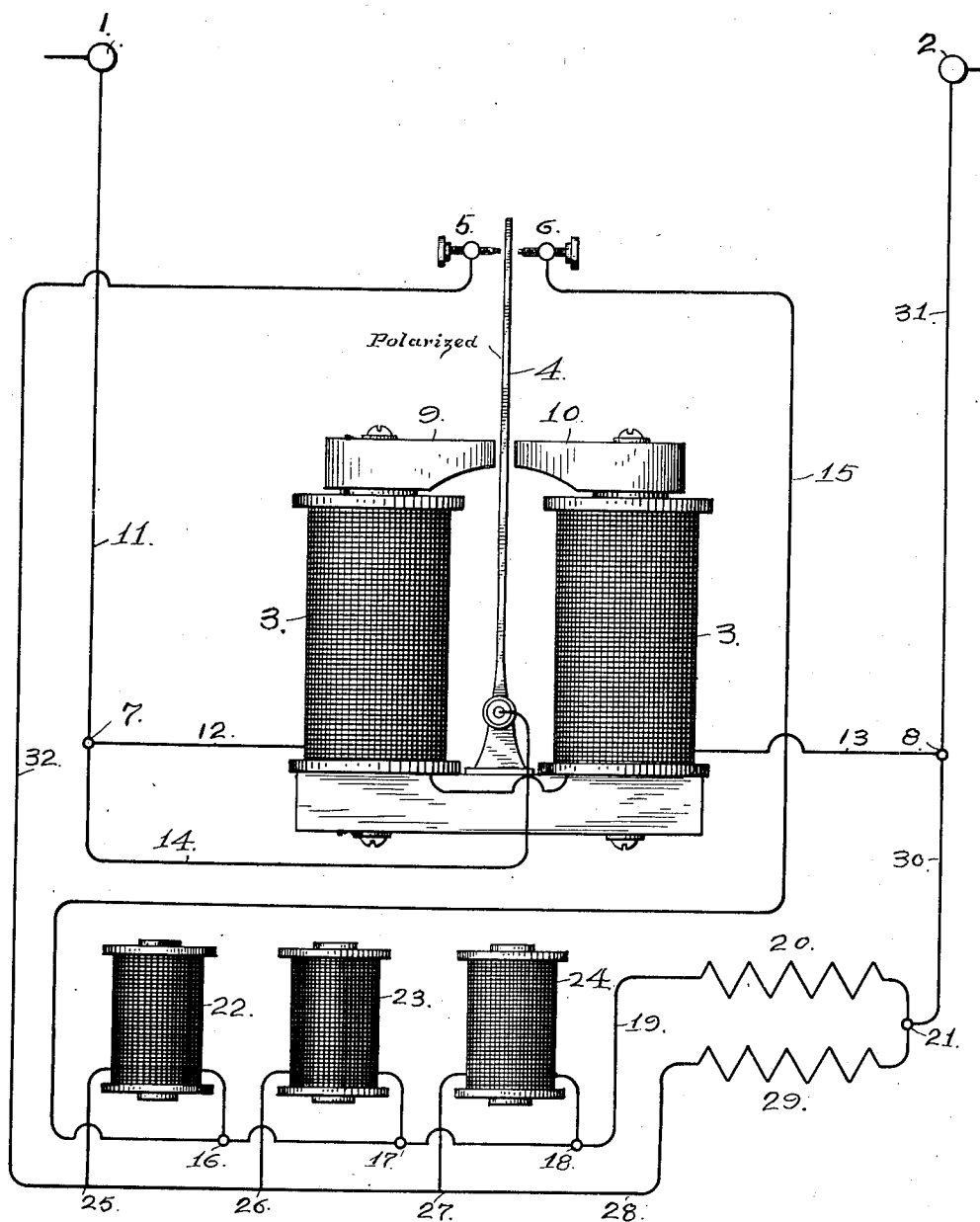


E. A. BURLINGAME.
METHOD OF UNIDIRECTING ELECTRIC CURRENTS.
APPLICATION FILED NOV. 11, 1908.

928,583.

Patented July 20, 1909.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ELMER A. BURLINGAME, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO BURLINGAME
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METHOD OF UNIDIRECTING ELECTRICAL CURRENTS.

No. 928,583.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed November 11, 1908. Serial No. 462,135.

To all whom it may concern:

Be it known that I, ELMER A. BURLINGAME, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California; have invented new and useful Improvements in Methods of Unidirecting Electrical Currents, of which the following is a specification.

My invention relates to a method of making electrical impulses of different directions over a line uni-directional through a desired apparatus.

An embodiment of my invention is illustrated by the accompanying drawing, which forms a part of this specification, and in which the figure shown is a diagrammatic view.

In the said drawing the numerals 1 and 2 are line terminals.

The numeral 3 represents a polarized relay, of which the permanent magnet is not shown. The lever 4, of the relay, is between the contact points 5 and 6. The relay magnets have the primary terminals 7 and 8, and present to the lever 4 the pole pieces 9 and 10.

The magnets 22, 23, and 24 represent the apparatus through which is required the uni-directional current.

As an illustration of the operation of my invention I will assume that an electrical impulse is received over a main-line wire at the terminal point 1. All of the current will flow through the wire 11 to the point 7. From this point it will pass through the wire 12, the coils of magnet 3, wire 13, to point 8. This will, assuming that the relay magnet is so adapted by its winding, pull the lever 4 against contact point 6. This action creates another path for the current from point 7, where it will divide and a portion pass through wire 14, lever 4, contact point 6, wire 15, to points 16, 17, and 18. The path of this portion of the current is then from these points 16, 17, and 18 through the magnets 22, 23, and 24 to points 25, 26, and 27. The two resistance coils 20 and 29 prevent a short circuit through the magnets 22, 23, and 24, and as the current is taken off from the point 21 by the wire 30, it will be seen that a portion of the current will pass through the magnets 22, 23, and 24 from points 16, 17, and 18 to points 25, 26, and 27. A portion of the current will pass by the wire 19, and coil 20, to point 21 and the other portion that passed through the mag-

nets will flow by wire 28 and coil 29 to point 21. There the current will join and pass by the wire 30 to point 8 where it will join that part of the current that passed through the relay 3. From point 8 the whole of the current will proceed by the wire 31 to the terminal point 2.

It will be noticed that the direction of the current through the magnets 22, 23, and 24 was from the points 16, 17, and 18 through the said magnets to points 25, 26, and 27. Now I will assume that an electrical impulse be received from the main line at terminal point 2, and that it passes through the apparatus in an opposite direction to that taken by the current just described. The current will flow over wire 31 to point 8. From this point it will go over wire 13, the magnet 3, wire 12, to point 7. This completes a circuit through magnet 3, and the current being in the opposite direction to the one just described, it will pull the lever 4 in contact with contact point 5. This closes a circuit which will carry a part of the current from point 8, over wire 30 to point 21, where two paths are presented to this part of the current. One is through the resistance coil 20, and wire 19, to points 18, 17, and 16. From these points the path is through the magnets 24, 23, and 22, to points 27, 26, and 25. The other path is through resistance 29 and wire 28. It will be seen that the resistance coils 20 and 29, as for illustration, form arms of a balance. When the current comes from point 21 the arms will be normally in balance. Now when the current is taken off by the wire 32 from the points 27, 26, and 25, the balance will be disturbed, and cause the current to flow from the points 18, 17, and 16, through the magnets 24, 23, and 22, to points 27, 26, and 25, because of the drop in the potential caused by the taking off of the current by the wire 32. This portion of the current will then pass by contact point 5, lever 4, wire 14, to point 7, where it will join with the portion that passed through the magnet 3 and the whole of the current then will pass on over the wire 11 to the line terminal 1. This current, it will be seen, was through the magnets 22, 23, and 24, from points 16, 17, and 18, to points 25, 26, and 27, which is the same direction as taken by the previous impulse of opposite main-line direction.

I prefer that the resistance coils 20 and 29 be so adapted to give greater resistance to the

flow of current than the resistance given by the magnets 22, 23, and 24.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

In an apparatus of the class described, a main-line circuit, a polarized relay magnet connected therein, secondary circuits in parallel, said secondary circuits connected with the main-line circuit by action of said polarized relay magnet, magnets connected across

the said parallel secondary circuits, and resistance coils in each of said parallel secondary circuits.

In testimony whereof I have affixed my signature in the presence of two witnesses, this 4th day of November, 1908.

ELMER A. BURLINGAME.

Witnesses:

FRANK L. OWEN,
ALPHEUS DIXON.