

J. ERICKSON.
 LINE PROTECTIVE DEVICE.
 APPLICATION FILED FEB. 14, 1912.

1,113,319.

Patented Oct. 13, 1914.

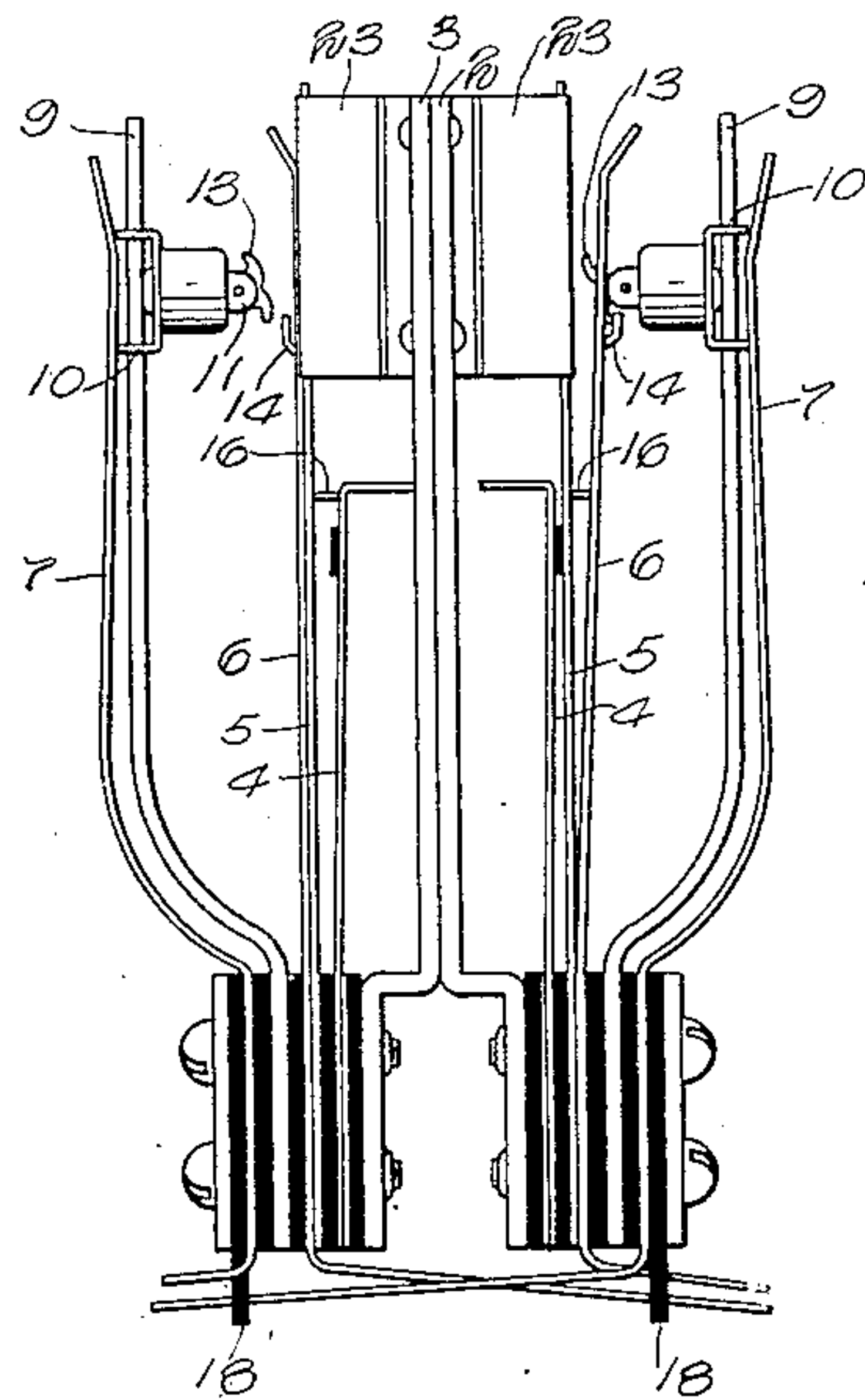


FIG. 1.

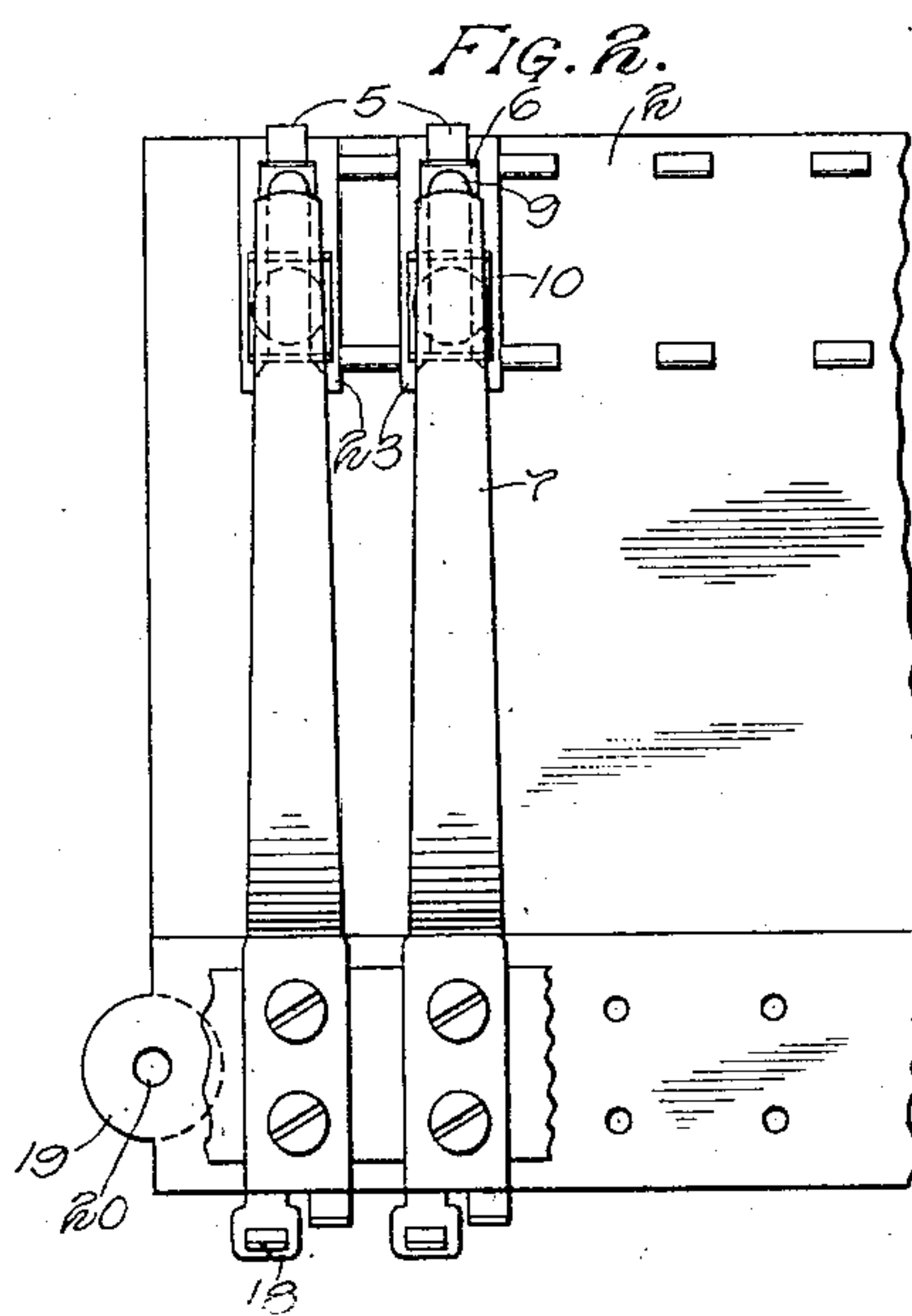


FIG. 2.

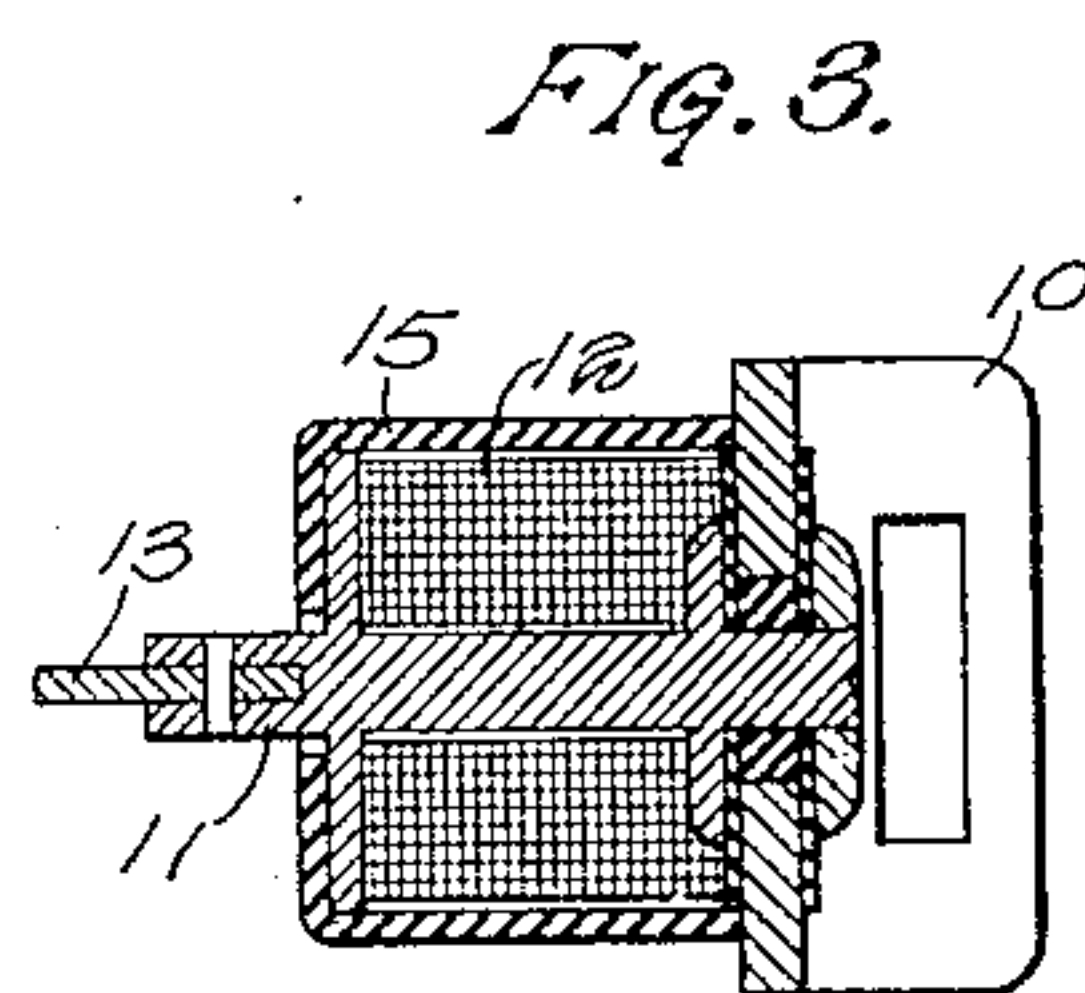


FIG. 3.

WITNESSES
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UNITED STATES PATENT OFFICE.

JOHN ERICKSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO AUTOMATIC ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LINE PROTECTIVE DEVICE.

1,113,319.

Specification of Letters Patent.

Patented Oct. 13, 1914.

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To all whom it may concern:

Be it known that I, JOHN ERICKSON, a citizen of the United States of America, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Line Protective Devices, of which the following is a specification.

My invention relates to line protective devices, and more particularly to that class of protective devices which employ heat coils for operating the same.

My invention is in the nature of an improvement upon the line protective device shown and described in my co-pending application Serial Number 661,787, filed November 22, 1911.

My present invention differs from my previous invention in that I employ a self-soldering heat coil, and, furthermore, I provide improved means for mounting this heat coil, whereby it is held firmly against rotation.

These and other objects of my invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of a pair of the protective devices mounted upon opposite sides of a mounting plate. Fig. 2 is a side elevation of a portion of the mounting plate showing two of the protective devices mounted upon the same side of the plate. Fig. 3 is a sectional view of the heat coil.

The mounting plate is composed of two plates 2 and 3 riveted together. Mounted upon each side of the mounting plate there are a plurality of groups of flexible contact springs 4, 5, 6 and 7 and stiff heat coil supports 9. The two sets of springs which are mounted opposite each other preferably form a pair belonging to the two sides of the same line circuit. Ordinary carbon lightning arresters 23 are clamped between the spring 5 and the mounting plate, which is ordinarily grounded. The spring 4 is mounted next the mounting or ground plate and may be used to close an alarm circuit when pressed into contact with said plate. The spring 5 is a stationary spring, its function being to hold the carbon lightning arrester in place and to furnish a connection between the spring 6 and the lightning arrester. The spring 6 is the line spring—that is, the spring which is connected to the outside line. The spring 7 is the switch-

board spring—that is, the spring which is connected to the switchboard inside the central office. Electrical connection is normally maintained between the springs 6 and 7 by means of a heat coil which is mounted upon the support 9. This heat coil comprises a U-shaped member 10 to which there is insulatingly secured a pin 11 around which there is wound a coil of resistance wire 12. A protecting shell 15 is slipped over the winding 12. One terminal of the winding 12 is connected to the member 10 and the other terminal is connected to the pin 11. The limbs of the U-shaped member 10 are provided with rectangular openings which may be slipped down over the end of the support 9. The end of the pin 11 is provided with a slot in which there is pivoted a lever 13. A small quantity of solder is placed in the slot in which the lever 13 is mounted to hold it rigid. Near the top of the spring 6 there is a small lug 14, immediately above which there is an opening through the spring.

The protective device is set in the following manner: The U-shaped member 10 of the heat coil is slipped down over the top of the support 9 and the spring 6 is forced outward until the lower end of the lever 13 may be slipped down behind the lug 14, as shown on the right-hand side of the mounting plate in Fig. 1. When the device is thus set there is a connection from the switchboard spring 7 through the member 10, winding 12, pin 11, lever 13 and the lug 14 to the line spring 6. When an abnormal current flows over this circuit for an undue length of time, the winding 12 heats up and softens the solder sufficiently to allow the lever 13 to be tipped up by the spring 6 and release it. When the spring 6 is released it assumes the position shown on the left side of the mounting plate in Fig. 1 and becomes disconnected from the switchboard spring 7. In this position a lug 16 on the spring 6 passes through an opening in the spring 5 and forces the spring 4 down onto the ground plate, thereby grounding the line spring and closing the alarm circuit. When a heat coil is operated to release the spring 6, the lever 13 is shifted from the position shown on the right hand of the mounting plate to that shown at the left of said plate, and the solder, upon cooling, secures the lever in its new position. In order to reset the device

it is only necessary to remove the heat coil from the support 7, turn it over and replace it so that the outward turned end of the lever 13 will be down and in position to again engage the lug 14 in the spring 6.

The rear terminals of all the line springs 6 on one side of the mounting plate and of all the switchboard springs 7 on the other side are crossed over to the opposite side, so as to bring all the line terminals on one side and all the switchboard terminals on the other side. The crossed-over terminals are passed through openings in the insulating washers 18 to stiffen them.

The switchboard spring 7 is not rigidly connected with the heat coil support 9, but simply bears against it by its own tension. The ordinary test plug may thus be inserted between the spring 7 and the support 9, thereby disconnecting the line from the switchboard, so that the line may be tested either in or out as desired.

The rear portions of the mounting plates 2 and 3 are offset so as to make the rear portion of the mounting plate approximately of the thickness of the lightning arresters. The mounting strips are generally long enough to carry ten or twenty pairs of the protectors. At each end of the strip one of the plates 2 or 3 is provided with a semi-circular projection 19, while the other plate is provided with a corresponding semi-circular cavity or notch. At one end of the strip the lug is in the plate 2 and at the other end in the plate 3. A number of the strips may thus be placed end to end and a lug on each strip will fit into a notch in the adjacent strip, and a bolt may be passed through the holes 20 in the two plates, thus forming a rigid connection between the two.

While I have illustrated my invention in connection with one specific structure, it is to be understood that in certain aspects my

invention is of broader scope, and that I do not wish to be limited to the exact construction shown and described.

What I claim as my invention is:—

1. In a line protective device, a supporting arm, a heat coil having a U-shaped plate connected to one end of said coil, and a pair of openings in said plate through which said supporting arm is adapted to pass in order to secure said heat coil to said arm.

2. In a line protective device, a supporting arm, a heat coil having a U-shaped plate connected to one end of said coil, and a pair of angular openings in said plate through which said supporting arm is adapted to pass in order to secure said heat coil to said arm.

3. In a line protective device, a supporting arm, spring members mounted upon said arm, a heat coil, a U-shaped member connected to said heat coil and provided with rectangular openings in its end portions through which said supporting arm is adapted to pass, whereby said heat coil is firmly secured to said supporting arm.

4. In a line protective device, a ground plate, spring members suitably mounted thereon, a heat coil normally engaged by one of said spring members, said heat coil having a trigger provided with a pair of catches, and a lug carried by one of said spring members and engaging one of said catches, said heat coil being removable, whereby it may be turned over, said lug being adapted to engage the other catch when the heat coil is so turned.

Signed by me at Chicago, Cook county, Illinois, this 9th day of February, 1912.

JOHN ERICKSON.

Witnesses:

ARTHUR J. RAY,
ALBERT ANDERSEN.