

No. 719,932.

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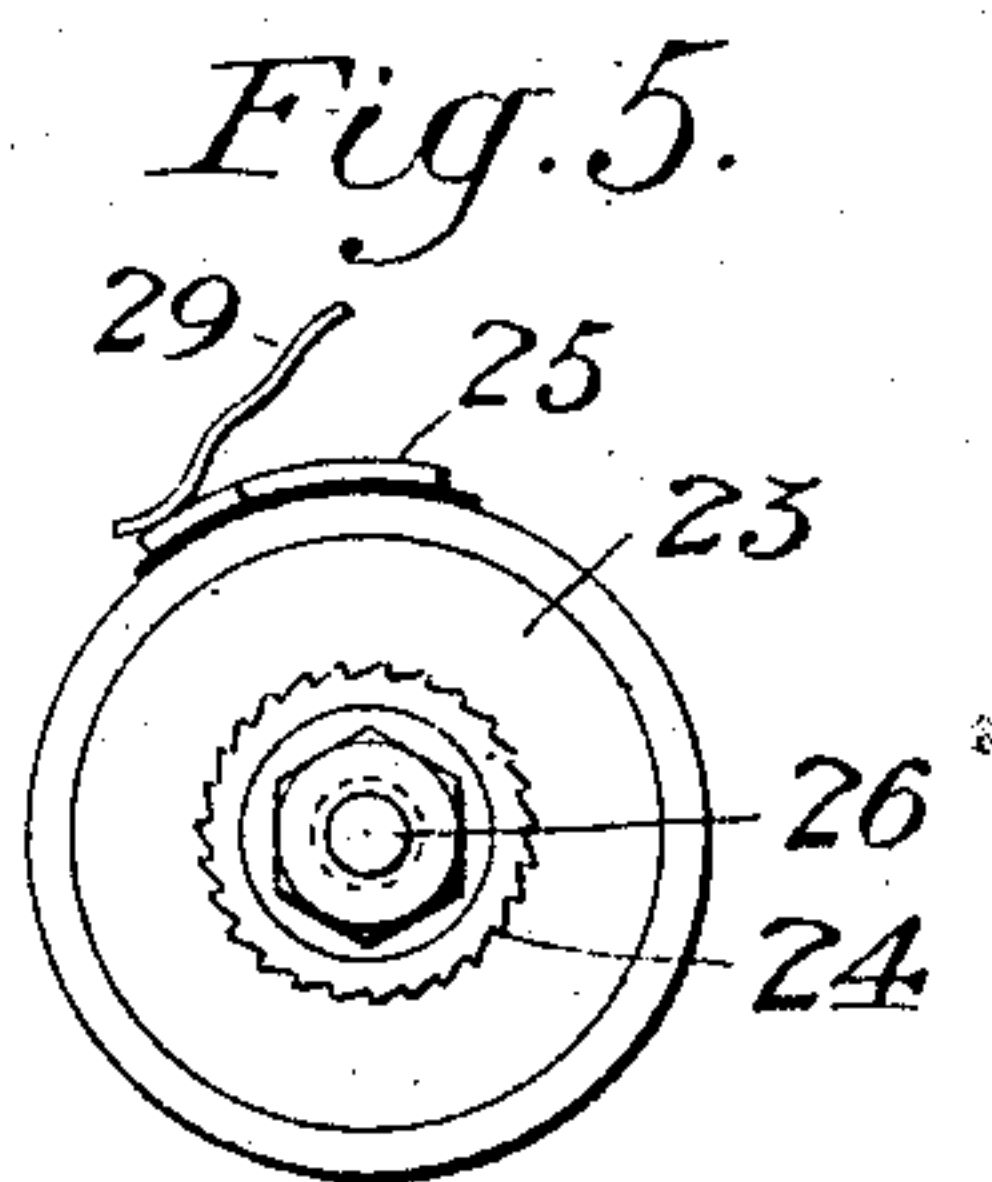
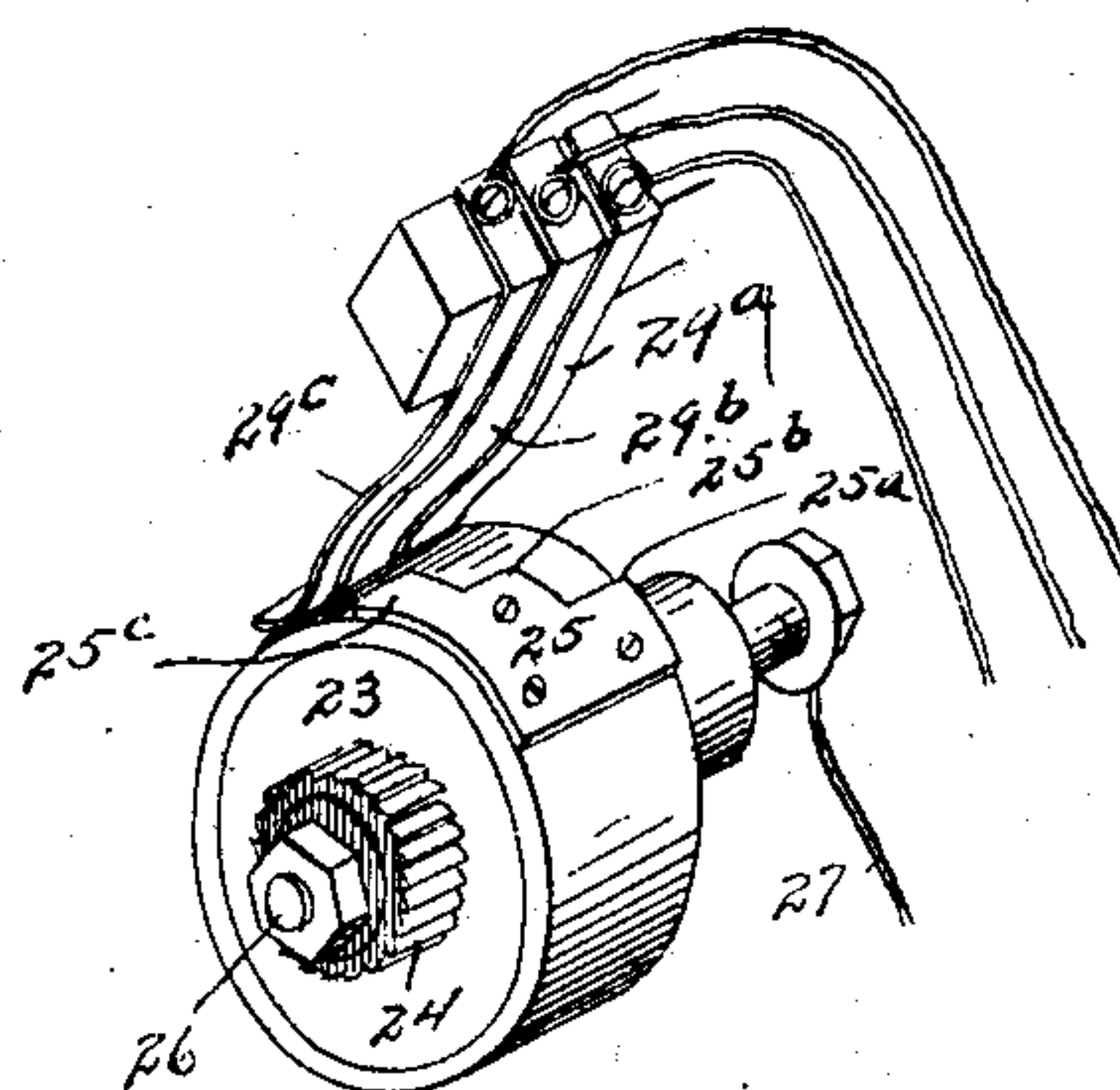
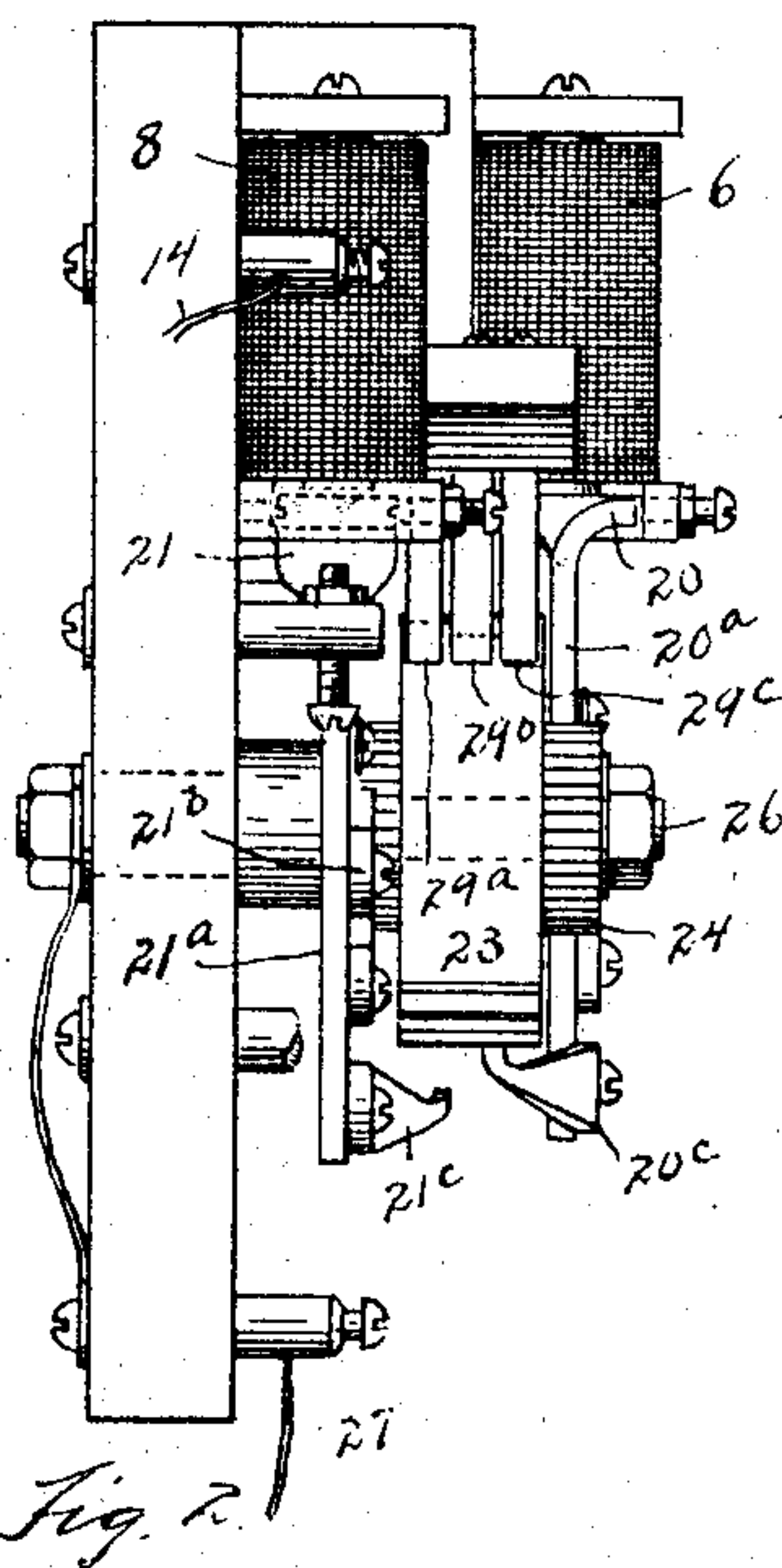
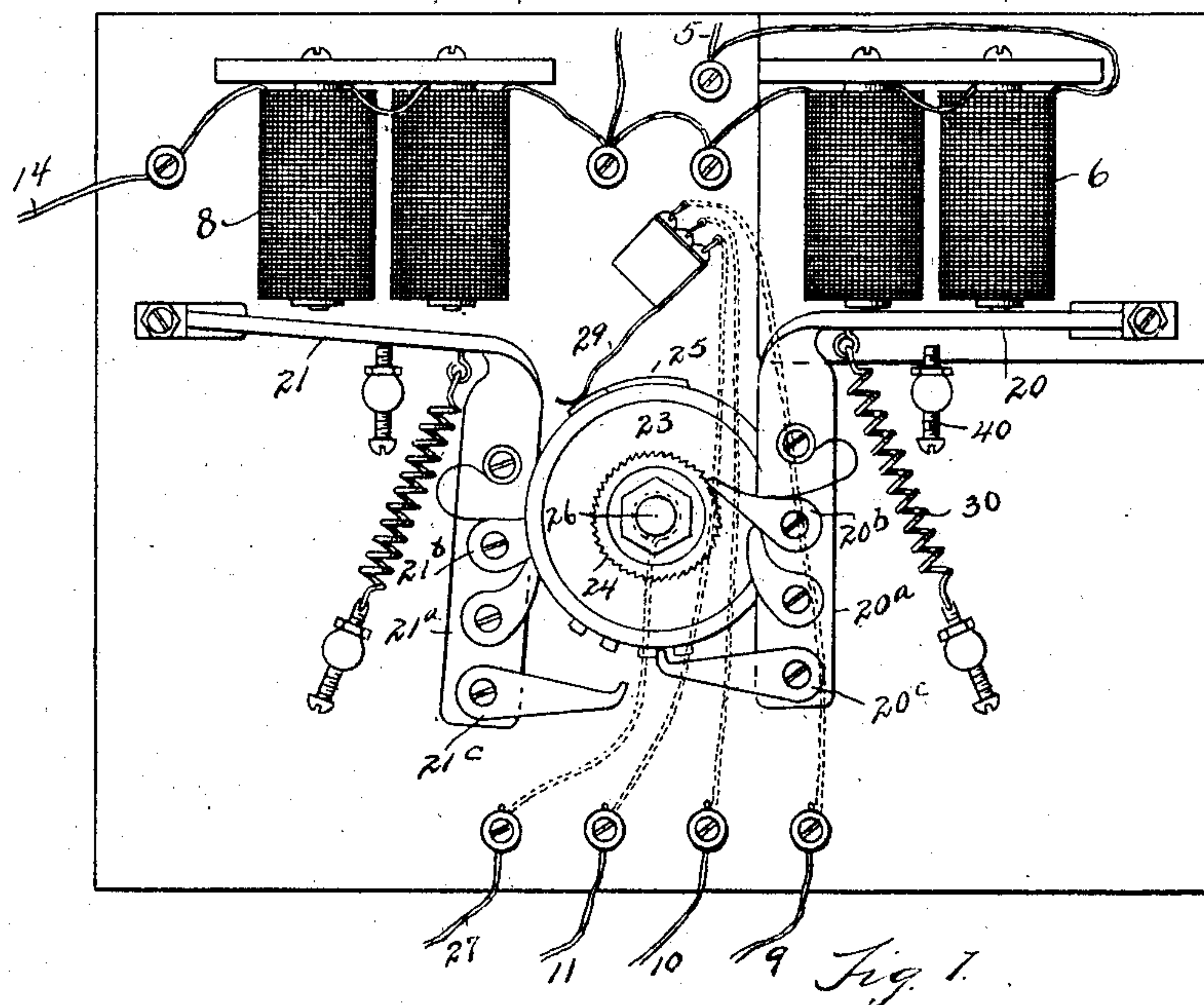
C. P. BASS.

DANGER SIGNAL FOR RAILWAYS.

APPLICATION FILED JAN. 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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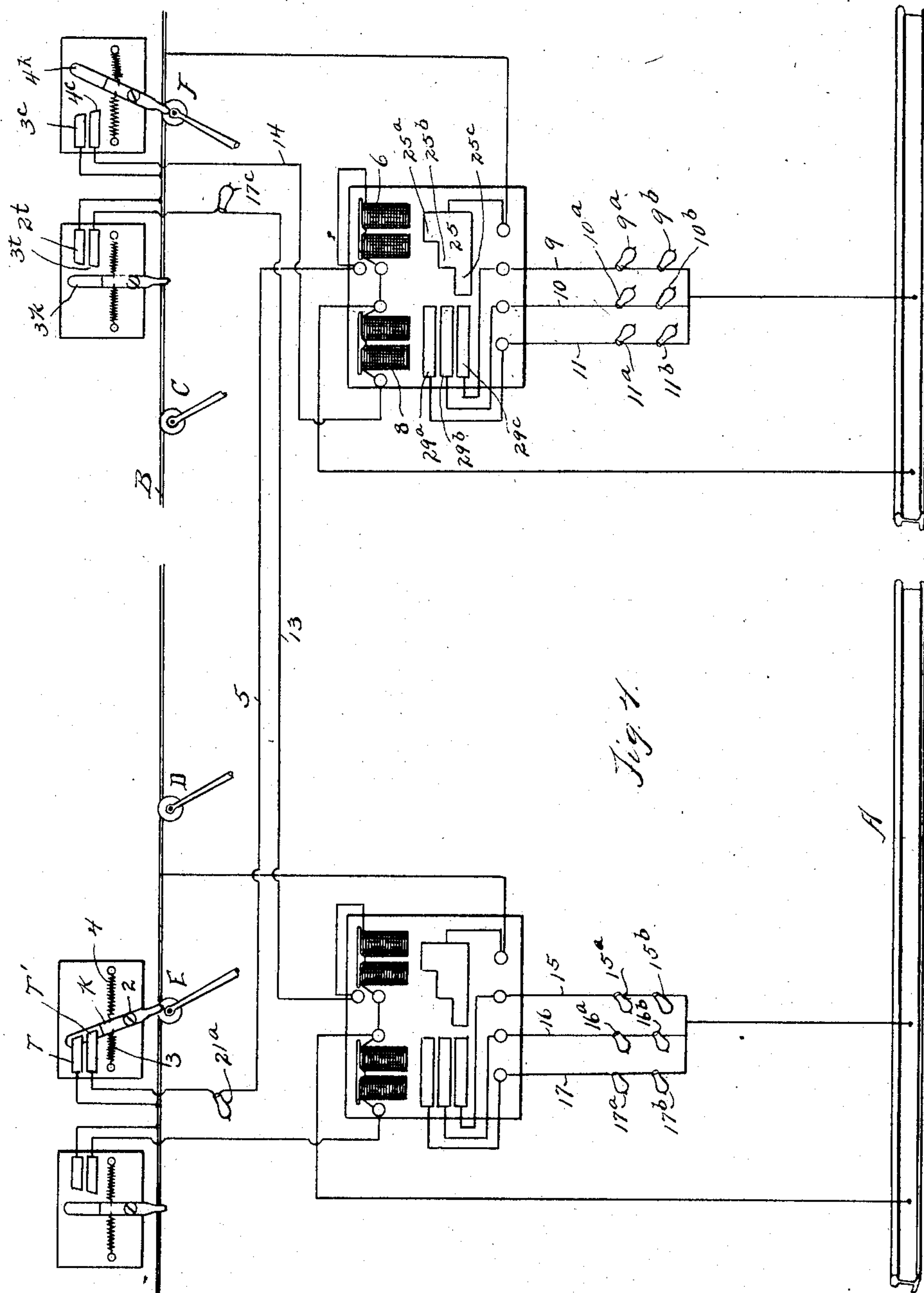
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UNITED STATES PATENT OFFICE.

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DANGER-SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 719,932, dated February 3, 1903.

Application filed January 25, 1902. Serial No. 91,170. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. BASS, a citizen of the United States, residing at Portland, county of Multnomah, State of Oregon, have invented a certain new and useful Improvement in Danger-Signals for Railways; and I declare the following to be a full, clear, and exact description of the invention, such as it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a signal system for trolley-railways, and has for its object an improved signaling system by means of which the driver of a car entering upon a block may know from signal-lights that are arranged at the end of the block whether there is any car on the block which he is approaching or whether there is any number of cars up to the limit to which the signals are set. The railway-line is divided into sections or blocks, and each block is provided at each end with a number of signal-lights, of which one is turned on or illuminated upon the entrance of the first car upon the block. A second signal-light is brought into action upon the entrance of a second car upon the block. A third light is brought into action upon the entrance of the third car upon the block. When the first car leaves the block, one of the lights is put out of action. When the second car leaves the block, a second light is put out of action. When the third car leaves the block, the third light is put out of action. The number of signal-lights may be increased indefinitely; but with blocks of reasonable length it is thought that three separate signals indicating three separate cars on a block are sufficient for ordinary cases, and while I do not confine myself to that or any number it is thought that the number stated is sufficient for a full explanation of the theory of action of the device.

In the drawings, Figure 1 is a detail drawing showing the switch which is arranged to bring the signals into consecutive action, keep them in action so long as the several cars are on the block, and put out of action the lights consecutively as the cars leave the block. Fig. 2 is a view at right angles to Fig. 1 and

of the same switch device. Fig. 3 is a detail perspective of the connector of the device of Fig. 1. Fig. 4 is a diagrammatic view showing the operation of the system. Fig. 5 is an elevation of the drum mechanism.

A indicates the track-rail; B, the trolley-line; C, the trolley-wheel of car No. 1; D, the trolley-wheel of car No. 2; E, the trolley-wheel of a car traveling in the opposite direction. Above the line, at the end of the block, is placed a pair of switch-terminals T and T' and at the opposite end of the block a similar pair of switch-terminals 2^t and 3^t. A connector *k* hangs in the path of the trolley-wheel in position to be swung on its pin 2, and when swung on its pin by the trolley-wheel it is brought temporarily into closing connection between the terminals T and T'. Immediately after the trolley-wheel passes it it swings from the terminals and assumes a vertical position out of contact with either. It is normally held in this vertical position by the springs 3 and 4. From the terminal T there is a line-wire 5 running the length of the block and at the distant end of the block passing to and around a magnet 6, thence to the rail A, complete the circuit through the track and to the trolley-wire through the power-house. When the connection is made between T and T' and the magnet 6 actuated, the armature of the magnet actuates a light-switch, the details of which are shown in Fig. 1, and brings the light-switch into position to shunt a current through the line-wire 9 and through the two signal-lights 9^a and 9^b. (Two signals are shown on each wire, indicating that the lights may be arranged in series to meet the destructive action of the high-voltage current on ordinary incandescent lamps.) Should another car enter upon the block, actuating the lever *k*, a second impulse is given to the light-switch of Fig. 1, and signal-lights are brought into action on the line 10, showing the two lights 10^a and 10^b, while the lights 9^a and 9^b are still burning, provided the first car has not left the block. (If the first car has left the block, the lights 9^a 9^b will have been put out of action and will again be brought into action by the second car.) Should a third car en-

ter upon the block, the light-switch of Fig. 1 will be given another impulse and the line 11 brought into action and the lights 11^a and 11^b brought into action. As the car passes out of the block No. 1 onto block No. 2, actuating the connector 4^k, across the terminals 3^c and 4^c, a current is shunted from the wire through the line 14 around the magnet 8 and the light-switching apparatus actuated in the reversed direction, switching out one set of said lights and leaving two in their indicating condition, showing that there are still two cars on the block. When the second car passes the switch-hanger 4^k, it switches out of action the two lights 10^a and 10^b and the third car switches out of action the lights 9^a and 9^b. When the car enters the block and makes the shunt connection, there is a flash through the light 21^a on the line 5. This is a mere temporary flash, indicating to the motor-driver that the light is acting properly. A trolley F coming from the opposite direction passes the terminal 3^c and 4^c without bringing the connector across them, but upon entering the block No. 1 actuates the connector 3^k, swinging it to connect 2^t and 3^t and bringing into action lights 15^a and 15^b on the line 15. A second car coming in the same direction will bring into action lights 16^a and 16^b on the line 16, and the third car coming in the same direction will bring into action lights 17^a and 17^b on the line 17. Each car that enters the block will flash the light 17^c on the line 13. The details of the light-switch employed to produce these results are shown in Figs. 1, 2, and 3, in which the magnets 6 and 8 are shown as having connected with them pawl-actuating armatures 20 and 21, and mounted between them in suitable bearings is a drum 23, on the shaft of which is a stepped metallic conductor 25, properly insulated from the body of the wheel, but connected through the shaft 26 with the line 27, that runs to the trolley-wire. Near to the wheel 23 is a brush 29, having three blades 29^a and 29^b and 29^c, one of which, 29^c, is arranged to contact with the more extended part 25^c of the stepped contact-piece 25, the second of which, 29^b, is arranged to contact the second or intermediate step 25^b of the contact-piece 25, and the third brush 29^a is arranged to contact the last or shortest step 25^a of the contact-terminal. The armature 20 is provided with a hanger 20^a, on which there is a pawl 20^b and a detent 20^c. When there is no current passing around the magnet 6, the armature and hanger drop under the tension of the spring 30 and the pawl 20^b drops out of engagement with the teeth of the ratchet-wheel 24. At the first impulse produced by the entrance of the first car on the block the armature and hanger rises and the pawl 20^b actuates the ratchet-wheel, rotating the wheel a distance to correspond with the drop of the armature, which is regulated by the adjusting-screw 40. This rotation brings the first or long step 25^c under the brush 29^c, making a shunt-current through

the line 27, through the step-piece 25, through the brush 29^c, thence through the line-wire 9, and to the rail A. The detent 20^c prevents an overthrow of the wheel and prevents vibration after the armature has raised. The second car entering upon the block produces another actuation of this light-switch, brings the intermediate step into contact with the brush 29^b, and lights the signal-lamps 10^a and 10^b. The signal-lamps 9^a and 9^b still remain lighted. The third car entering upon the block gives another impulse to the light-switch, brings the short step 25^a in contact with the brush 29^a, and lights the signal-lamps 11^a and 11^b. The opposite end of the drum of the light-switch 23 is provided with a ratchet-wheel, which in all respects is similar to the one already described, except that it is on the opposite end of the shaft and is arranged to actuate the wheel in the reverse direction. This ratchet is actuated by the hanger 21^a and by pawls 21^b and is provided with a detent-catch 21^c. When the first of the cars mentioned leaves the block and enters the next following block, the current shunted through line 14 around magnet 8 actuates armature 21 and the hanger 21^a and produces a reversed motion of the light-switch wheel and throws out of action the last one of the set of indicating-lights which has been brought into action, and the succeeding cars as they leave the block and enter upon block 2 produce further actuations of the switch in the same direction, each car as it leaves the block throwing out of action one set of signal-lights, and each car upon entering the second block will bring into action at the far end of the second block a system of lights exactly similar to the ones already described. It has not been thought necessary, however, to carry the diagram further, as the duplication of the parts already described to make a continuous block system would be easily understood.

This system of signaling makes an indication of danger at the far end of the block which indicates to the driver of an approaching car whether there is any car on the block before him and how many cars. Each car brings into action its own light, and each car cuts out a light, leaving in action as many lights as there are cars still remaining on the block.

What I claim is—

1. An electrosignaling means of the character described, comprising in combination with the trolley-wire, an electric line-circuit and a plurality of electric-light circuits, one or more lights in each of said electric-light circuits, a switch mechanism, including a rotator having a stepped contact member, a series of contacts for each set of lights, for engaging with said stepped contact member, electromechanical means for imparting intermittent motion to the rotator in electrical connection with the line-circuit, a switch in said line-circuit normally held open and in-

cluding a lever-arm projected on the path of the trolley adapted when engaged by the trolley to close in the line-circuit with the trolley-wire and energize the electromechanical means to bring into action the signal-lights, as set forth.

2. In an electric signaling means as described, the combination with the trolley-line B and the rail A; of an electric circuit 5 having its terminals joined with the rail and the trolley-wire B, a switch-lever in the circuit 5 automatically held to an open position and having a member projected in the path of the trolley to be engaged and shifted to a circuit-closing position thereby, one or more signal-lights, each in a subcircuit adapted to be connected with the electric circuit between the wire B and track A, a rotary light-switch including a stepped contact member for successively engaging the contact-terminals of the several light-circuits, means for imparting consecutive forward impulses to the rotary switch, said means including an electromagnet in the line-circuit having a pivoted armature, and actuating devices carried therewith, coöperatively joined with the rotary switch substantially as shown and described.

3. In an electric-lighting system as described, the combination with the trolley-wire 30 and the rail; of an electric circuit having its

terminals joined with the trolley-wire and the rail, an electric connector-lever in said circuit automatically moved to and held at an open position, and having an arm hanging in the path of the trolley, a series of signal-lights, a subcircuit for each set of lights in connection with the electric circuit between the trolley-wire and the rail, a rotary switch including a stepped contacting member for successively engaging the contact-terminals of the said subcircuits, an electromagnet and detent devices controlled thereby, actuated by the closing of the aforesaid electric circuit for effecting successive actuations of the rotary switch in one direction, and a second electric circuit joined with the trolley and the rail, a second electromagnet and detent devices, a second trolley-controlled electric connector for actuating the said second electromagnet, and detent devices controlled by the said second magnet for effecting reverse actuations of the rotary light-switch all being arranged substantially as shown and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES P. BASS.

Witnesses:

MAY E. KOTT,

CHARLES F. BURTON.