

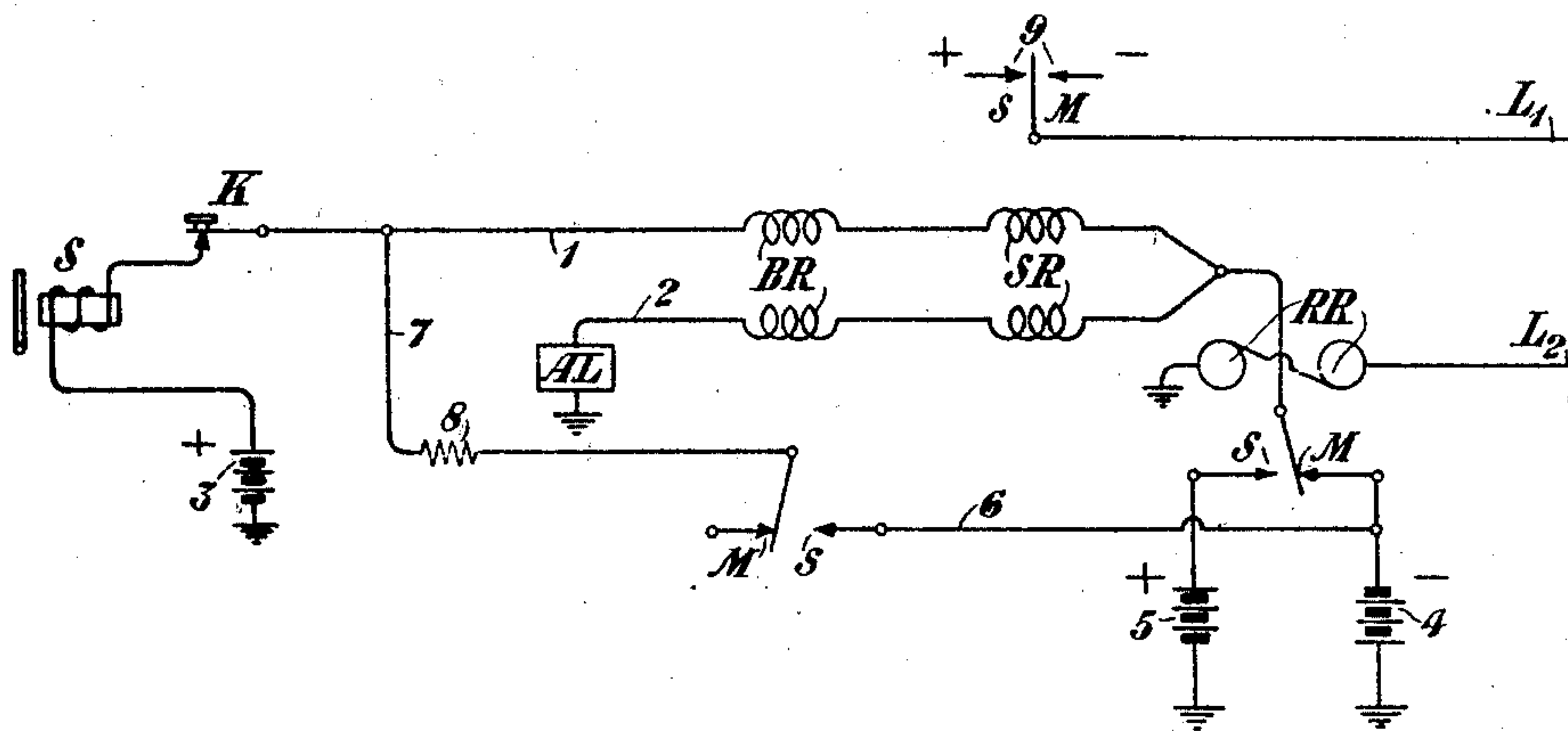
Jan. 12 , 1926.

1,569,055

A. WEAVER

TELEGRAPH CIRCUIT

Filed Jan. 19, 1924

**INVENTOR**

A. Weaver

BY

გეოგრაფიკული

ATTORNEY

UNITED STATES PATENT OFFICE.

ALLAN WEAVER, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

TELEGRAPH CIRCUIT.

Application filed January 19, 1924. Serial No. 687,362.

To all whom it may concern:

Be it known that I, ALLAN WEAVER, residing at Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Telegraph Circuits, of which the following is a specification.

This invention relates to telegraph systems and more particularly to "breaking" arrangements for such systems.

In telegraph systems, such for example as half duplex systems, it is often desirable for an operator at a station at which signals are being received to be able to send a "break" signal to interrupt the sending operator at the distant station in order to gain control of the line. This is generally accomplished by opening the local loop circuit and thus causing the armature of the sending relay to move to its spacing contact, while at the same time preventing the sending relay from being operated or affected by the action of the receiving relay caused by the incoming signals. The arrangements of this invention provide improved arrangements for this purpose. Other objects and features of the invention will appear more fully from the detailed description hereinafter given.

The invention may be more fully understood from the following description together with the accompanying drawing, in which is illustrated a circuit diagram of a telegraph station embodying the invention.

In the drawing is shown an incoming line L_2 terminating at a station in the polar receiving relay RR. Associated with the armature of the receiving relay RR are the marking and spacing contacts M and S, with which are associated the oppositely poled marking and spacing batteries 4 and 5 respectively. Connected to the armature of the receiving relay RR is a branched loop circuit 1, 2. The loop circuit includes the windings of a polar break relay BR and a polar sending relay SR. One end of the loop circuit will terminate in the artificial line AL and the other end of the loop circuit may include a key K, a sounder S and the battery 3. The loop circuit is associated with the armature of the receiving relay so that with the key closed the windings of the polar break relay and the windings of the sending relay will balance each other and will not be affected by the receiving relay armature. Controlled by the

sending relay SR is a pole changing device 9, connected with a line L_2 , whereby signals may be transmitted to a distant station. An armature and marking and spacing contacts M and S are provided for the break relay BR. The armature of the break relay is connected by conductor 7 to conductor 1 of the loop circuit and may include a resistance 8. The spacing contact of the break relay is connected by conductor 6 to the negative pole of battery 4 associated with the marking contact of the receiving relay.

When the subscriber at this station wishes to break or interrupt the distant operator transmitting signals over the line L_2 to the station, the key K will be opened. When the key K is opened the break relay BR will move its armature from its marking contact to its spacing contact. With the key K closed positive battery 3 would normally be applied to the windings of the relays BR and SR and through the artificial line to ground. However, when the key K is opened and the break relay BR moves its armature to its spacing contact, negative battery will be put on the relay windings in place of the positive battery from the subscriber's loop in the following manner: from ground, negative battery 4, conductor 6, spacing contact and armature of break relay BR, resistance 8, conductor 7, conductor 1, windings of break relay BR and sending relay SR, over conductor 2, artificial line AL, to ground. If, at this time, the armature of the receiving relay is on its marking contact no current will flow in the upper windings of the sending relay and break relay but a current will flow from battery 4 through the lower windings of the sending relay and the break relay to the artificial line and ground in such a direction as to cause the relays to maintain their armatures on their spacing contacts. If the armature of the receiving relay should now move to its spacing contact the current in the lower windings of the break relay and sending relay would be reversed, tending to cause these relays to move their armatures to their marking contacts. However, a current will at the same time flow in the upper windings of these relays as follows: from ground and positive battery 5, spacing contact and armature of receiving relay RR, the upper windings of sending relay SR and break relay BR, conductor 1, conductor 7, 110

resistance 8, armature and spacing contact of break relay BR, conductor 6, to negative battery 4 and ground.

As both batteries 5 and 4 will be included in the circuit through the upper windings of the sending and break relays and as only the battery 5 will be applied to the circuit through the lower windings of the break relay and sending relay the current flow in the upper windings will be greater than that in the lower windings by an amount sufficient to hold the armatures of these relays on their spacing contacts. Accordingly, a spacing signal will be sent out over the line L, regardless of the signal received at relay RR. When the subscriber in the loop circuit is receiving, the armature of the break relay BR, as has been pointed out, will be on its marking contact M. The duplex balance of the loop circuit 1, 2 will accordingly not be affected as the marking contact of the break relay is open.

Certain of the advantages of the arrangements of the invention consist in the fact that only low voltages are applied to the contacts of the break relay. No additional contacts other than those of the receiving relay in the main grounded line circuits are needed, and only one of the two contacts on the break relay are utilized, which accordingly makes the requirements of this relay less severe than in other instances.

While the invention has been disclosed in certain specific arrangements which are deemed desirable it is to be understood that it is capable of embodiment in many and widely varied forms without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. A telegraph system comprising a receiving relay, an armature therefore, marking and spacing contacts associated with said armature, marking and spacing batteries associated with said contacts, a branched loop circuit connected to said armature, windings in each branch of said loop circuit of a polar break relay and of a

polar sending relay, an armature for said break relay, marking and spacing contacts for said break relay, means for connecting the armature of said break relay to the upper branch of said loop circuit, and means for connecting the spacing contact of said break relay to the marking battery of said receiving relay.

2. A telegraph system comprising a receiving relay, an armature therefore, marking and spacing contacts associated with said armature, marking and spacing batteries associated with said contacts, a branched loop circuit connected to said armature, windings in each branch of said loop circuit of a polar break relay and of a polar sending relay, an armature for said break relay, marking and spacing contacts for said break relay, the windings of said break relay being so poled that when said loop circuit is opened the armature of said break relay will rest on its spacing contact, means for connecting the armature of said break relay to the upper branch of said loop circuit, and means for connecting the spacing contact of said break relay to the marking battery of said receiving relay.

3. A telegraph system comprising a receiving relay, an armature therefore, marking and spacing contacts associated with said armature, marking and spacing batteries associated with said contacts, a branched loop circuit connected to said armature, windings in each branch of said loop circuit of a polar break relay and a polar sending relay, and means controlled by said break relay for applying current from said marking and spacing batteries to said relay windings in said loop circuit in such directions that said relays will hold their armatures on their spacing contacts regardless of the position of the armature of said receiving relay.

In testimony whereof, I have signed my name to this specification this 16th day of January 1924.

ALLAN WEAVER.