

No. 828,788.

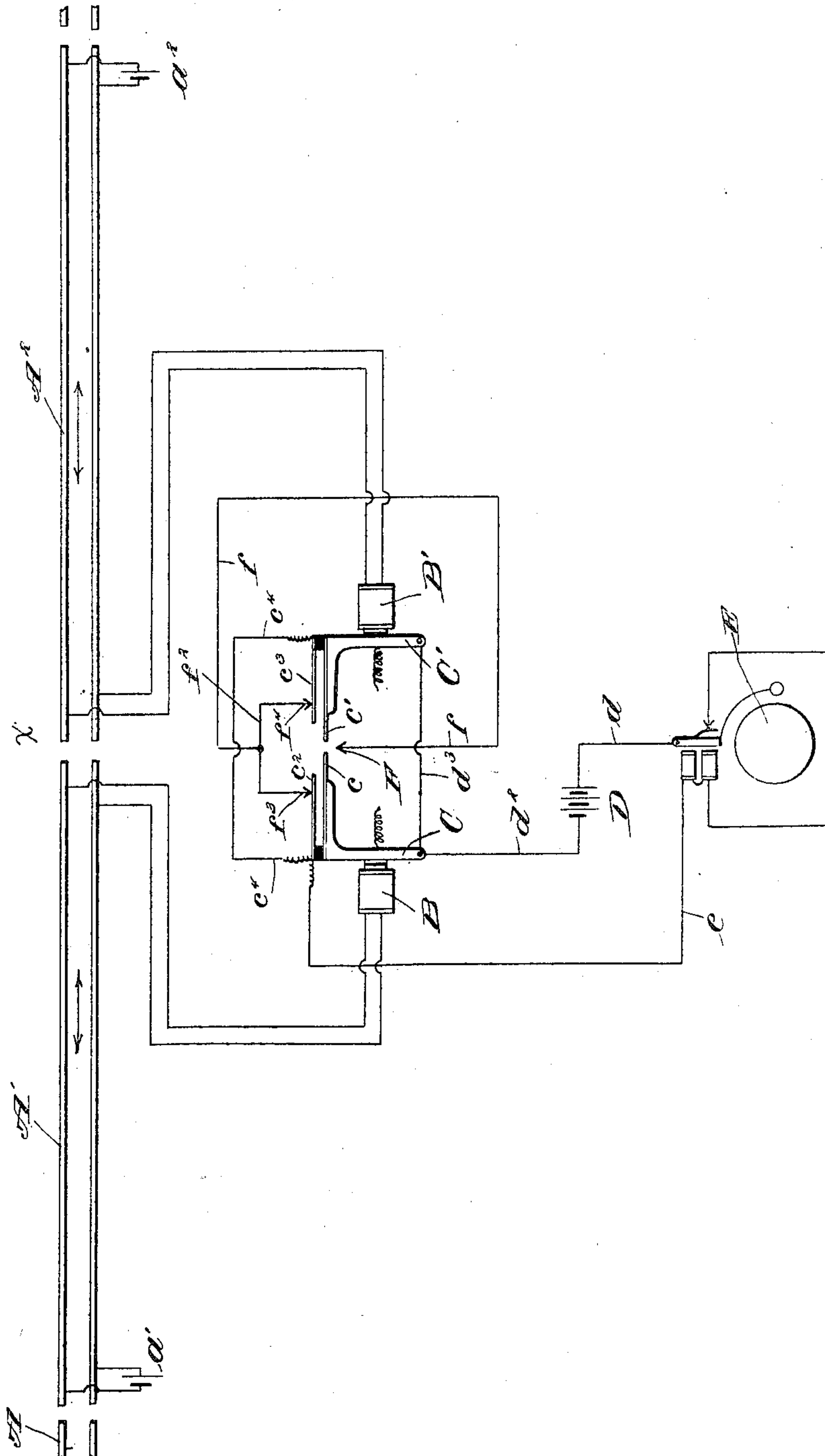
PATENTED AUG. 14, 1906.

E. W. VOGEL.  
ELECTRIC CROSSING SIGNAL FOR RAILWAYS.

APPLICATION FILED MAY 20, 1901.

2 SHEETS--SHEET 1.

Fig. 1



Witnesses

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2 SHEETS—SHEET 2.

Fig. 1.

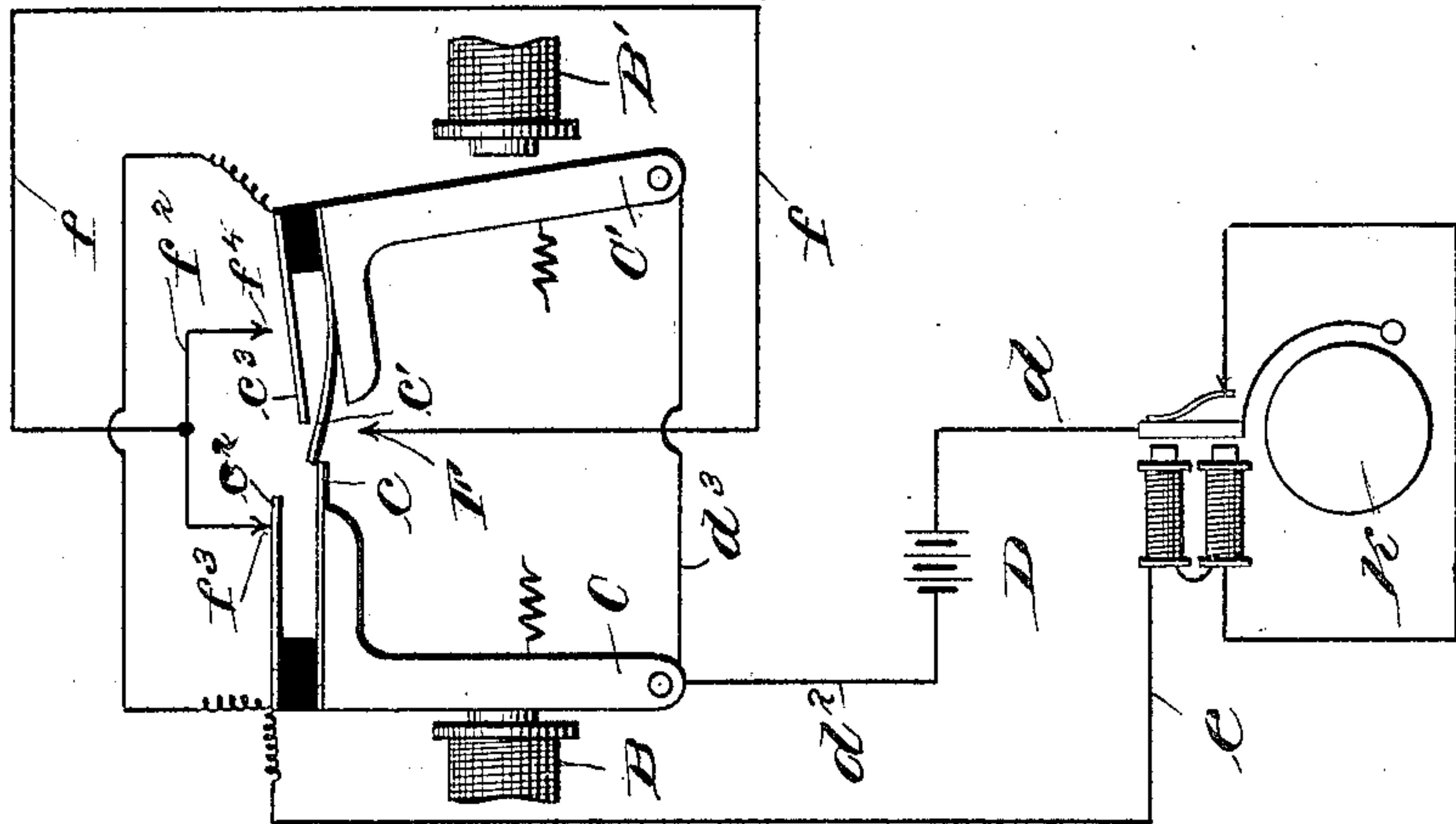


Fig. 2.

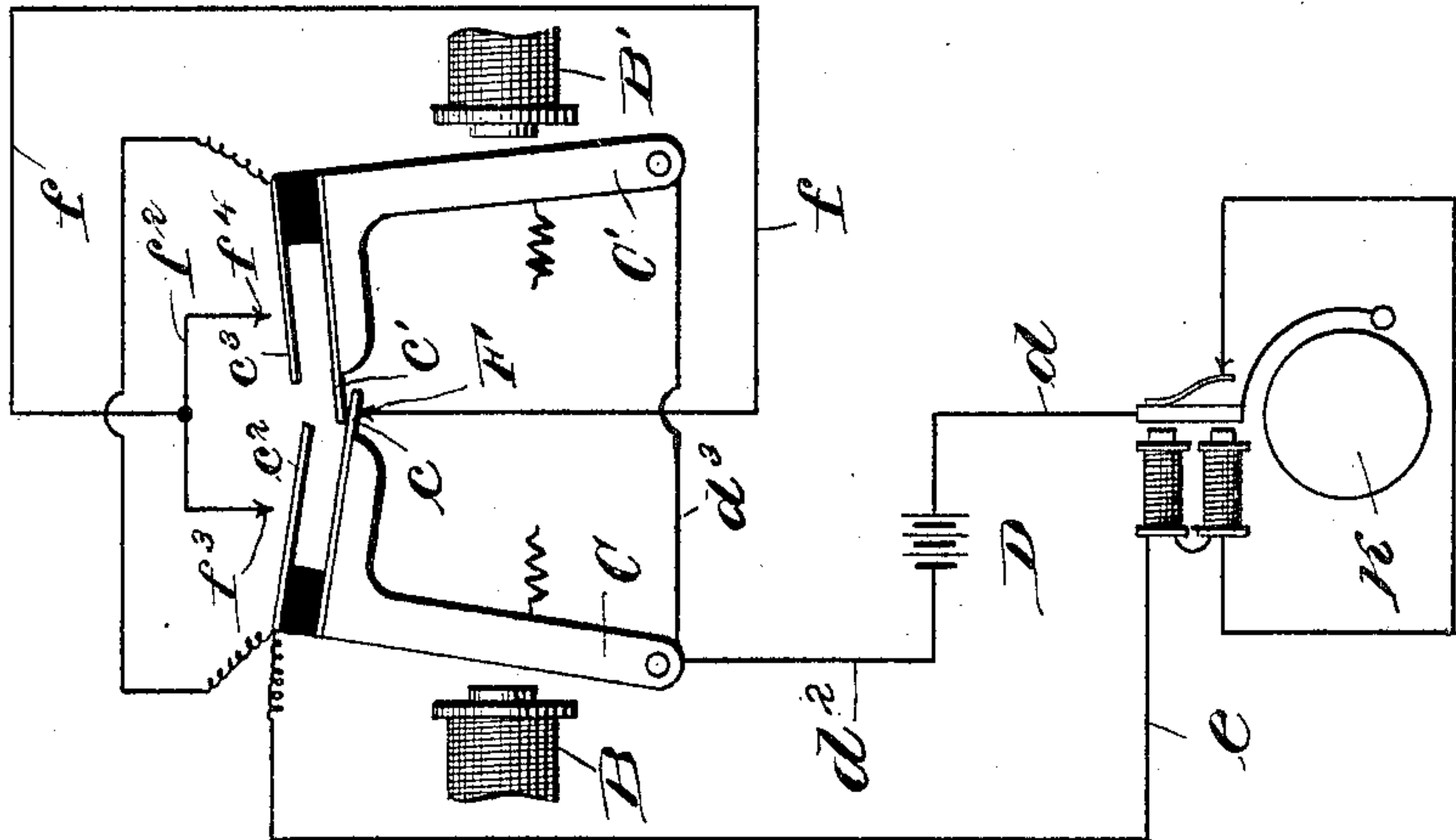
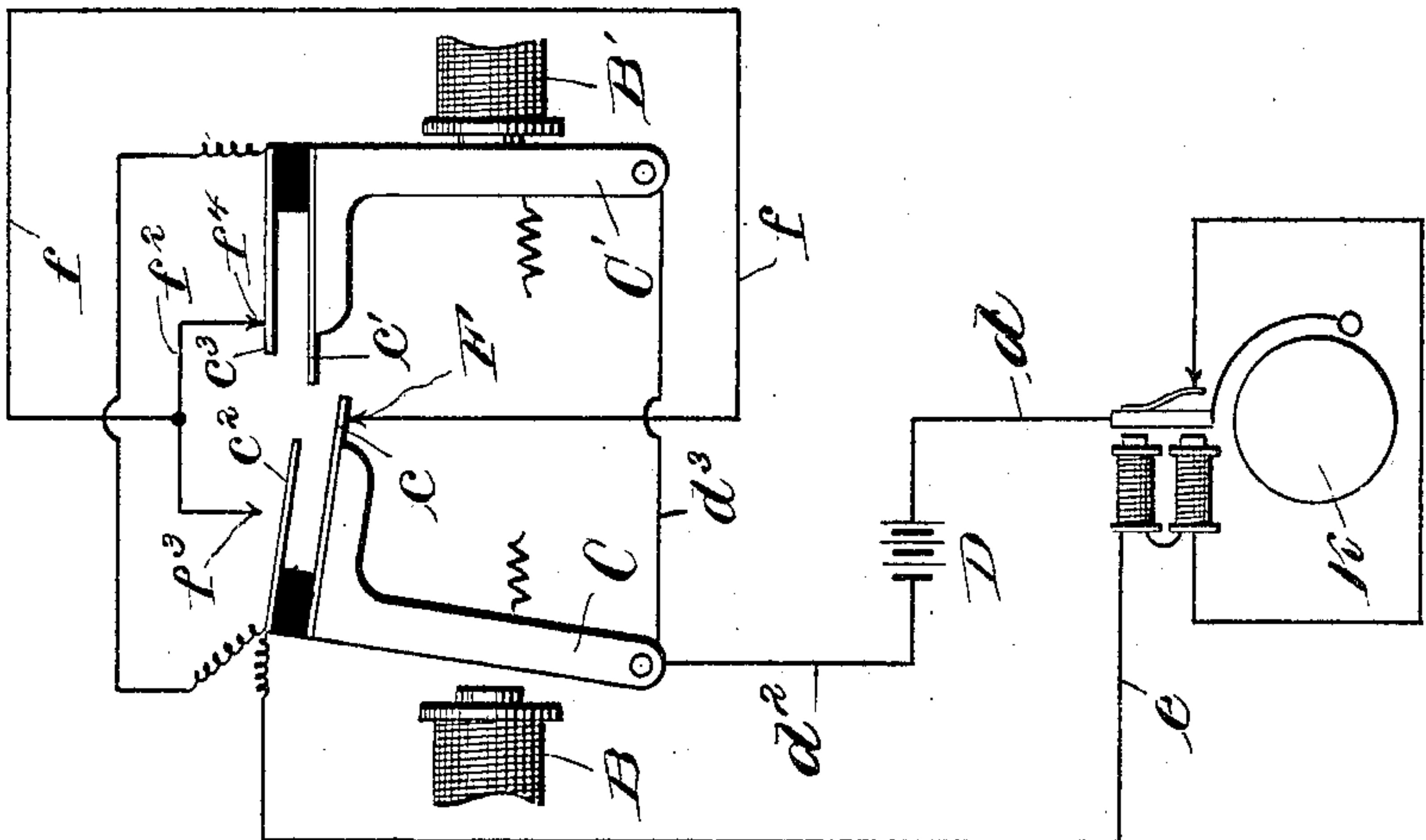


Fig. 3.



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# UNITED STATES PATENT OFFICE.

EUGENE W. VOGEL, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE RAILROAD SUPPLY COMPANY, A CORPORATION OF ILLINOIS.

## ELECTRIC CROSSING-SIGNAL FOR RAILWAYS.

No. 828,788.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed May 20, 1901. Serial No. 61,144.

*To all whom it may concern:*

Be it known that I, EUGENE W. VOGEL, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Signaling Devices; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in signaling devices and embraces electrically-operated signals arranged to operate as a railway-train approaches a crossing, station, or predetermined position and to be silenced or otherwise discontinued when the first trucks of the train reach the said station or crossing or position and to give no signal whatsoever as the train having passed said crossing or position recedes therefrom.

The invention consists of the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a diagrammatic view illustrating my invention. Fig. 2 is a diagrammatic view illustrating the armatures in the positions which they assume when a train is on the first insulated section of the track A'; Fig. 3, a similar view illustrating the positions of the armatures when a train coming from the left has entered track-section A<sup>2</sup> and occupies both of the insulated track-sections A' and A<sup>2</sup>; and Fig. 4, a similar view illustrating the positions of the armatures when a train has passed entirely from section A', but still occupies section A<sup>2</sup>.

In the drawings, A indicates a railway-track, having therein the insulated track-sections A' A<sup>2</sup> on each side of the crossing.

a' indicates a battery of any desired number of cells connected with the insulated track-section A'. A similar battery a<sup>2</sup> is connected in the section A<sup>2</sup>.

B B' indicate, respectively, the electromagnets of an interfering relay, each of which is electrically connected with one of said insulated sections A' A<sup>2</sup>. For convenience said relays are shown as of the Hovey type, though obviously other relays may be employed for the purpose of operating the cir-

cuits. The armatures C C' of said relays are provided with springs which act normally to pull the same inwardly away from the electromagnets. Contact-springs c c' are secured, respectively, at the upper ends of said armatures and extend toward each other in position to fall upon the contact-point F, located below and between the same, when their respective electromagnets are deenergized. On the upper ends of the armatures are provided supplemental contact-springs c<sup>2</sup> c<sup>3</sup>, respectively, which are insulated from the contact-springs c c' and their respective armatures. A conductor c<sup>4</sup> connects the opposite ends of said contact-springs c<sup>2</sup> c<sup>3</sup>. The contact-piece F is connected with a conductor f, the other end of which is provided with two contact-pieces f<sup>3</sup> f<sup>4</sup>, which are located adjacent to the respective contact-springs c<sup>2</sup> c<sup>3</sup> and are normally in contact therewith when the armatures are supported by their electromagnets.

D is a main battery connected in the circuit with an electromagnetic bell E. The conductor between the battery and bell is indicated by d. Said battery is also connected with the armature C by the conductor d<sup>2</sup>, which is connected with the armature C' by means of the conductor d<sup>3</sup>. A conductor e leads from the magnetic bell to and is connected with the conductor c<sup>4</sup>.

The operation of my device is as follows: A train entering the section A' short-circuits the battery a' and permits the armature C to drop upon the contact F, as shown in Fig. 2. This breaks the contact between the contact-spring c<sup>2</sup> and the contact-point f<sup>3</sup>. By the fall of said armature the bell or other signaling-circuit is closed, thereby causing the signal to operate. Said circuit is formed as follows: From the battery D to the conductor d<sup>2</sup>, armature C, contact-spring c, contact F, and conductor f, contact f<sup>4</sup>, arm or contact-spring c<sup>3</sup>, conductors c<sup>4</sup> and e, to the bell and back to the battery through the conductor d. The bell will continue to ring until the first trucks of the train strike the insulated section A<sup>2</sup>, whereupon the battery a<sup>2</sup> is short-circuited, permitting the armature C' to drop on the armature C, as illustrated in Fig. 3. This breaks the connection between spring-contact c<sup>3</sup> and the contact



$f^4$ , thereby breaking the bell-circuit. As the train recedes from the crossing as the last truck of the same passes from the insulated section A' the electromagnet B is energized by the battery  $a'$  and the armature C is picked up, lifting therewith the armature C', breaking the connection with the contact F. The signal-circuit is therefore broken at contact F and the signal continued inoperative, inasmuch as the spring-contacts  $c^2$  and  $c^3$ , which are connected with the conductor  $e$ , are insulated from the armature C and C', respectively, which are connected with the other lead  $d^2$  of the signal-circuit. Obviously any number of supplemental arms may be employed in connection with a relay to operate circuits similar to those herein described.

Many details of arrangement and construction may be modified without departing from the principle of my invention.

I claim as my invention—

1. In an electric circuit, the combination with a plurality of automatically-movable members included in said circuit, of electrical connections controlled by said members comprising fixed contacts, and movable contacts carried by but insulated from said members whereby said members are adapted to close said circuit when moved singly and to break said circuit when moved together, substantially as described.

2. In an electric circuit, the combination with a plurality of automatically-movable members included in said circuits, of electrical connections controlled by said members comprising fixed contacts, and movable contacts carried by but insulated from said members whereby said circuit is broken when said members are in the same relative positions and said circuit is closed when said members are in different relative positions, substantially as described.

3. In an electric circuit, the combination with a plurality of fixed contacts, of a plurality of automatically-movable members, contacts carried by but insulated from said members, and electrical connections between said members and between said insulated contacts whereby the movement of one of said members controls the circuit through an insulated contact carried on the other member, substantially as described.

4. In an electric circuit, the combination with a plurality of fixed contacts, a plurality of independently and automatically movable members each adapted when moved to make a contact and to break a contact, means for actuating said movable members, and electrical connections whereby said circuit is broken by said movable members when in similar relative positions and closed by said members when in different relative positions, substantially as described.

5. In a signaling device, the combination

with an electric circuit, of a battery therein, a signal included in said circuit, independently-movable members located in and controlling said circuit, and electrical connections between said movable members whereby a movement of either of said members singly from its normal position completes the circuit through the other movable member and thereby operates the signal, substantially as described.

6. In a signaling device, the combination with an electric circuit, of a battery therein, signal mechanism included in said circuit, independently and automatically movable members located in and controlling said circuit, and electrical connections between said movable members whereby the movement of either of said members singly from its normal position closes said circuit through the other member and thereby operates the signal, and the movement of both of said members from their normal positions breaks the circuit and discontinues the signal, substantially as described.

7. In a device of the class described, the combination with an electric circuit, of a battery therein, a signaling device included in said circuit, duplicate independently and automatically movable members located in and controlling said circuit, means for actuating said members, and electrical connections comprising fixed contacts, and movable contacts carried by but insulated from said members whereby said movable members when in the same relative positions and in different relative positions operate and discontinue said signal, substantially as described.

8. In a signal for railways, the combination with an electric circuit, of a battery therein, signal mechanism included in said circuit, duplicate independently and automatically movable members located in and controlling said circuit, electrical connections comprising fixed contacts, and movable contacts carried by but insulated from said members whereby said movable members when in different relative positions operate the signal and when in the same relative positions discontinue the signal, and means operated by a moving train for actuating said movable members, substantially as described.

9. In a signaling device for railways, the combination with an electric circuit, of a battery therein, signal mechanism included in said circuit, a plurality of independently and automatically movable members located in and controlling said circuit, electrical connections between said members comprising fixed contacts, and movable contacts carried by but insulated from said members whereby a movement of either acts to break a contact and to make a contact, and means whereby a moving train controls the movement of said members to different relative positions and



to similar relative positions to operate the signal and to discontinue the same, substantially as described.

10. In a signaling device for railways, the combination with an electric circuit of a battery and a signal included therein, a relay having its armature connected in said circuit, an insulated arm on said armature, a conductor in position to be engaged by said armature in one of its positions and a contact at the opposite end of said conductor adapted to be engaged by said arm when the armature is in its other position, said arm being also connected in said circuit and means controlling said relay whereby a train or the like approaching said signal causes said armature to fall breaking one contact and forming the other thereby actuating the signal and whereby said armature is restored to its normal position as the train passes the same.

11. In a crossing-signal for railways, the combination with a track provided with insulated track-sections and a track-battery on each side of a crossing, of a double relay having its electromagnets electrically connected with the respective track-sections, an electrical circuit, the armatures of said relay and a battery and signal connected therein, an insulated arm on each armature one of which is connected with a conductor of said circuit, a conductor positioned to be engaged by either of said armatures when its electromagnet is deenergized, contacts at its opposite end adapted to normally engage said insulated arms whereby a train approaching said crossing on one track-section completes the circuit and actuates the signal, and discontinues said signal when entering the other section and passing the crossing.

12. In a device of the class described, an

electric circuit, a battery, a signal and the armatures of a multiple relay connected therein, a conductor connected with one of said armatures, an insulated arm on each armature connected with the other conductor of said circuit, a contact-point located between said armatures and in position for contact therewith when the magnet of either is deenergized, a conductor leading therefrom and provided with contact-points adapted to engage each of said arms and means controlled by a train or the like approaching said signal for moving one of said armatures thereby actuating the signal, and means controlled by the train passing said signal for moving the other armatures thereby discontinuing the signal.

13. In an electric circuit, a circuit-controller, comprising a plurality of movable members, means for holding said members in normal position and permitting the members to separately move from such normal position, contacts carried by but insulated from said members, fixed contacts engaged by said members and the insulated contacts carried thereby, and conductors so connected with said fixed and movable contacts that the movement of either of said members from normal position changes the condition of the circuit, while the movement of a plurality of said members from normal position restores the circuit to its first condition, substantially as described.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

EUGENE W. VOGEL.

In presence of—

H. H. VAUGHAN,  
J. P. WIBORG.