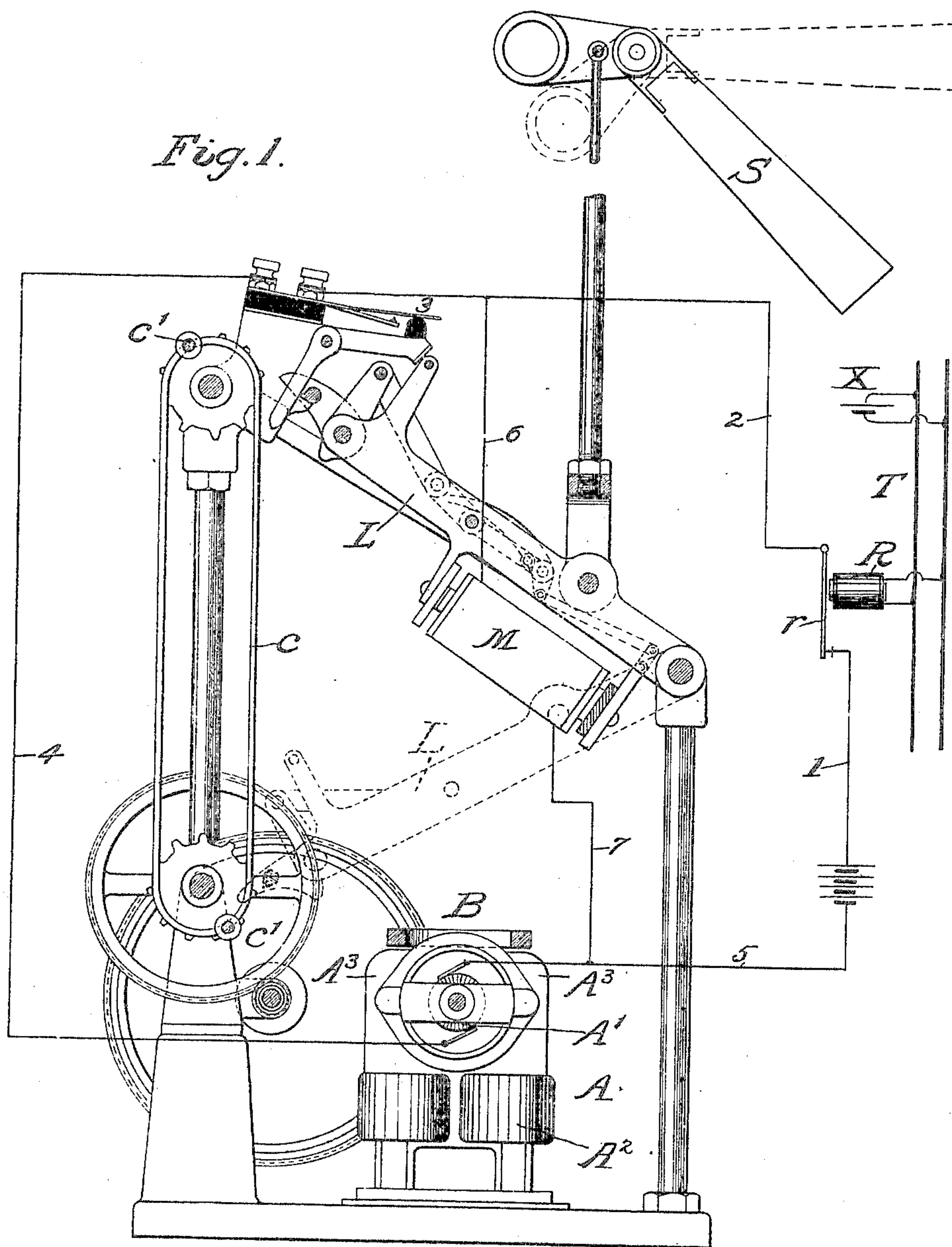


No. 797,783.

PATENTED AUG. 22, 1905.

V. K. SPICER.  
RAILWAY SIGNAL.  
APPLICATION FILED SEPT. 12, 1902

2 SHEETS—SHEET 1.



**WITNESSES:**

J. S. Johnson  
to W. Scovell.

**INVENTOR**

Vibe K. Spicer.

BY

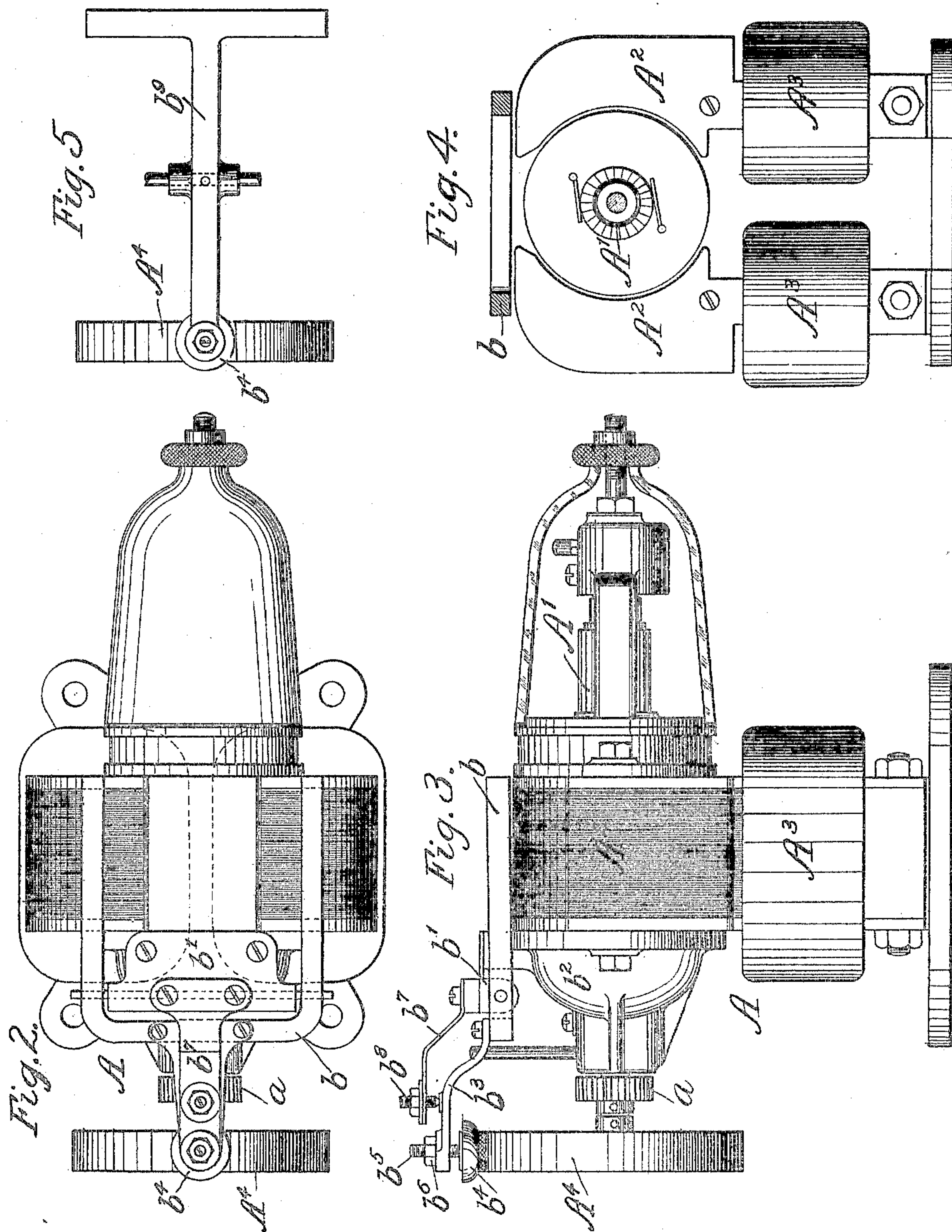
BY *[Signature]*  
HIS ATTORNEY

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2 SHEETS—SHEET 2.



**WITNESSES :**

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# UNITED STATES PATENT OFFICE.

VIBE K. SPICER, OF KENILWORTH, ILLINOIS, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## RAILWAY-SIGNAL.

No. 797,783.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed September 12, 1902. Serial No. 123,116.

*To all whom it may concern:*

Be it known that I, VIBE K. SPICER, a citizen of the United States, residing at Kenilworth, in the county of Cook and State of Illinois, have invented new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to railway-signals, and particularly that class of signals which comprise an electric motor for setting the signal device to give an indication of the service condition of the railroad-track or section of railroad-track which it governs.

I will describe a railway-signal embodying my invention and then point to the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a view, partly in vertical section and partly in elevation, of a railway-signal embodying my invention and showing diagrammatically a section of track and wiring in connection with the railway-signal. Fig. 2 is a top plan view of an electric motor embodied in the railway-signal of Fig. 1. Fig. 3 is an elevation of the electric motor shown in Fig. 1 and partly in section. Fig. 4 is an end elevation of the electric motor shown in Fig. 1 and partly in section. Fig. 5 is a detail top plan view of a modified form of brake used in connection with the motor.

Similar characters of reference designate corresponding parts in all the figures.

I will premise that wherever I use the term "railway-signal" I mean to include the visual or audible signal device which gives or is intended to give an indication of the service condition of the railroad-track and the apparatus or mechanism which operates or permits to be operated the visual or audible signal device. In the present instance the signal device is of the semaphore type, which, as it is well known, comprises a pivoted blade or arm to which a counterweight is connected. This type of signal device gives indications of the service conditions of the railroad-track during the day by its position relatively to its support and during the night by colors.

Referring now to Figs. 2, 3, and 4, A designates an electric motor; A', the armature thereof; A<sup>2</sup>, the field-pieces thereof, which preferably are laminated, and A<sup>3</sup> the field-coils surrounding the field-pieces A<sup>2</sup>. In this

type of motor the field-coils are in series with each other and with the armature. It will be well understood that when a current is sent through the field-coils and the armature the armature will rotate, and through the pinion *a*, fixedly mounted on the armature-shaft, rotary motion may be transmitted. At the same time the field-pieces will become magnetized, and I employ this magnetism to operate a brake, the action preferably being that when the field-pieces are magnetized the brake will be ineffective, but immediately the current is cut off from the motor field-coils and the field-pieces thereby demagnetized the brake will become effective.

B designates the brake in its entirety.

*b* designates a U-shaped metallic part which is pivoted to a plate *b'*, suitably secured to a casing *b<sup>2</sup>*, inclosing the armature A'. It will be seen that the members of part *b* extend over the field-pieces of A<sup>2</sup>, so that when the field-pieces A<sup>2</sup> are magnetized the members of the part *b* will be pulled down toward or onto the field-pieces, thereby, in effect, acting as an armature for the field-pieces.

*b<sup>3</sup>* designates a bracket, which is here shown as being detachably connected to the part *b*. If desired, the parts *b* and *b<sup>3</sup>* may be integral.

*b<sup>4</sup>* designates a brake-shoe which coacts with a wheel or pulley A<sup>4</sup>, fast on the armature-shaft. The brake-shoe is here shown as having a wearing-face of any suitable material.

*b<sup>5</sup>* designates a screw-threaded part carried by the brake-shoe which works in a screw-threaded opening in the bracket *b<sup>3</sup>*.

*b<sup>6</sup>* designates a lock-nut for the part *b<sup>5</sup>*. Adjustment of the brake-shoe is afforded by the parts *b<sup>5</sup>* and *b<sup>6</sup>*.

*b<sup>7</sup>* designates a spring, here shown as being a flat spring. One end of the spring is fastened to the plate *b'*, while its other end carries a pin or projection *b<sup>8</sup>*, which bears upon the bracket *b<sup>3</sup>*. The pin *b<sup>8</sup>* is adjustable in the end of the spring *b<sup>7</sup>*, so that the effect of the spring upon the bracket may be regulated.

Instead of using the U-shaped part *b<sup>2</sup>* as the armature of the field-pieces I may employ a T-shaped part *b<sup>9</sup>*, as shown in Fig. 4, which is adapted to be pivoted intermediate its ends. Instead of using a spring to force the shoe onto the wheel A<sup>4</sup>, I may employ a weight.

Referring now to Fig. 1, I have illustrated



a railway-signal substantially the same in construction and operation as that shown in United States Patent No. 611,943, granted to J. G. Schreuder October 4, 1898, the principal difference being that in the present improvement the motor actuates only one arm and the lever for moving the signal device to the position indicating clear directly acts upon the switch or circuit-breaker to open the circuit through the motor. T designates a section of railroad-track having at one end a battery X and at its other end a relay-magnet R, which, as usual, is in circuit with the battery X through the rails of the track-section. r designates an armature for the relay-magnet R, which is adapted to close a circuit through the electric motor comprised in the railway-signal, and M a magnet which controls a system of levers (see the patent referred to) for holding the lever connected with the signal device in an elevated position at one time and for permitting it to fall at another time. The circuit for the motor, starting from the battery X', is wire 1, armature r, wire 2, switch or circuit-breaker 3, wire 4, motor A, and wire 5 to battery. The circuit for the magnet M, starting from the battery X', is wire 1, armature r, wires 2 and 6, magnet M, and wires 7 and 5 to battery. It will be seen that the armature r is in with circuits and that when not attracted to the armature it opens the circuits through the motor and magnet. S designates a signal device, here shown as being of the semaphore type. As is usual in this type of signal device, it is biased to one position of indication—that is, it is counterweighted, so that when free to move the counterweight will move it to a position of indication, generally to the position indicating danger.

The operation of a railway-signal and its automatic control by the passing of a train over the track-section it governs is as follows: With the parts in the position shown in full lines in Fig. 1 the signal device is in a position indicating clear. In this position it will be observed that the lever L of the apparatus is in its raised position, being moved to such position by the motor and chain c, carrying projections c', which coact with the lever L. It will also be observed that the chain, by reason of the brake B acting to stop the armature of the motor when its circuit is broken at 3, is stopped in such a position as to bring a projection c' in position to again lift the lever L when it falls to the position indicated in dotted lines. This would not be the case were no brake applied to the motor. On the contrary, the armature would have sufficient momentum to operate the chain through the intermediate gearing to carry a projection c' beyond the required position. Hence when the motor again started it would have to run some time before becoming effective to oper-

ate the signal device, thus unnecessarily wasting time and battery-power.

The operation of the railway-signal by the passage of trains over the track-section which it governs is too well known to require explanation.

The advantages of employing a brake for the motor operated through the field of the motor will be obvious to those skilled in the art.

What I claim as my invention is—

1. In a railway-signal, the combination of a signal device having a bias to one position of indication, an electric motor; means comprising a chain carrying projections, operated by said electric motor for moving said signal to another position of indication; a brake-wheel carried on the armature-shaft of the said electric motor, a brake for said electric motor having two arms or prongs adapted to be attracted respectively by the two poles of the motor when the said motor is cut into circuit, and a spring or weight acting to apply the said brake to the brake-wheel when the motor is cut out of circuit and thereby to stop said chain in a position to be immediately effective when operated again.

2. In a railway-signal, the combination of a signal device having a bias to one position of indication, an electric motor and means operated by the electric motor to move the signal against its bias, a brake-wheel carried on the armature-shaft of the said electric motor, a brake for said electric motor having two arms or prongs adapted to be attracted respectively by the two poles of the motor when the said motor is cut into circuit, and a spring or weight acting to apply the said brake to the brake-wheel when the motor is cut out of circuit, a circuit for said motor, and a track-circuit controlling the circuit of the motor substantially as described.

3. In a railway-signal, the combination of a signal device having a bias to one position of indication, an electric motor included in a circuit adapted to be opened and closed, means operated by the electric motor for moving said motor from the biased position of indication to another position of indication, a brake-wheel carried on the armature-shaft of the said electric motor, a brake for said electric motor having two arms or prongs adapted to be attracted respectively by the two poles of the motor when the said motor is cut into circuit, and a spring or weight acting to apply the said brake to the brake-wheel when the motor is cut out of circuit.

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

VIBE K. SPICER.

Witnesses:

B. WALLACE,  
E. T. BARNES.