

No. 765,212.

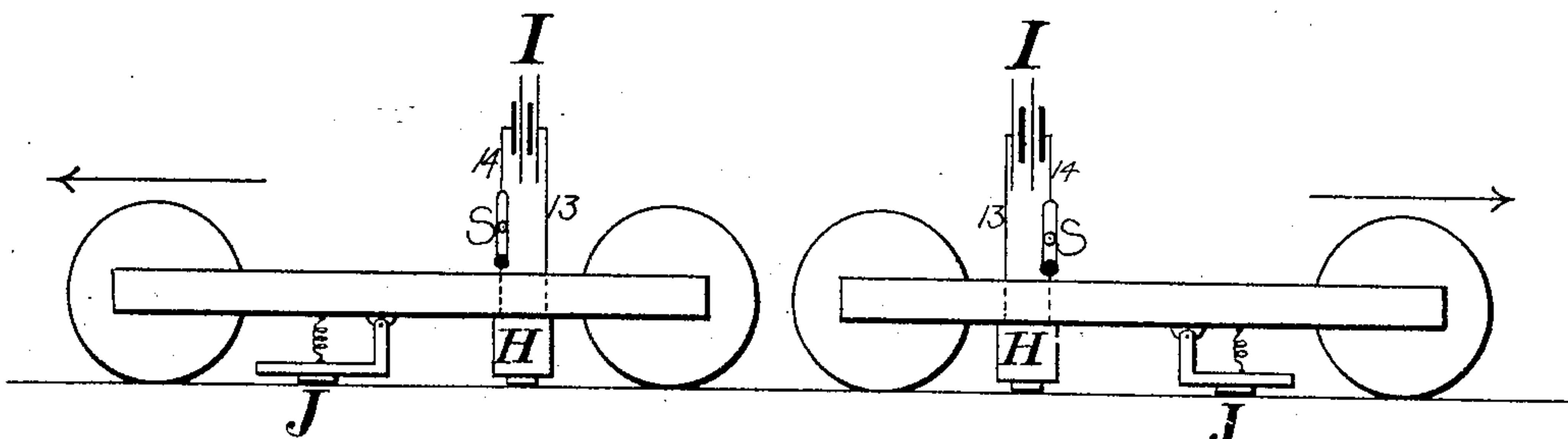
PATENTED JULY 19, 1904.

G. THOMPSON.

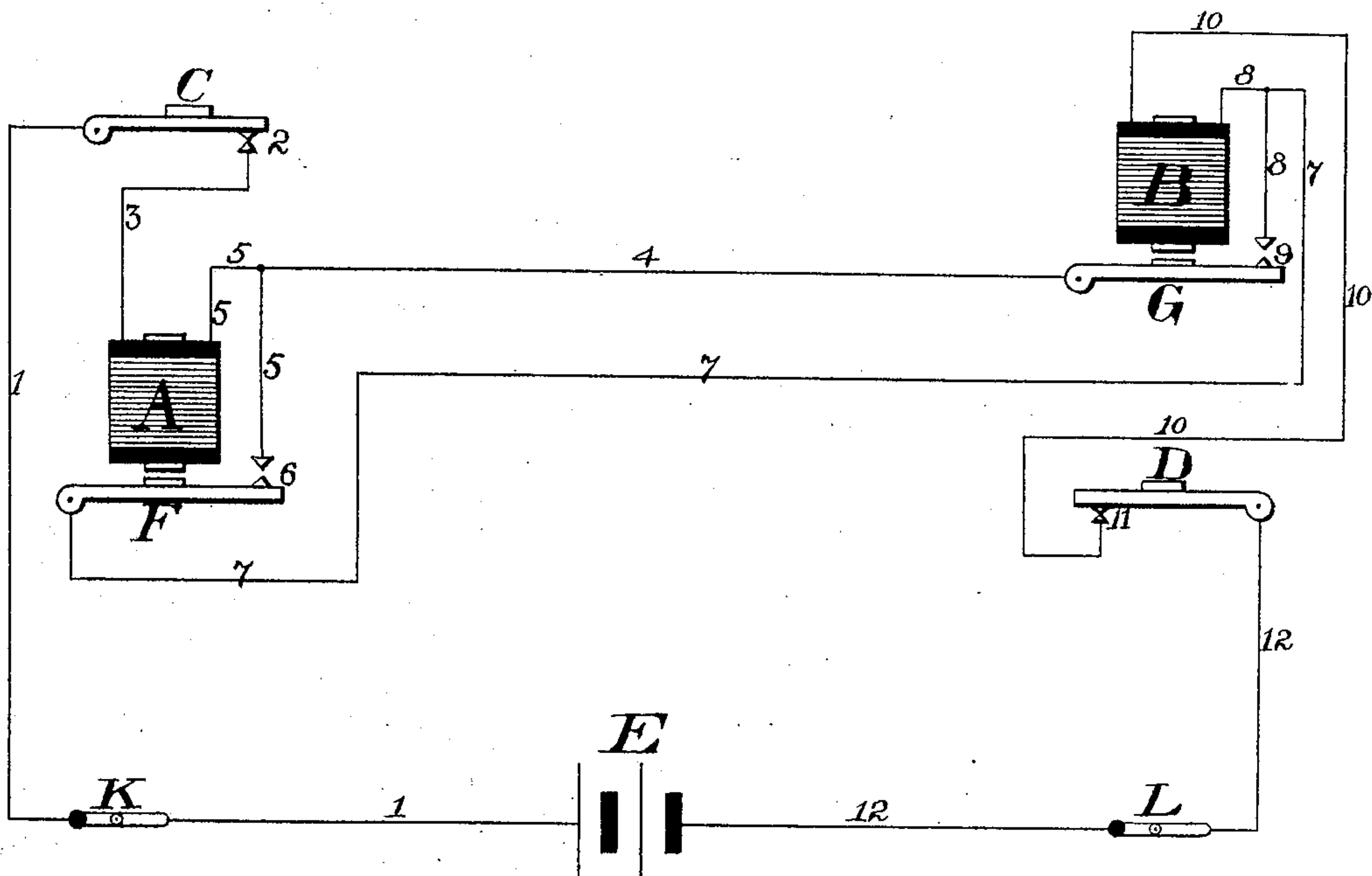
ELECTROMAGNETIC BLOCK SYSTEM OF CONTROL.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.



*Fig 2.*



*Fig 1.*

*Witnesses*  
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# UNITED STATES PATENT OFFICE.

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## ELECTROMAGNETIC BLOCK SYSTEM OF CONTROL.

SPECIFICATION forming part of Letters Patent No. 765,212, dated July 19, 1904.

Application filed March 17, 1902. Serial No. 98,592. (No model.)

*To all whom it may concern:*

Be it known that I, GUION THOMPSON, a citizen of the United States, residing at the city of Duluth, in the county of St. Louis and State of Minnesota, have invented new and useful Improvements in Electromagnetic Block Systems of Control, of which the following is a specification.

My invention relates to electromagnetic block systems of control, and has for its object the provision of means for progressively establishing and dissolving spheres of magnetic energy at a predetermined distance from each other upon the route of a conveyance. I attain these objects by the means shown in the accompanying drawings, in which—

Figure 1 is a diagram showing electromagnets, their armatures, and movable contacts attached to such armatures, other armatures attached to movable contacts, switches, a battery, and their connections, comprising the portion of my invention which is anchored upon the route of a conveyance. Fig. 2 is a diagram showing duplicate oppositely-directed movable conveyance carrying similar equipments, comprising, first, an electromagnet, a battery, a switch, and their connections, and, second, for the purpose of illustrating one of the utilities of said invention, an armature.

E, Fig. 1, represents a battery, as shown, or other source of electricity.

A and B, Fig. 1, are electromagnets, and F and G are the armatures of electromagnets A and B, respectively, and 6 and 9 are normally open circuit-controlling contacts, as shown, or switches operated by armatures F and G.

C and D, Fig. 1, are armatures diagonally opposite to each other and respectively attached to normally closed circuit-controlling contacts 2 and 11.

1, 3, 4, 5, 7, 8, 10, and 12, Fig. 1, represent conductors of electricity from battery E to electromagnets A and B.

K and L, Fig. 1, are switches for the purpose of opening the circuit from battery E.

H, Fig. 2, represents a magnet of constant or alternating polarity, shown in the drawing as an electromagnet, on a movable convey-

ance, so placed that its pole shall pass over or near the pole of electromagnet A and armature D, Fig. 1, when the conveyance is in motion in the direction A to D and over or near the pole of electromagnet B and armature C when the conveyance is in motion in the direction B to C.

I, Fig. 2, represents a battery, as shown, or other source of electricity carried by said conveyance.

13 and 14, Fig. 2, represent conductors of electricity from battery I to electromagnet H.

S, Fig. 2, is a switch for the purpose of opening the circuit from battery I.

The operation of the device is as follows: When a pole of magnet H on the movable conveyance (represented by Fig. 2) traveling in the direction A to D, Fig. 1, passes or is sufficiently near a pole of electromagnet A, the magnetism of magnet H, Fig. 2, is taken up or conducted by the core of electromagnet A, Fig. 1, which attracts armature F, making contact of 5 and 6, whereby an electric circuit is established from source E, through conductor 1, switch K, movable contact 2, conductor 3, coil of electromagnet A, conductor 5, movable contact 6, conductors 7 and 8, coil of electromagnet B, conductor 10, movable contact 11, conductor 12, and switch L, to source E, thereby maintaining magnetism in electromagnet A, which continues contact at 6 and maintains circuit last described, and thereby also causing electromagnet B to attract its armature G, making contact of 8 and 9, whereby conductor 4 is connected in the circuit last described in multiple with conductor 7. Now when a pole of magnet H, Fig. 2, passes or is sufficiently near the armature D, Fig. 1, said armature D is attracted by said magnet H, Fig. 2, breaking contact between conductor 10 and movable contact 11, which opens the hereinbefore-described circuit from source E through electromagnets A and B, thereby causing electromagnets A and B to lose their magnetism, which releases armatures F and G and allows them to return to their normally open position. The movable contact 11 returns to its normally closed position so soon as the mag-



netic action of magnet H, Fig. 2, ceases to operate on armature D, Fig. 1. In similar manner when a pole of magnet H on the movable conveyance (represented by Fig. 2) traveling in the direction B to C, Fig. 1, passes or is sufficiently near a pole of electromagnet B the magnetism of magnet H, Fig. 2, is taken up or conducted by the core of electromagnet B, Fig. 1, which attracts armature G, making contact of 8 and 9, whereby an electric circuit is established from source E, through conductor 1, switch K, movable contact 2, conductor 3, coil of electromagnet A, conductor 5, conductor 4, movable contact 9, conductor 8, coil of electromagnet B, conductor 10, movable contact 11, conductor 12, and switch L, to source E, thereby maintaining magnetism in electromagnet B, which continues contact at 9 and maintains circuit last described, and thereby also causing electromagnet A to attract its armature F, making contact of 6 and 5, whereby conductor 7 is connected in the circuit last described in multiple with conductor 4. Now when a pole of magnet H, Fig. 2, passes or is sufficiently near the armature C, Fig. 1, said armature C is attracted by said magnet H, Fig. 2, breaking contact between conductor 3 and movable contact 2, Fig. 1, which opens the last hereinbefore-described circuit from source E through electromagnets B and A, thereby causing electromagnets B and A to lose their magnetism, which releases armatures G and F and allows them to return to their normally open position. The movable contact 2 returns to its normally closed position so soon as the magnetic action of magnet H, Fig. 2, ceases to operate on armature C, Fig. 1.

The purposes and utilities of my said invention are manifold; but one illustration will be sufficient, for the purpose of which illustration it may be assumed that my said invention is incorporated in a railway-train signal system and that said conveyances are locomotives, each carrying an armature J, to which is connected a whistle-cord or other signaling apparatus carried by said locomotive and adapted to be operated through the medium of said armature and that said armature is so positioned on said locomotive as to be carried near either one of said electromagnets A or B, according to the direction of movement of said locomotive. Now if the electromagnets A and B, Fig. 1, be energized by source E, as hereinbefore shown, when the armature J on a movable conveyance (represented by Fig. 2) traveling in the direction A to D, Fig. 1, passes or is sufficiently near electromagnet A, Fig. 1, said armature J, Fig. 2, will be attracted and by its movement will operate such assumed signaling apparatus connected therewith, and when the armature J on a movable conveyance (represented by Fig. 2) traveling in the direction B to C, Fig. 1, passes or is sufficiently near electromagnet B, Fig. 1, said

armature J, Fig. 2, will be attracted and by its movement will operate such assumed signaling apparatus connected therewith.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A normally open electric circuit including a source of electricity, a normally closed circuit-controlling contact, the coil of an electromagnet, a normally open circuit-controlling contact adapted to be closed by said electromagnet when said magnet is energized, the coil of a second electromagnet electrically connected in multiple with the coil of the first said electromagnet through said normally open contact and through a second normally open circuit-controlling contact included in said circuit and adapted to be closed by said second electromagnet when said second electromagnet is energized, and a second normally closed circuit-controlling contact, substantially as described.

2. A combination comprising a normally open electric circuit, including a source of electricity, a normally closed circuit-controlling contact, the coil of an electromagnet a normally open circuit-controlling contact, the coil of a second electromagnet, electrically connected in multiple with the coil of the first said electromagnet through said normally open contact and through a second normally open circuit-controlling contact, and a second normally closed circuit-controlling contact, a local governing-lever, adapted to open the first said normally closed contact, a second local governing-lever adapted to close the first said normally open contact and to be governed by the first said electromagnet when said electromagnet is energized, a third local governing-lever adapted to close the second said normally open contact and to be governed by the said second electromagnet, when said second electromagnet is energized, and a fourth local governing-lever adapted to open the second said normally closed contact.

3. A combination comprising a normally open electric circuit, including a source of electricity, a normally closed circuit-controlling contact, an armature adapted to open said contact, the coil of an electromagnet a normally open circuit-controlling contact, an armature controlled by said magnet to close said contact, a second normally open circuit-controlling contact, the coil of a second electromagnet, electrically connected in multiple through said open contacts with the coil of the first said electromagnet, an armature controlled by said second magnet, to close said second normally open contact, a second normally closed contact, an armature adapted to open said second normally closed contact; a traveling source of magnetic energy, adapted when moving in one direction to first magnetically energize the first said electromagnet and, continuing, to pass out of influential distance of the first said electromagnet and



subsequently to operate the armature adapted to open said second normally closed contact, and when moving in the opposite direction, in a different course, to first magnetically energize the second said electromagnet and, continuing, to pass out of influential distance of said second magnet and subsequently to operate the armature adapted to open the first said normally closed contact.

- 10 4. A combination comprising, first, a normally open electric circuit, including a source of electricity, a normally closed circuit-controlling contact, the coil of an electromagnet, a normally open circuit-controlling contact, the  
15 coil of a second electromagnet, electrically connected in multiple with the coil of said first electromagnet through said normally open contact and through a second normally open contact and a second normally closed circuit-controlling contact, and, second, local means embody-  
20 ing an armature and controlling the position of one of the members of the first said normally closed contact, and adapted to open said contact, local means embodying an armature and  
25 controlling the position of one of the members of the first said normally open contact and adapted to close said contact and to be governed by the first said electromagnet when said magnet is energized, local means embody-

ing an armature and controlling the position 30  
of one of the members of the second said normally open contact, and adapted to close the said second normally open contact and to be governed by said second electromagnet when said second magnet is energized, local means, 35  
embodying an armature and controlling the position of one of the members of the second said normally closed contact and adapted to open said second normally closed contact, a traveling source of magnetic energy adapted 40  
when moving in one direction to first magnetically energize the first said electromagnet and, continuing, to subsequently operate the local means for opening the second said nor-  
45 mally closed contact, and when moving in the opposite direction in a parallel course, to first magnetically energize the second said electromagnet, and, continuing, to subsequently operate the local means for opening  
50 the first said normally closed circuit.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUION THOMPSON.

Witnesses:

HENRY TAYLOR,  
ISABELLA M. TAYLOR.