

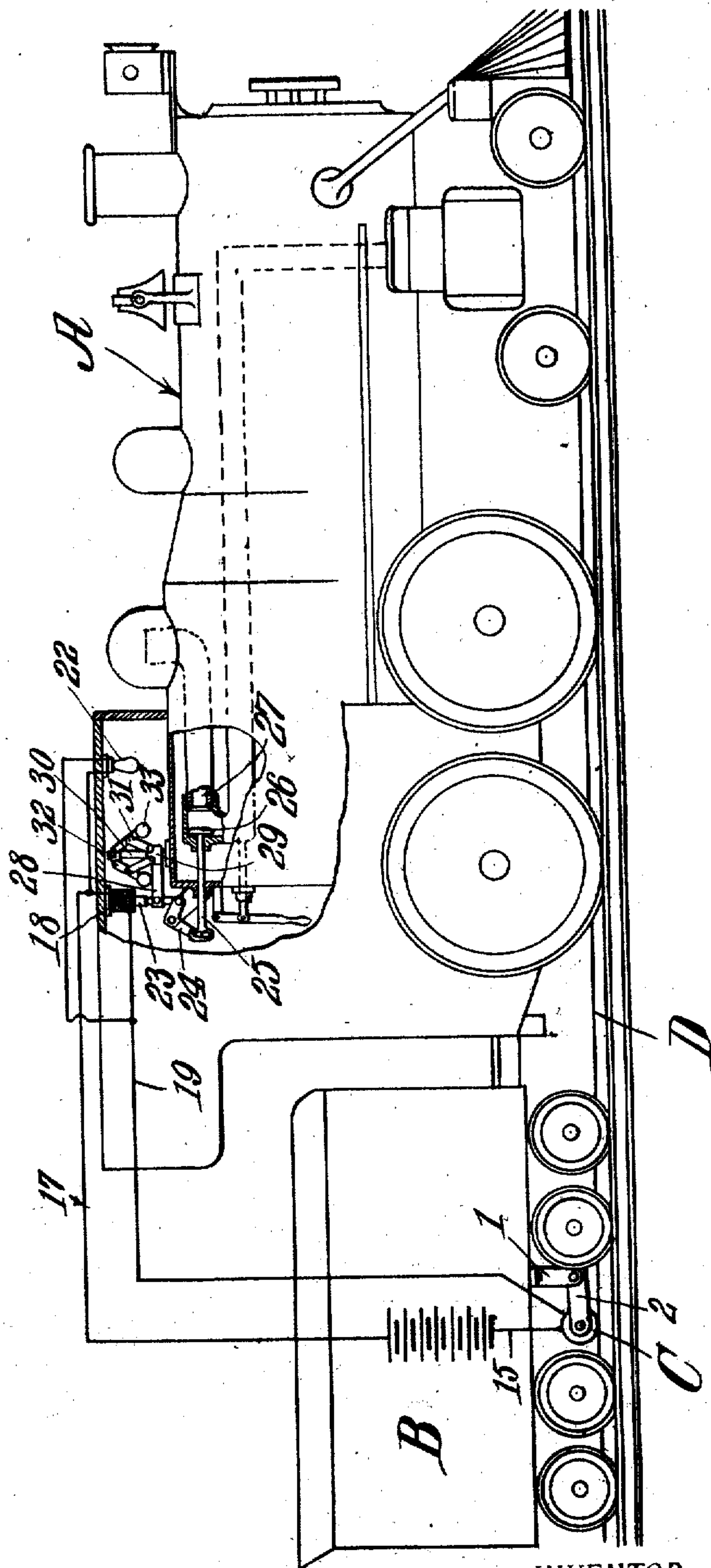
954,586.

F. PORTO.  
AUTOMATIC SIGNAL DEVICE.  
APPLICATION FILED MAR. 19, 1909.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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3 SHEETS-SHEET 2.

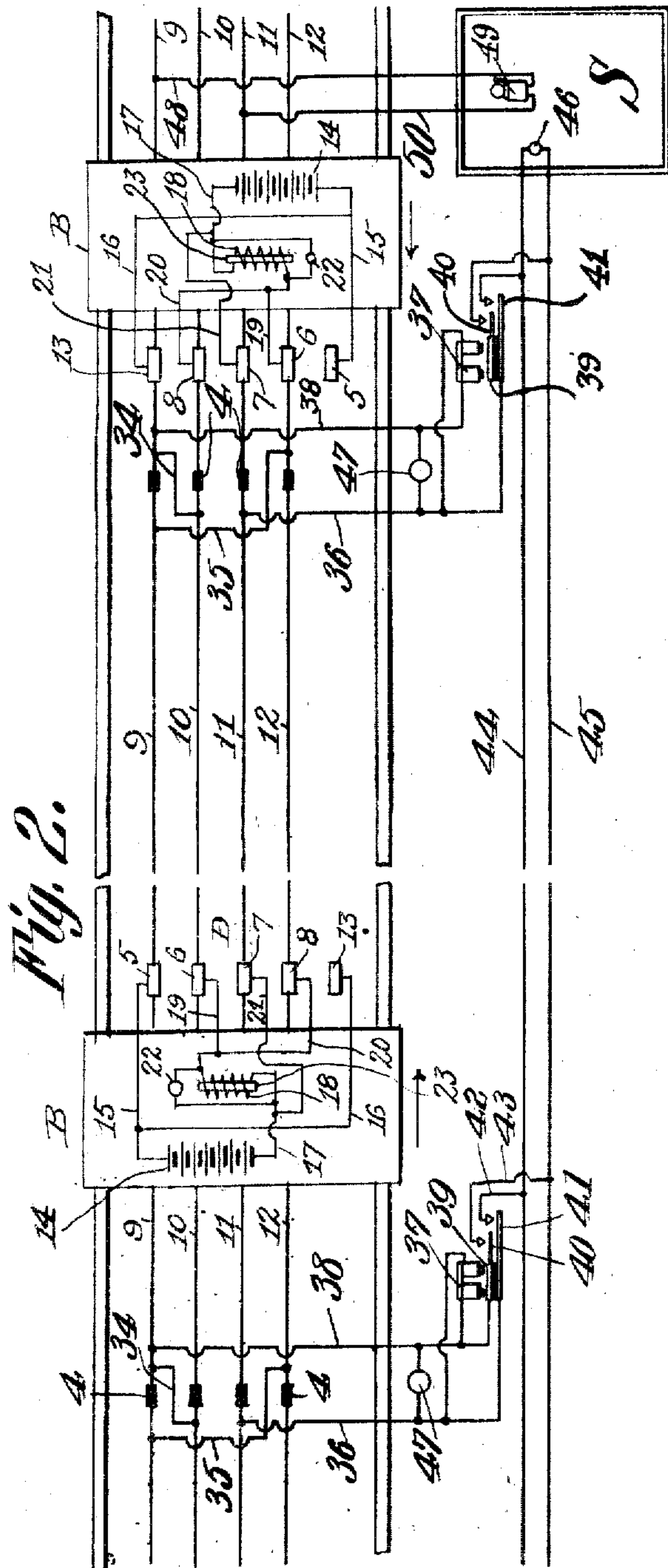


Fig. 2.

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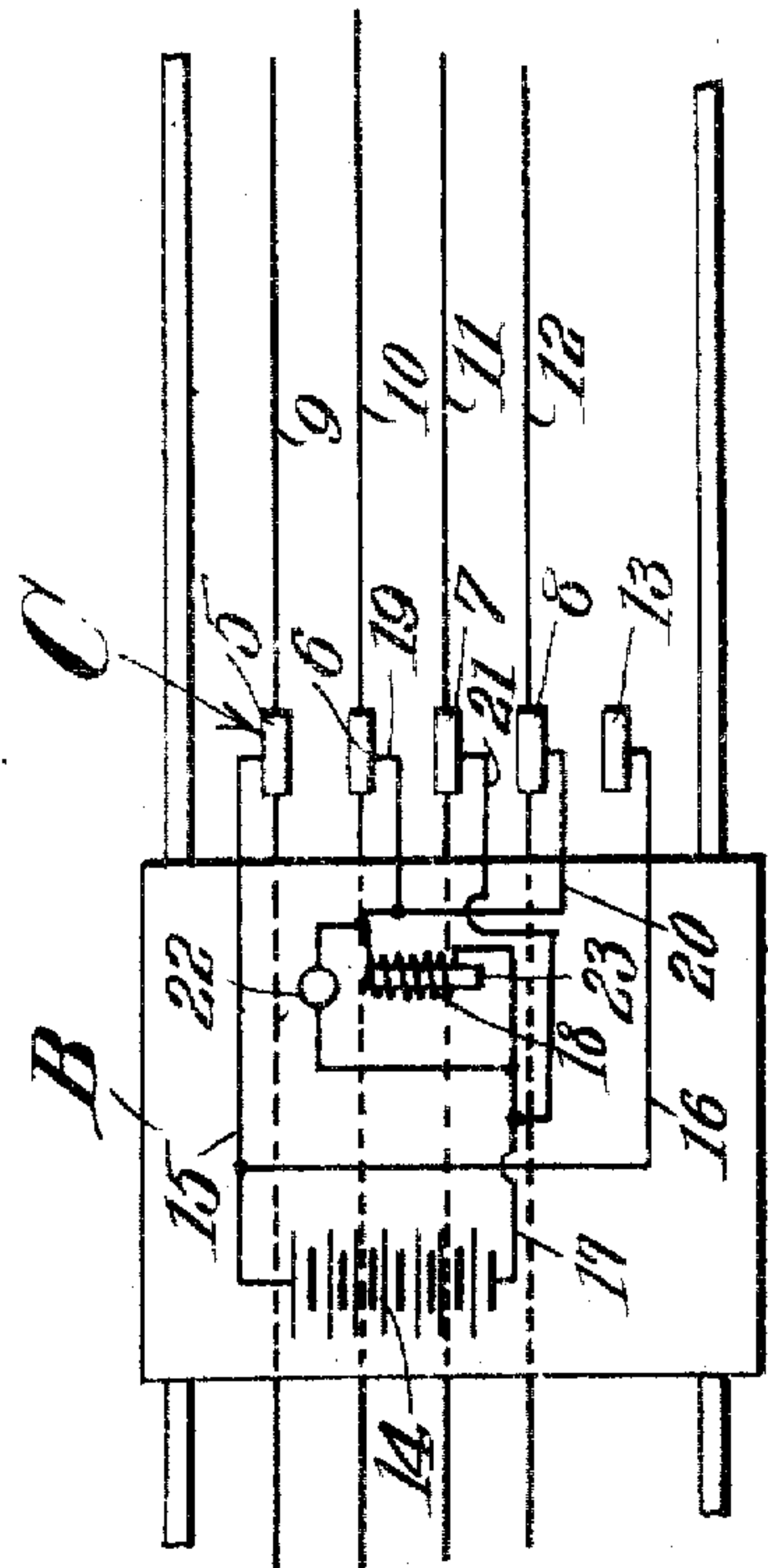


Fig. 3.

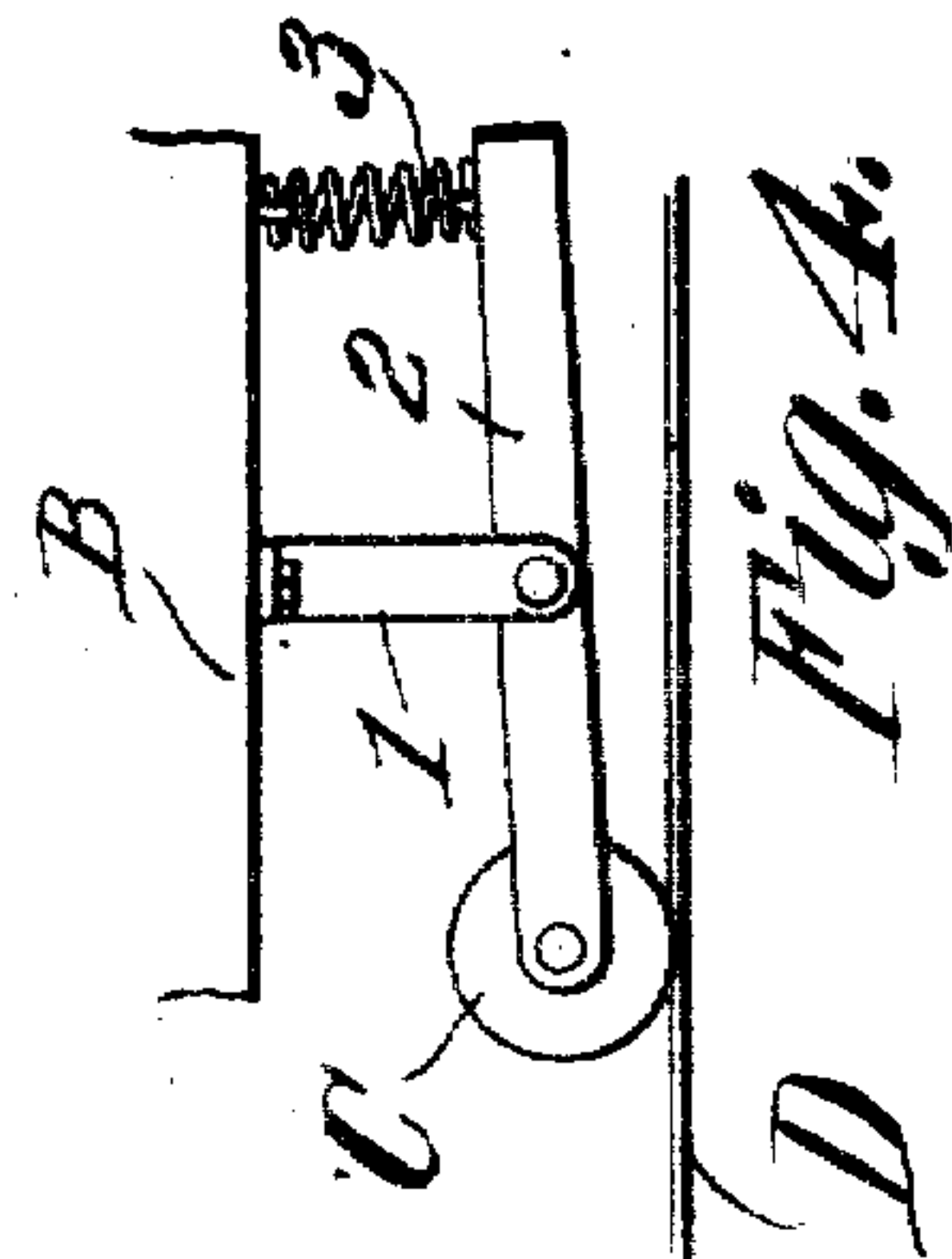


Fig. 4.

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3 SHEETS—SHEET 3.

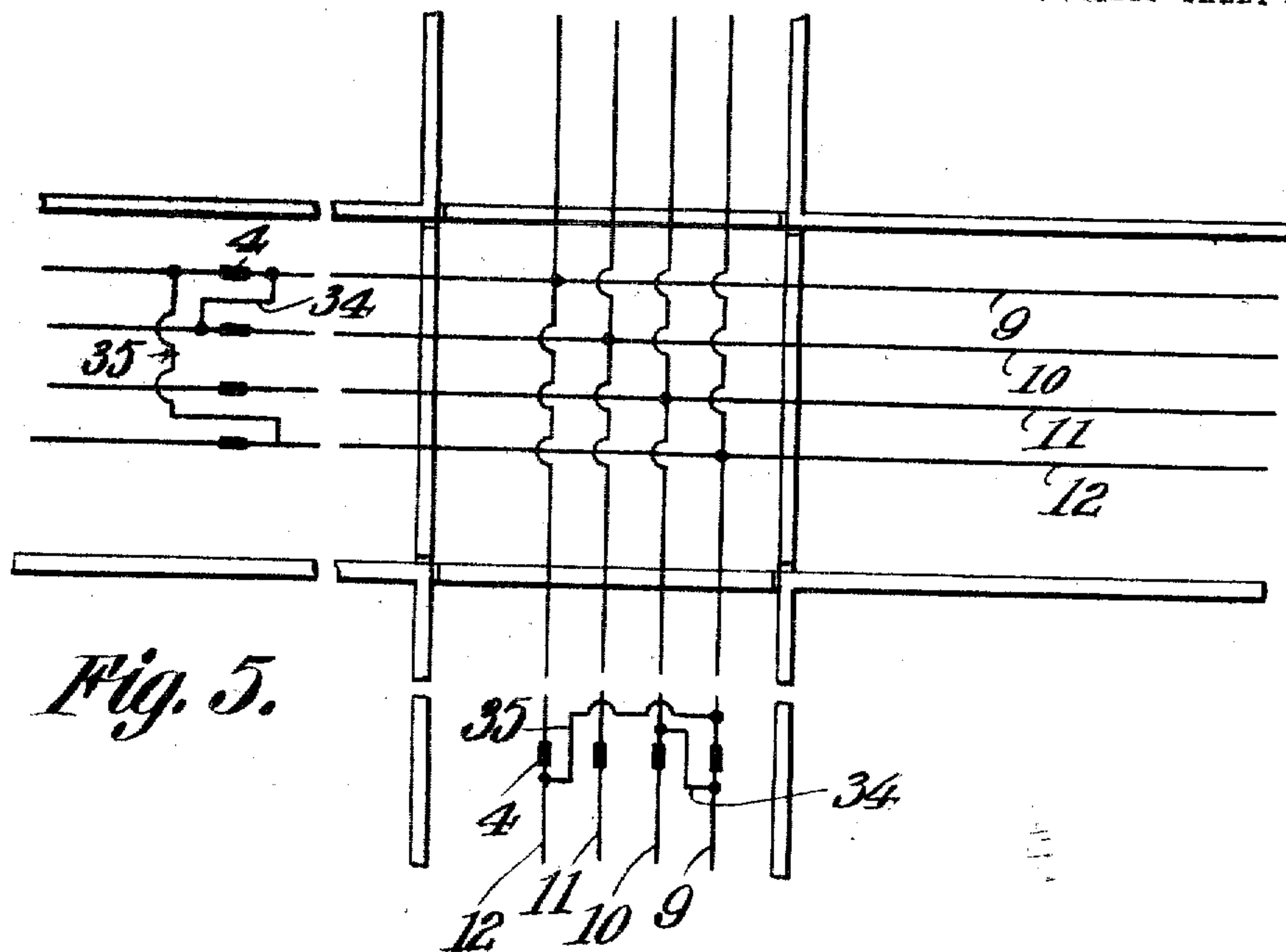


Fig. 5.

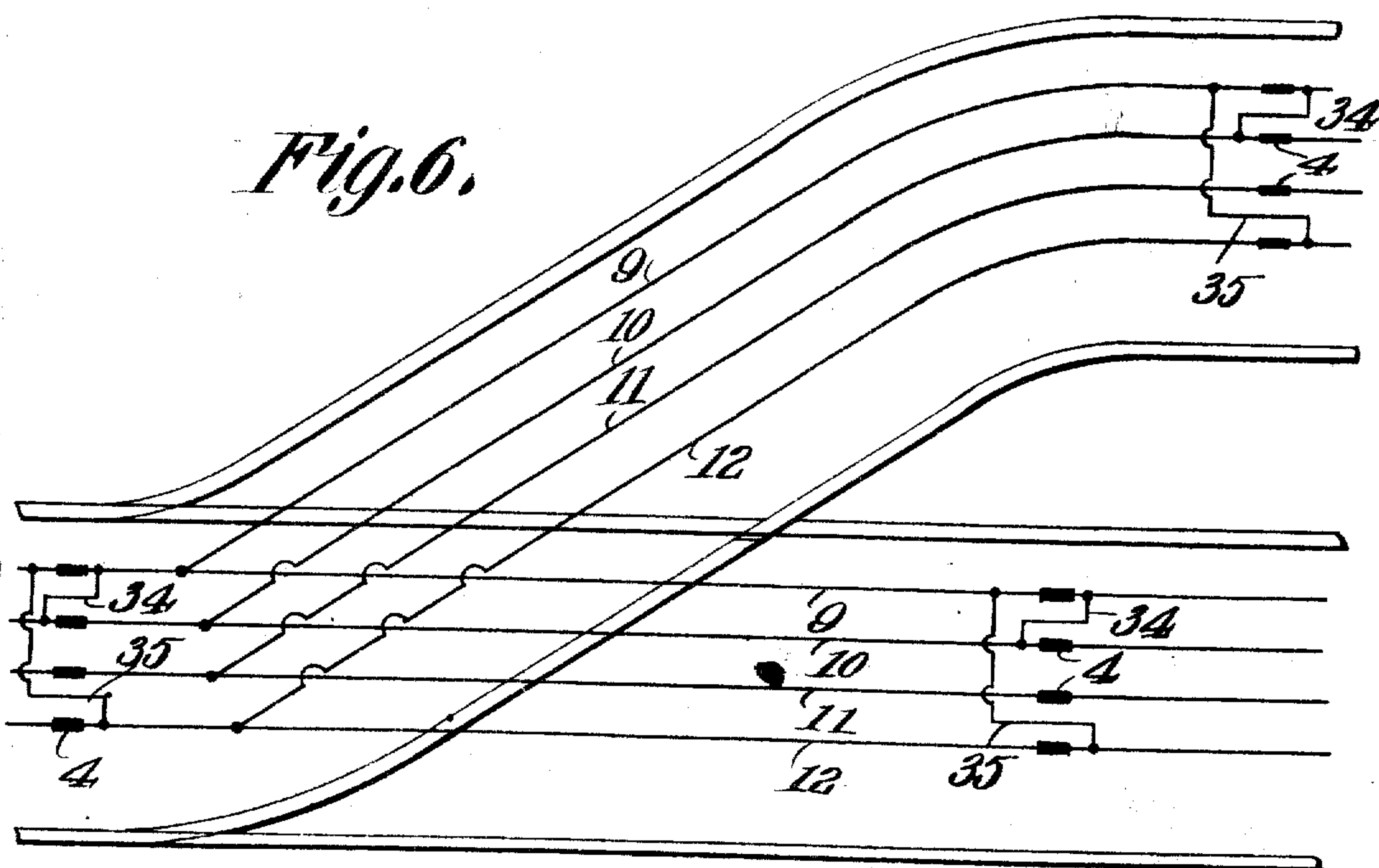


Fig. 6.

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# UNITED STATES PATENT OFFICE.

FRANK PORTO, OF BALTIMORE, MARYLAND.

## AUTOMATIC SIGNAL DEVICE.

954,586.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed March 19, 1909. Serial No. 484,349.

To all whom it may concern:

Be it known that I, FRANK PORTO, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Automatic Signal Devices, of which the following is a specification.

This invention relates to automatic signaling devices as applicable to a railway block system designed to be operative to stop a moving train or to check the movements thereof, or otherwise warn the engineer, with certainty, whenever a train moves into an adjacent track section or block within which a train may be either running or stopped at any given time.

The invention has for its further object to automatically apply the brakes and bring the train to a standstill without any action on the part of the engineer and prevent the train to pass into a block occupied by another train, at the same time notifying the operator in a station or tower of the close proximity of the train.

The invention further consists of certain novel features of construction and combinations of parts which will be hereinafter described and pointed out in the claim.

Figure 1, is a side elevation equipped with my invention, there being parts broken away and parts in section; Fig. 2, is a diagram of a railway system equipped with my invention; Fig. 3, is a diagram of the wiring between the fixed conductors and those located on the engine and tender; Fig. 4, is a side elevation of one of the rolling contact members; Fig. 5, is a diagram of the device as applied at road crossings, and Fig. 6, is a view similar to Fig. 5, but illustrates the method of wiring a switch or spur track.

In the drawings A indicates a locomotive, the tender of which is indicated by the letter B, hung from said tender by suitable brackets 1 are a plurality of levers 2, carrying at one end contact members C in the form of wheels or rollers, the other end of said levers being under the control of a torsion spring 3 tending at all times to hold the members C in contact with electrical conductors D constructed along the line of way as diagrammatically shown in Figs. 2 and 3, and as also shown in Fig. 2, the said conductors are divided into sections or "blocks" of required lengths.

The several conductors D extend throughout the length of the block and are there

broken by insulators 4. As hereinbefore stated, the levers 2 each carry a rolling contact member indicated at 5, 6, 7 and 8, and when the locomotive is traveling in the direction indicated by the arrow in Fig. 3, a contact 13 remains inoperative, but when traveling in the opposite direction the roller 13 contacts with the conductor 9, the roller 5 then being inoperative. The member 7 and conductors 11 being located in the center of the tender and track respectively, are constant in either direction.

Located at some convenient point either on the locomotive or tender as diagrammatically shown in Fig. 3, is a source of electrical energy, in the present instance a battery 14 is shown by way of illustration, one pole of said battery being connected to the contact 5 by a conductor 15, a branch 16 leading to the contact 13. From the other side of the battery 14 a conductor 17 leads to one side of a solenoid coil 18 and from the other side of the coil a conductor 19 leads to the contact 6, a branch 20 leads from conductor 19 to the contact 8, and a branch 21 leads from conductor 17 to the contact 7. It will thus be seen that the rolling contacts 6 and 8 are connected to one side of the solenoid 18. To attract the engineer's attention, should two locomotives occupy the same block at once, a lamp 22 is cut in parallel with the solenoid 18, although a lamp is shown, it is to be understood that a bell, or both lamp and bell can be used for this purpose.

By reference to Fig. 1, it will be observed that the signal above referred to, as well as the solenoid coil, are located in the cab of the engine and that the core 23 of said solenoid is extended below the coil a short distance and, at its lower end is connected to one arm of a bell crank lever 24; the other arm of said lever is connected to a stem 25 of a throttling valve 26, located in the dry pipe 27 of the locomotive. Connected to the core 23 at a point above the bell-crank 24 is a horizontally disposed arm 28, rigidly connected to a slidable collar 29, mounted on a fixed standard or rod 30. A pair of gravity actuated toggle levers 31 are hinged at their lower end to the slide collar 29, and at their upper end to a collar 32, fixed to the rod 30. It will thus be seen that when the solenoid is energized and the core is attracted thereto, the weights 33 on said toggle levers will be elevated and the valve 26



will be closed and as soon as the solenoid is deenergized, the weights 33 will cause the core to gravitate downwardly, thus opening the valve 26.

5 As hereinbefore stated, the continuity of the several conductors 9, 10, 11 and 12 is broken at desired intervals; at these breaks the conductor 10 of one block and 9 of the next adjacent block are connected by a conductor 34; and the conductors 9 of the first named block, and 12 of the second, are connected by a conductor 35 for a purpose that will presently appear. The circuit is as follows:—With two trains in adjacent blocks, 15 and moving in opposite directions, a circuit will be established from conductor 9 in the left hand block, through roller 5 on the left hand cab, wire 15, battery 14, wire 17, solenoid 18 and lamp 22, through wire 19, 20 roller 6, conductor 10, wire 34 to conductor 9 in the right hand block, and thence by means of roller 13 on the right hand cab, which contacts with conductor 9 in its block, through battery 14 and solenoid 18 in said cab, through wire 20 to roller 6 and conductor 12, back to conductor 9 in the left hand block through wire 35, thus completing the cab circuits in both cabs, energizing their solenoids 18 and lights 22, and applying their throttle valves 26.

As it is desired to notify a station at some distant point should it occur that two trains are in adjacent blocks, a conductor 36 leads from the conductor 11 of one block to one side of a magnetic coil 37, and a conductor 38 leads from the conductor 9 of the next adjacent block to the other side of said magnet; connected in parallel with this magnet 37 is its armature 39 carrying a spring contact 40, and insulated from said armature and carried thereby is another spring contact 41, the adjustment of this device being such that when the magnet is energized and the armature is attracted, the contacts 40 and 41 will close the circuit through branch conductors 42 and 43 through a pair of line conductors 44 and 45, thence through a signal 46 either visible or audible, or both, located in a station S. This circuit is completed 50 as follows:—From conductor 11 in the left hand block, through wire 36, magnet 37, wire 38, conductor 9 in the right hand block, thence through roller 13 on the right hand cab, wire 16, wire 15, battery 14, solenoid 18, 55 wire 19, roller 6, conductor 12, wire 35 to conductor 9 in the left hand block, thence in a similar manner through roller 5, wire 15 and battery 14 in said cab, and from thence through wires 17 and 21 and roller 7 back to conductor 11 in the left hand block, thus completing the circuit through the armature 37, which in turn completes the circuit through signal 46.

When two trains are occupying adjacent blocks, means are provided for notifying the 65 engineman of the departure of the other train by putting a lamp or bell 47 in parallel circuit with the magnet 37, so that when said lamp ceases to glow either engineman may know that that particular block has been 70 cleared. To announce the approach of a train to a station a conductor 48 is connected to the conductors 9, and passes through a bell 49 located in the station, thence by a conductor 50 to the conductor 11, so that 75 when a train enters on that block a current will be established through the conductors 48 and 9 through the contact 5 through the conductor 15, battery 14, conductors 17 and 21 to contact 7, thence through conductors 80 11 and 50 to the bell.

Slight changes and alterations might be resorted to in the form and arrangement of the several parts herein described, without departing from the spirit and scope of my 85 invention, hence I do not wish to limit myself to the exact construction as herein set forth; but,

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

In an automatic signaling device, the combination with a track, and a vehicle to run thereon, a plurality of electrical conductors constructed along the line of track 95 in parallel relation and insulated in blocks, a plurality of contact members in excess of the number of conductors suspended from said vehicle, one of said conductors being arranged centrally of said track, and said 100 contact members so arranged with respect to said conductors that certain of said contact members will contact therewith with the vehicle disposed in one direction and have one idle contact member on one side, 105 and will reverse said contacts from said central contact member when said vehicle is reversed and have one idle contact member on the other side, a source of electric energy on said vehicle, connections between said 110 source of energy and said contact members, electrically operated signal devices located within said vehicle and included in said connections, and connections between certain conductors of each block and certain 115 conductors of an adjacent block whereby when similarly equipped vehicles are in adjacent blocks circuits will be closed between the two vehicles and the signal devices operated.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK PORTO.

Witnesses:

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ARISTIDE W. GIEMPETTRO.