

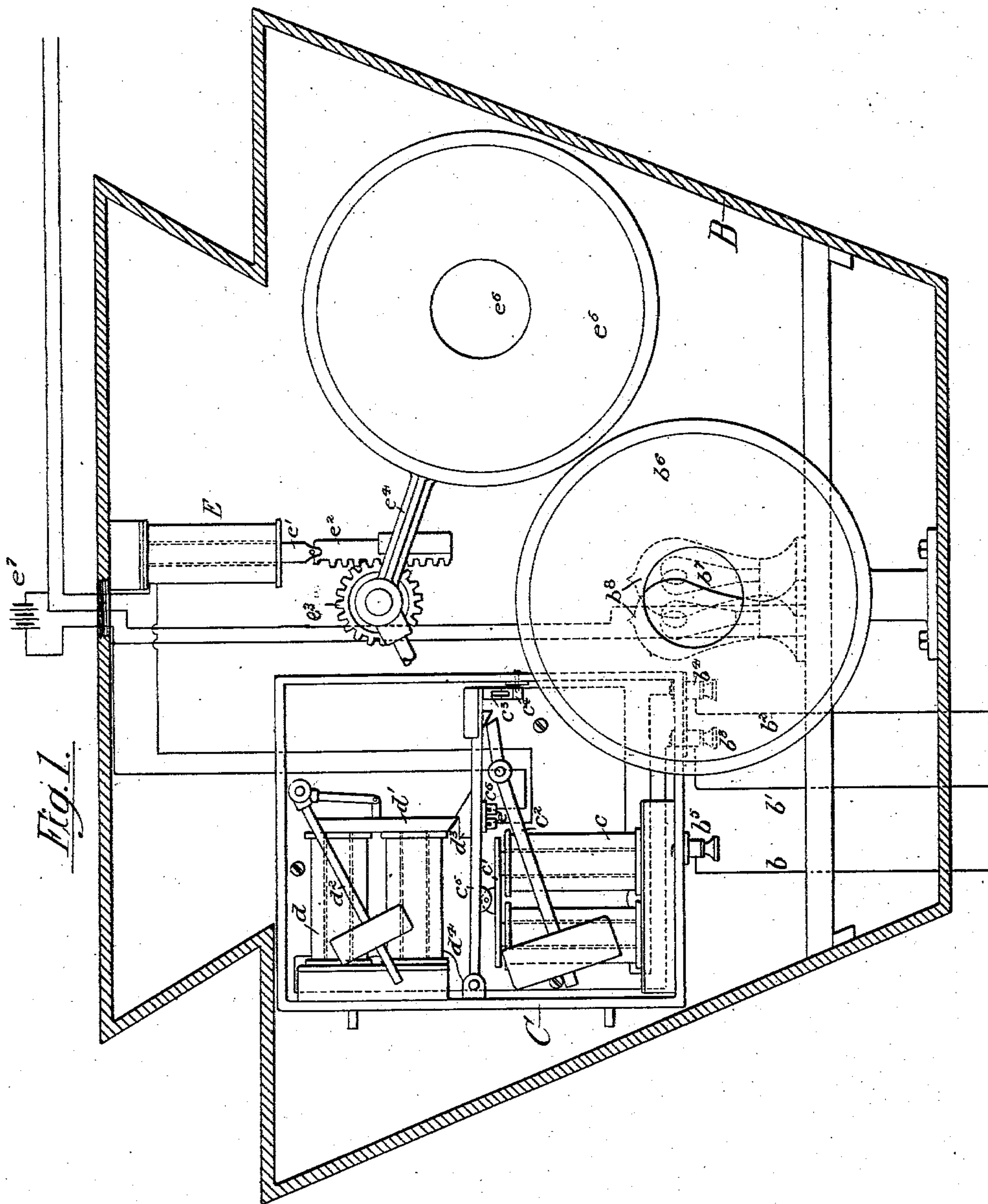
No. 740,312.

PATENTED SEPT. 29, 1903.

J. L. RICKETTS.
SIGNALING MECHANISM.
APPLICATION FILED AUG. 21, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:-

Titus H. Irons.

Frank L. A. Mahan.

Inventor:-

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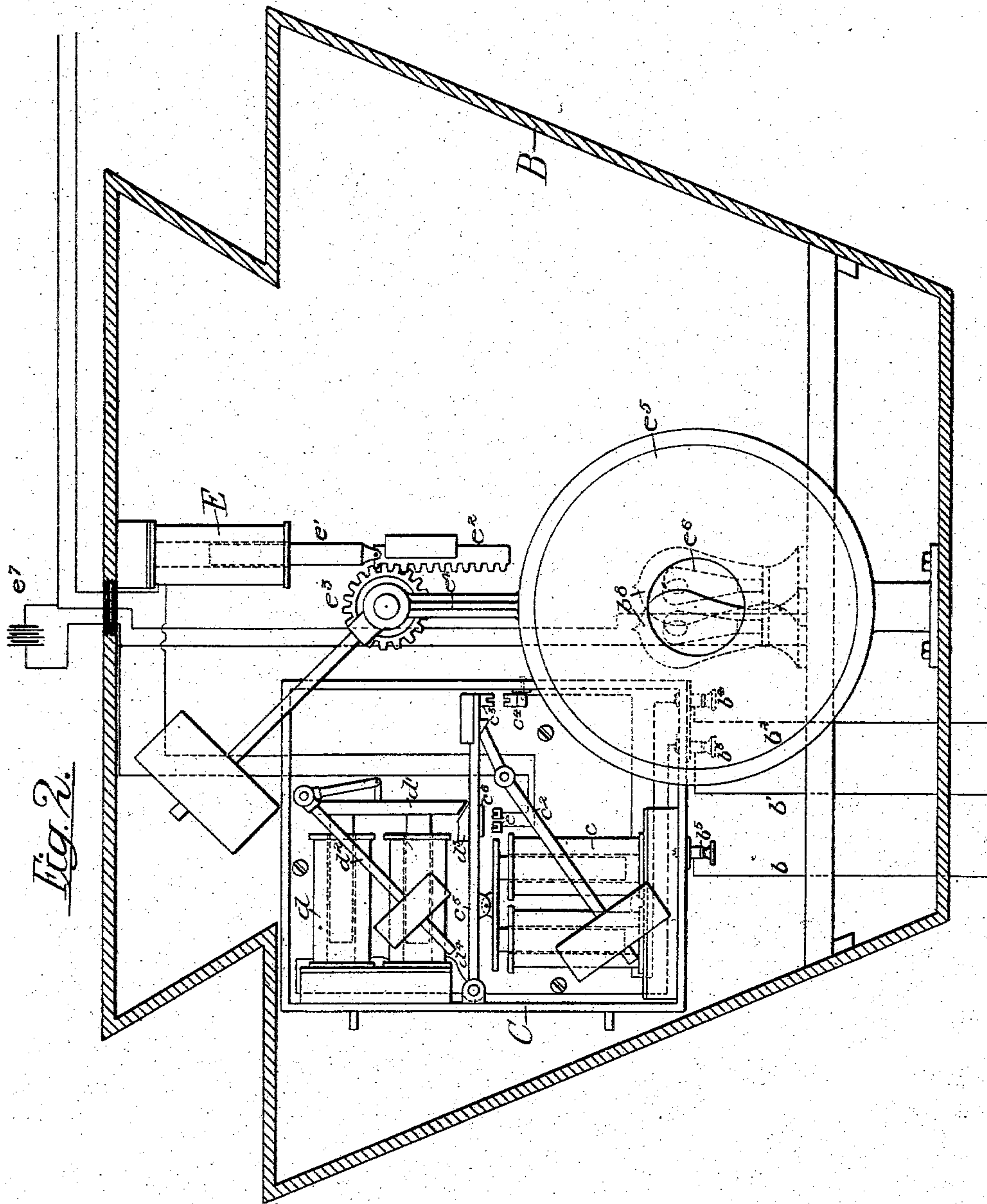
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 4.

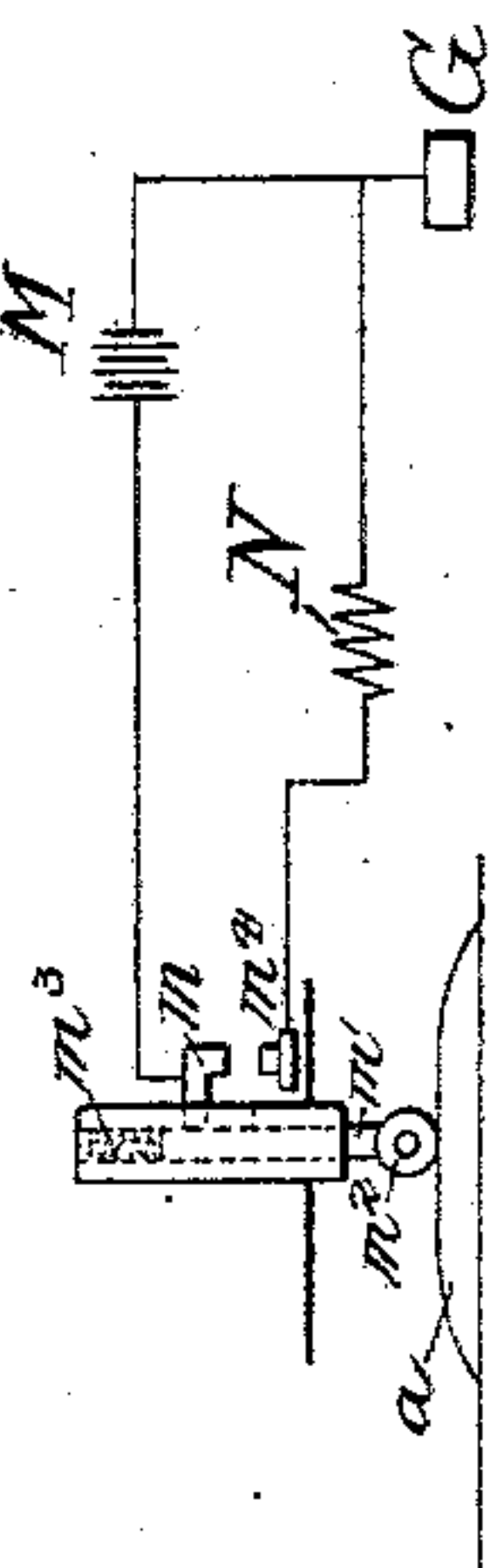
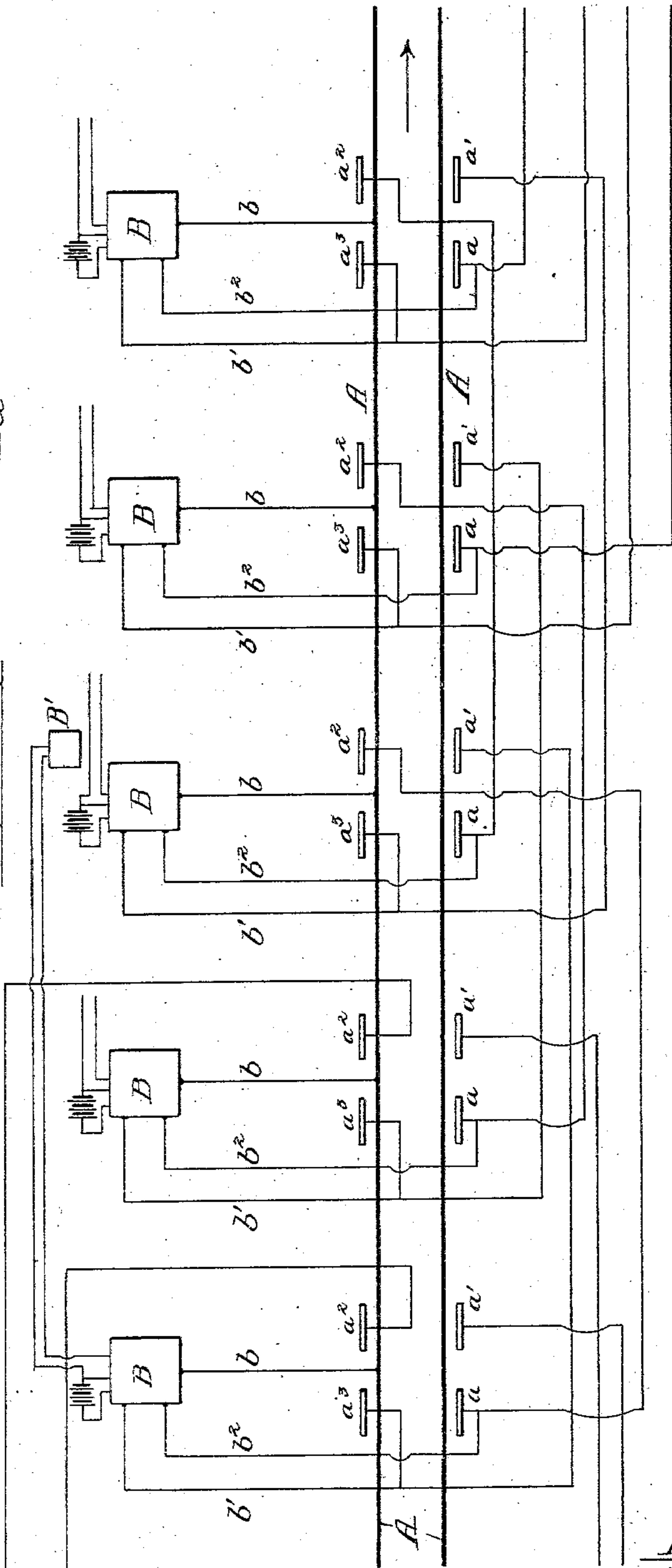


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN L. RICKETTS, OF PHILADELPHIA, PENNSYLVANIA.

SIGNALING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 740,312, dated September 29, 1903.

Application filed August 21, 1902. Serial No. 120,605. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. RICKETTS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Signal Mechanism, of which the following is a specification.

My invention relates to certain improvements in signal mechanism for railways, and more particularly consists of an improved device for use in connection with the electrical
10 safety signal or alarm system described and claimed in my application for Letters Patent No. 9,386, filed March 19, 1900.

The object of the invention is to provide a
15 simple and inexpensive mechanism which shall be operated by the passage of a locomotive or car through the agency of an electric current supplied by some suitable generator,
20 preferably carried by said car, to set a signal to indicate danger and to operate other signals to indicate that the track is clear for a certain definite distance.

This object I attain as hereinafter set forth, reference being had to the accompanying
25 drawings, in which—

Figure 1 is a sectional elevation of my improved mechanism, partly in diagram, illustrating the device in the "safety position." Fig. 2 is a sectional elevation of my improved mechanism, showing the various parts
30 in the positions occupied when indicating danger. Fig. 3 is a diagrammatic view of the system as a whole, showing the application thereto of my improved mechanism; and Fig. 4 is a diagrammatic view of the apparatus
35 and connections therefor carried by a locomotive or car operating in connection with my improved signal mechanism.

In the above drawings, A represents the
40 rails of one track of a railroad which is divided into a number of so-called "blocks," at the beginning and at the end of each of which is placed a set of contact-plates a and a' , supported on one side of the track, it being assumed in the description of the construction
45 and operation of my improved system as hereinafter set forth that a train will normally run in the direction indicated by the arrow shown on Fig. 3 and carrying a contact-finger of metal the contact-piece on that side
50 of the track having the plates a and a' . At the same time it will be understood that pro-

vision is made whereby the pressure of a train moving in a direction opposite to the above will be indicated, and for this purpose there
55 are upon the opposite side of the track at the beginning and end of each block a second set of contact-plates a^2 and a^3 , of which the first is connected to a plate a two blocks to the rear and on the other side of the track, while
60 the second plate a^3 is connected to the plate a' two blocks ahead and also on the other side of the track. This plan of connection is adhered to throughout the system, and at the beginning of each block there is placed a
65 main signal-box B, containing my improved mechanism, as well as an auxiliary signal-box B', connected to a main signal-box two blocks distant.

In Fig. 4 I have illustrated diagrammatic-
70 ally the apparatus and connections therefor carried by a locomotive or car for use in connection with my signal mechanism, this apparatus consisting, essentially, of a battery or other generator M, having one of its terminals
75 connected to the frame of the car or locomotive, and hence to the ground or rail, and with its other terminal connected to a movable switch-arm m , connected to a vertically-sliding contact-piece m' , which is pro-
80 vided at its end with a roller or other form of brush m^2 for engagement with the contact-plates a or a' . A spring m^3 normally retains the piece m' in a position such that the switch-arm m is in electrical contact with a plate m^4 ,
85 which is connected to the generator at a point between it and the ground connections G through a permanent resistance N. It will be seen, therefore, that under normal conditions the generator M is short-circuited
90 through the resistance N, but that when the brush m^2 strikes one of the contact-plates a or a' the current from said generator passes into said plate and through any electric circuit which may be connected thereto, return-
95 ing to the generator through the ground connection G.

There are three wires b , b' , and b^2 extending from the mechanism within the casing B to the track and its various contacts, the first
100 of said wires being preferably connected at one end to a binding-post b^5 on the metallic box C within the casing B and grounded to one of the rails A at its other end. The wire

b' extends from a binding-post b^3 , supported on but insulated from the box C, to the contact-plate a' two blocks ahead and on the side to engage the contacts carried by a train running in the normal direction, the said wire being also connected to a contact-plate a^3 at the beginning of the block at which the casing B is placed and on the opposite side of the track from the contacts a' . The wire b^2 is connected to a binding-post b^4 , also insulated from the metallic box C, and has its other end connected to the contact-plate a at the beginning of the block which this particular casing B guards and also to the contact-plate a^2 on the opposite side of the track two blocks in front.

The circuit from the binding-post b^4 passes through a magnet c in the box C, adapted to act upon an armature c' , upon which also acts a weighted lever c^2 through the medium of a pivoted lever c^5 , the weighted lever tending to raise the armature or move it in a direction contrary to that in which it is moved by the attraction of the magnet. Leading from the binding-post b^3 is a circuit including a magnet d , which has an armature d' , acted upon by a weighted lever d^2 , tending to move it outward or in a direction contrary to the direction in which it is moved by the attraction of the magnet, this lever d^2 being adapted to engage with a block d^3 on the pivoted lever c^5 , so as to hold the latter in its depressed position against the lifting action of the lever c^2 . The magnet d has one end of its winding connected to the metallic box C and from this to the ground through binding-post b^5 and wire b , such connection being made permanently through a wire d^4 . The winding of the magnet c is connected to a contact-piece c^4 , supported by but insulated from the casing C, and said piece is so placed as to be engaged by a plate c^3 , carried by the end of the lever c^5 , which is in electrical connection with the said casing. The lever c^5 also carries a second and insulated plate c^6 , adapted when the armature is depressed to make contact with a pair of plates e , insulated from each other and forming terminals in an electric circuit in which is contained a magnet E, provided with a movable core e' , connected to a guide-rack e^2 , which meshes with a spur-pinion e^3 on a rock-shaft carrying a counterbalanced lever e^4 , with a red banner e^5 , having a central disk e^6 , of red glass. Secured to the casing B is a white banner b^6 , having a central disk b^7 of white glass, and behind this banner are a pair of incandescent lamps b^8 , connected in parallel with the same electric circuit which supplies current to the magnet E.

The wires of the circuit containing the magnet E are connected to a suitable electric generator e^7 and are extended to an auxiliary signal-box B', placed two blocks in front of its main signal-box. This auxiliary box contains apparatus the same as that in the main

box, except that the casing C, with its mechanism and connections, is omitted.

The safety position of the signal is that represented in Fig. 1, the armature c' , with its lever c^5 , being depressed and held in such position by the armature d' so as to close the switches $c^3 c^4$ and $c^6 e$. This permits current to flow through the solenoids E both in the main and in the auxiliary casings, (it being understood that the lamps b^8 remain permanently lighted,) with the result that the cores e' are retained within their magnets, so as to keep the banner e^5 in its elevated or safety position. When, therefore, an engine or car carrying the mechanism shown diagrammatically in Fig. 4 passes over the track-contact at the beginning of the block, the electric circuit in which is the battery or generator M, carried by the engine or car, will be broken, while said generator will have its circuit completed through contact-roller m^2 , contact a , and its connections, and finally through the ground connection G, with the result that the magnet c will be energized and the armature c' will be attracted, so as to release its lever c^5 from locking engagement with the armature d' , the latter then moving outwardly by reason of the action of its weighted lever d^2 . As soon as the circuit of the generator M is opened by the passing of the car-contact roller off of the contact a the magnet c will be deenergized and the armature c' , with its lever c^5 , will be raised by the action of the weighted lever c^2 , so as to open the switch $c^3 c^4$ as well as the switch $c^6 e$. This open circuits or deenergizes the magnet E and permits the red banner e^5 , with its disk e^6 , to fall and cover the white banner b^6 and disk b^7 , thereby giving the danger-signal, as shown in Fig. 2, both at the main signal-box B and also at the auxiliary signal-box B' two blocks ahead of said main box. The parts of this particular pair of boxes remain in the danger position until the engine or car on leaving the second block ahead grounds the circuit carried by it through the contact-plate a' , wire b' , and magnet d , whereupon the armature d' of said magnet will be attracted and the beveled end of the same, acting upon the correspondingly-beveled face of the block d^3 upon the lever c^5 , attached to the armature c' , will depress and relock this latter, again closing the switches $c^3 c^4$ and $c^6 e$, thereby permitting the current to again pass through the magnet E, thereby raising the core or armature e' and swinging the red banner e^5 , with its disk e^6 , to one side, as shown in Fig. 1.

The operation of the system will be understood from the above description, and it will be seen that as a train enters each block it strikes the contact a and sets to the danger position the main signal-box at the beginning of that block as well as the auxiliary box two blocks ahead. Immediately thereafter it strikes a contact a' and sets to the safety po-

sition a main signal-box two blocks to the rear as well as its auxiliary box at the beginning of the block it is entering. If now a train is running in the opposite direction on the same track, its contact-roller m^2 will strike the contacts a^2 and a^3 , setting to "danger" a main box two blocks ahead as well as its auxiliary box at the end of the block which it is entering and immediately thereafter setting to "safety" through the contact a^3 the adjacent main box at the end of the block entered as well as the auxiliary box two blocks in its rear.

I claim as my invention—

1. In a signal apparatus, the combination of a magnet having an armature and a switch-bar attached thereto, switch-contacts cooperating with said bar, a pivoted lever carrying a weight and placed so that it engages the switch-bar and tends to move it against the action of said magnet, a second magnet having mechanism for locking the switch-bar in a closed position, and an electroresponsive device in circuit with the switch-bar and contacts, substantially as described.

2. In a signal apparatus, the combination of a magnet having an armature, a switch-bar to said armature, a plurality of switch-contacts cooperating with said bar, a lever having a weight and placed so that it movably bears against the switch-bar and tends to move the same in a direction opposite to that caused by the action of said magnet, a second magnet having a locking-bar cooperating with the switch-bar to keep the latter in a closed position, means tending to move the locking-bar against the action of its magnet, an electroresponsive signal in circuit with

one of the magnets and controlled by the same, substantially as described.

3. In a signal apparatus, the combination of two magnets, one of the same having an armature with a switch-bar attached thereto, two independent switch-contacts placed to be simultaneously closed by said switch-bar, the second magnet having means directly attached to its armature and operative upon the switch-bar for locking the said bar in a position to close both switches, an electromagnetic signal in circuit with one of the switches, the second switch being in the circuit of one of the magnets, substantially as described.

4. In a signal apparatus, the combination of two magnets, a pivoted bar attached to the armature of one of said magnets, a plurality of independent contacts placed to be simultaneously engaged by said bar, certain of said contacts being in circuit with one of said magnets, the second magnet having an armature placed to retain the pivoted lever in a position to close the circuits of the said contacts, a device tending to move the said lever away from the contacts and a second device tending to move the armature of the second magnet from its locking position and an electromagnetic signal in the circuit of one of said contacts, substantially as described.

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

JOHN L. RICKETTS.

Witnesses:

FLORENCE HILLMAN,
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