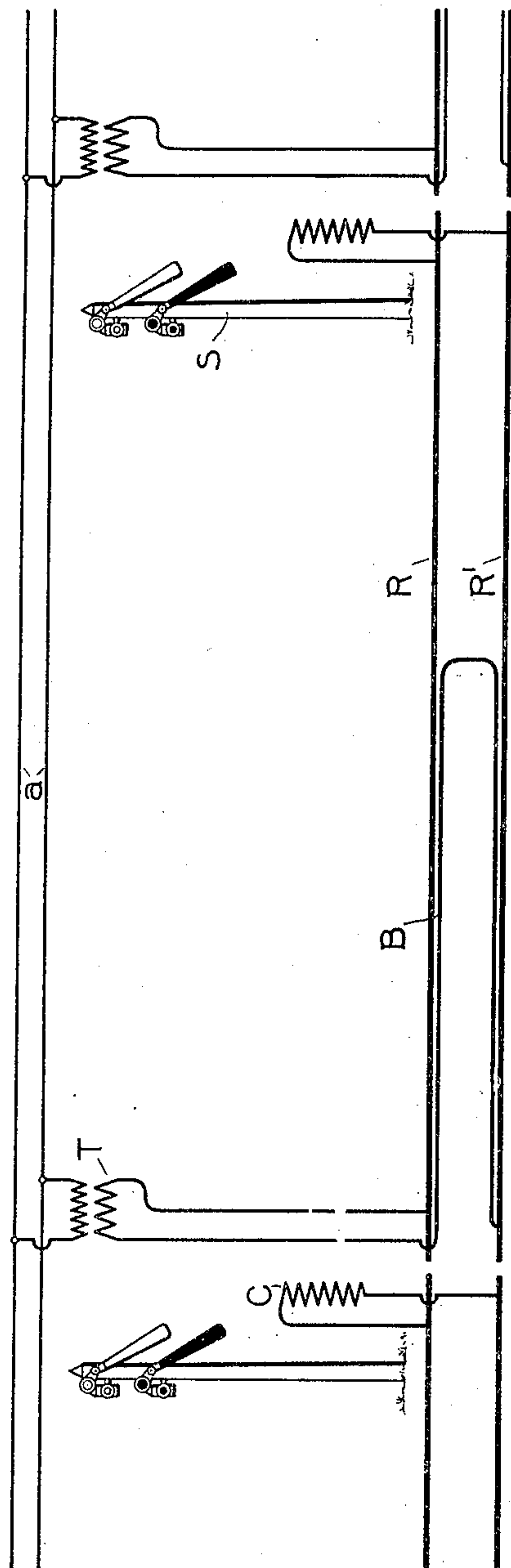


No. 769,983.

PATENTED SEPT. 13, 1904.

F. B. COREY.  
BLOCK SIGNAL SYSTEM.  
APPLICATION FILED FEB. 10, 1904.

NO MODEL.



Witnesses:

*Harry H. Tilden*  
*Allen Orford*

Inventor:

Fred B. Corey.  
by *Allen B. Davis*

Atty.

# UNITED STATES PATENT OFFICE.

FRED B. COREY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## BLOCK-SIGNAL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 769,983, dated September 13, 1904.

Application filed February 10, 1904. Serial No. 192,916. (No model.)

*To all whom it may concern:*

Be it known that I, FRED B. COREY, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Block-Signal Systems, of which the following is a specification.

My invention relates to block-signal systems in which alternating current is employed for operating the signals; and the object of my invention is to diminish the self-induction of the rail-circuits, so as to render possible the satisfactory operation of such systems over very long blocks. The voltage that can be impressed on a rail-circuit is limited by the insulation of the rails, which is necessarily low, and consequently the length of blocks with which satisfactory operation can be obtained is limited by the impedance of the rail-circuit, since it is important that the source of current be connected to one end of the block and the signal-operating relays at the other end in order that a break in the track may be detected and since with great length of block or high impedance not enough current can be obtained for satisfactory operation of the signals. When direct current is used for the signal-circuit, the impedance of the rail-circuit is simply its ohmic resistance and sufficient current may be obtained with long blocks; but when alternating current is used in addition to the resistance the rails offer a considerable self-induction, owing to their distance apart, and the current for a given length of block is greatly reduced. That means that the permissible length of block is much less with alternating than with direct current. By my invention I provide means for diminishing the self-induction of the rail-circuit, and thereby increase the length of blocks permissible with alternating current.

My invention will be best understood by reference to the accompanying drawing, in which—

*a* represents conductors connected to an alternating-current source from which the current for operating the signals is obtained. The line-wires *a* are connected to the rails of

each block *R R'* through a transformer *T*. The secondary of the transformer *T* is connected to the rails at one end of a block, while to the rails at the other end of the block is connected the electroresponsive device *C*, which operates the signals of semaphore *S*. The means for operating the semaphore are merely indicated diagrammatically by *C* and are not shown in detail, since many arrangements for operating signals electromagnetically are well known in the art, and such means form no part of the present invention. It is sufficient for the present invention that it be understood that the current in *C* is utilized in any well-known manner to operate relays in the circuits of suitable operating mechanisms for the signals on the semaphore-posts. The rails *R R'*, owing to their distance apart, offer a considerable self-induction, which reduces the current-flow for a given impressed voltage, as has been heretofore explained. To diminish this self-induction, I employ the conductor *B*, extending in close proximity to a portion (preferably about half) of the rails of the block and connected in series with the rail-circuit, either between the source and the rails, as shown in the drawing, or between the rails and the coil *C*. The conductor *B* is in inductive relation to the rail-circuit and is so connected that the current therein at any instant flows in the opposite direction to the current in the adjacent rail. By this means the self-induction of the rail-circuit is largely reduced, the current-flow for a given impressed voltage is increased, and the permissible length of the block is correspondingly extended.

I do not desire to limit myself to the particular construction of parts here shown, since changes which do not depart from the spirit of my invention and which are within the scope of the appended claims will be obvious to those skilled in the art.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a block-signal system, a source of alternating current connected to the rails at one end of a block, an electroresponsive device connected to the rails at the other end of the



block so that the current for the said device flows through all the rails of the block, and means for neutralizing the self-induction of the rails.

5 2. In a block-signal system, a source of alternating current connected to the rails at one end of a block, an electroresponsive device connected to the rails at the other end of said block, and an electric conductor in inductive  
10 relation to the rails of the blocks and connected in series with the rail-circuit.

3. In a block-signal system, a source of alternating current connected to the rails at one end of a block, an electroresponsive device  
15 connected to the rails at the other end of the block, and an electric conductor paralleling a

portion of the rails of the block and in inductive relation thereto and connected in series with the rail-circuit.

4. In a block-signal system, a source of alternating current connected to the rails at one end of a block, an electroresponsive device connected to the rails at the other end of the block, and an electric conductor in close proximity to a portion of the rails of the block  
25 and connected in series with the rail-circuit.

In witness whereof I have hereunto set my hand this 8th day of February, 1904.

FRED B. COREY.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.