(No Model.)

F. S. PEARSON.

LIGHTNING ARRESTER.

No. 526,736. Patented Oct. 2, 1894.

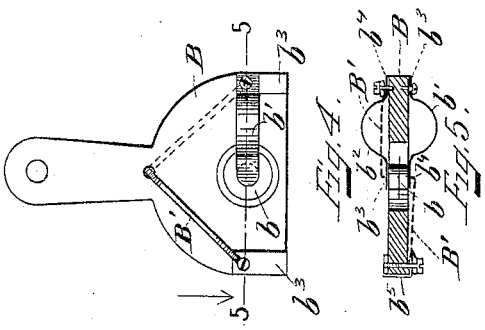

Fig. 4.

Fig. 5.

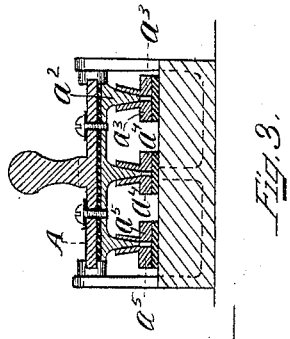

Fig. 3.

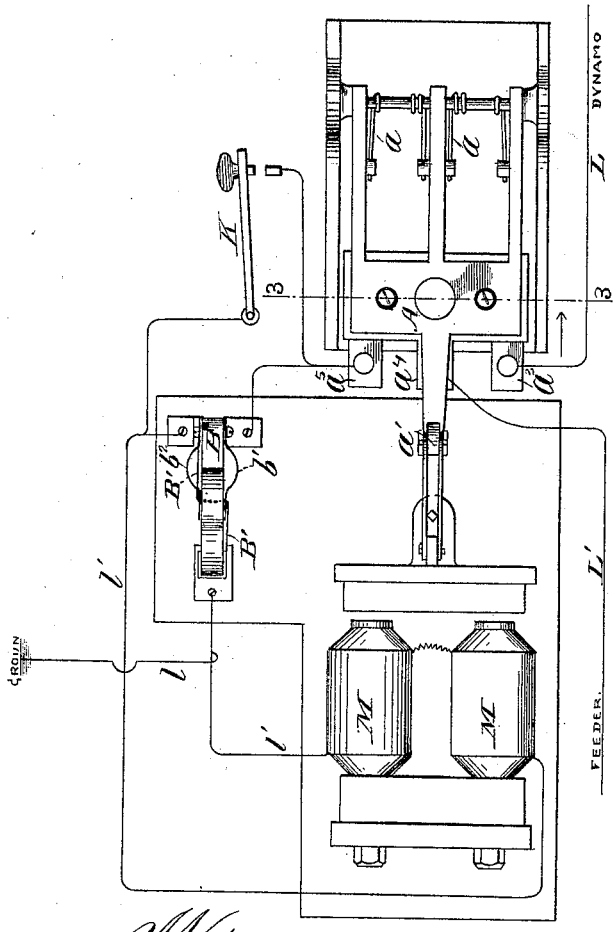

Fig. 1.

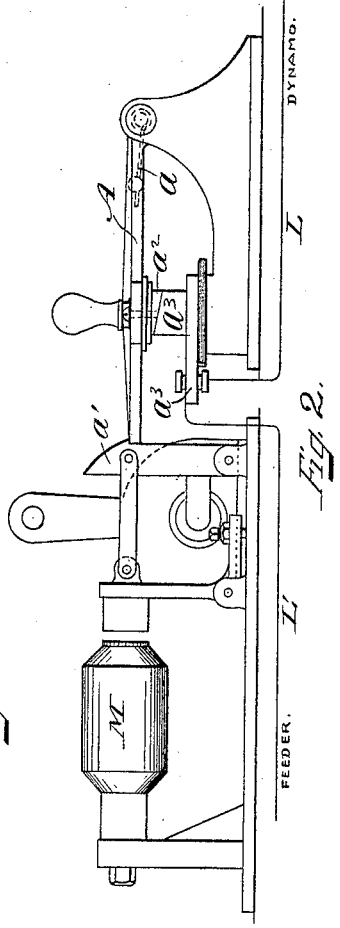

Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

FRED S. PEARSON, OF BOSTON, MASSACHUSETTS.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 526,736, dated October 2, 1894.

Application filed September 7, 1891. Serial No. 404,989. (No model.)

To all whom it may concern:

Be it known that I, FRED S. PEARSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Lightning-Arrester, of which the following is a specification, reference being had to the accompanying drawings, making a part hereof, in which—

Figure 1 is a plan and Fig. 2 an elevation of one form of my apparatus. Fig. 3 is a detail of the yoke and electrodes of the switch; Figs. 4 and 5, an elevation and section of the main part of the arrester detached.

It is well known that atmospheric electricity will at times cause a difference of potential in an electric circuit so great as to injure the insulation; and a variety of apparatus has been devised to prevent this. My invention relates to this class of apparatus and consists, mainly, in the combination of a lightning arrester with a switch controlled by an electro-magnet, the current between the electrodes of the arrester energizing the magnet which opens the switch and breaks the circuit that is the main circuit and also the branch circuit when a current is established through the electrodes of the arrester. In order to make such an apparatus thoroughly practical, it is necessary that the arrester and fuse be readily removed and replaced; and another feature of my invention consists in an arrester with terminals on a block of non-conducting material, adapted to be readily removed from and replaced upon the contact points on the base of the apparatus, with a fuse joining the main terminals, and a pair of electrodes separated as by a thin sheet of non-conducting material, adapted to be ruptured when the electro motive force exceeds the desired amount.

In the drawings, A is a lever actuated by the springs a, and held in position by the detent a'; so that when the detent a' is released by the magnet M, the springs a will carry the yoke a^2 out of contact with the electrodes a^3 a^4 a^5 and break the main circuit L L', through electrodes a^3 a^4 and yoke a^2, and the branch circuit through electrode a^5 to ground. The electro-magnet M and switch composed of the lever A, springs a, detent a', yoke a^2 and electrodes a^3 a^4, are too well known to require further description.

In the drawings, L represents the wire of a dynamo and L' one of the feeders, of which in practice there may be several, as will be clear.

The yoke a^2 has a third member making contact with the electrodes a^5, so that normally the electrodes a^3 a^4 a^5 are at the same potential and this potential is not sufficient to cause a current through the branch circuit to ground because that circuit is broken by the non-conducting material b between electrodes b' b^2, which connect respectively with the terminals b^3 b^4 of the arrester B. Consequently, so long as the potential of electrodes a^5 and b' b^2 does not exceed a certain amount, there will be no current through the branch circuit; but in case (by reason of the great potential induced by lightning, or for any other reason,) the potential of electrodes a^5 and b' b^2 exceeds the desired amount, a discharge will take place between terminals b' b^2, puncturing or destroying sheet b; and hence current will flow through fuse B' from terminal b^4 to terminal b^5 to ground; the self induction of the coils of magnet M compelling such a current to flow through the part of the branch circuit of which fuse B' forms a part rather than through the other branch l'. This induced current is probably momentary, but as soon as the current, for any reason, breaks through paper sheet b or other non-conductor between b' and b^2, a current from the dynamo will be established through terminal b^3, electrodes b' b^2, terminal b^4, fuse B' and conductor l, until the fuse melts, if it be not already melted; and thereafter through terminal b^3, electrodes b' b^2, terminal b^4 conductor l' and magnet M; but this current energizes magnet M, which releases the detent and breaks the branch circuit; also breaking connection between feeder L' and bus wire L.

The key K is used as a ready means of operating the circuit breaker by hand.

It will now be clear that the main feature of my invention is the combination of the main circuit and a branch circuit by means of a lightning arrester and an electro-magnet controlling a circuit breaking switch, so that as soon as a current is established, by a large increase of potential, through the electrodes of the arrester, the main circuit and also the

branch circuit are broken; but a second feature of my invention consists in doing this in connection with a fuse which forms a part of the branch circuit until melted, when the branch circuit is through the coils of the electro-magnet which releases the detent and opens the switch. As this fuse must be replaced, I make the arrester so that it can be readily taken from the base of the apparatus, in order to put in a new fuse, and a new sheet of non-conducting material, when paper is used; and when replaced will be properly connected with the contacts on the base; and this combination of a lightning arrester and fuse on the same block, provided with terminals adapted to engage with contact points on the base, is also a feature of my invention.

What I claim as my invention is—

1. In combination, a lightning arrester; a switch; its detent; an electro-magnet; a main circuit; and a branch circuit which contains the arrester and the electro-magnet; and which is connected by the switch with the main circuit; all operating to break the main circuit and the branch circuit when current flows through the arrester, substantially as described.

2. In combination a lightning arrester; a switch; its detent; an electro-magnet; a fuse; a main circuit; and a branch circuit with two branches, one branch containing the arrester, and the electro magnet in series, and the other the fuse, all substantially as described.

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Witnesses:
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