston by means of the rod D and head D', so that the piston C and wire H are in the position shown in Fig. 3, and are insulated by the insulation $e e' b$ from the box, thus rendering the wire harmless from the apparatus

to the broken end. Hence if the broken end should fall on another wire or on any person no harm would ensue.

Of course an electric-light wire would not need the parts I J.

It is not absolutely necessary that there should be two boxes A secured together; but it is advisable that such should be the case, in order that a breakage on either side of the device may be provided for when the apparatus is secured to a wire between posts.

The tubular box F serves both as a support and a guide for the wire.

The insulation *e* may be secured to the box end A'' and the flange F' by screws or in any suitable manner.

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

1. The herein-described device for automatically insulating a broken wire in an electrical circuit, comprising the following parts, viz: a box or case, as A, of conductive material, a piston C, of conductive material, from which the electric wire extends, said piston being normally electrically intermediate with said wire and box, a piston-rod D and spring E, and suitably-distributed insulating material, whereby when breakage of the wire oc-

curs the piston is withdrawn by the spring into the box and the piston and wire insulated from said box, substantially as set forth.

2. The combination of the box A, provided with the perforated end A'' and lined with insulating material *b*, the insulation-tube *d'*, the spring E, piston-rod and head D D', protected by insulation *d*, the piston C, and wire H, protected by insulation *e'*, substantially as described.

3. The combination of the box A, provided with the perforated end A'' and lined with insulating material *b*, the insulation-tube *d'*, the spring E, piston-rod and head D D', protected by insulation *d*, the piston C, tubular guide F, separated from the box A by insulation *e*, and the wire H, protected by insulation *e'* and extending through said guide to the said piston, substantially as set forth.

4. The combination of the box A, provided with the track J on its under side, and the guide F, provided with the graduated track I on its under side, substantially as and for the purpose described.

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Witnesses:

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