

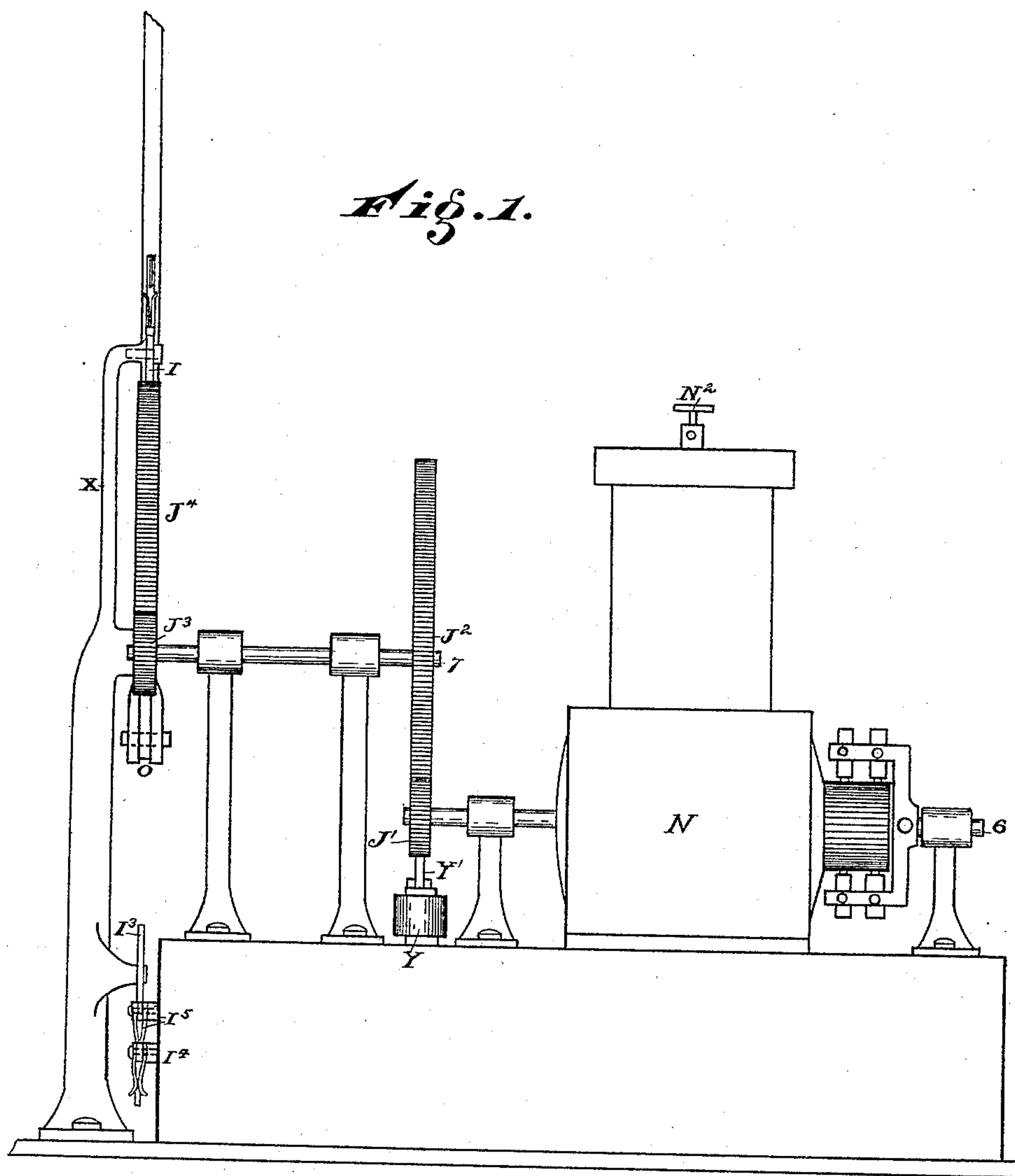
(No Model.)

3 Sheets—Sheet 1.

J. RAMSEY, Jr. & F. C. WEIR.
ELECTRIC SWITCH AND SIGNAL MECHANISM.

No. 440,503.

Patented Nov. 11, 1890.



Attest
F. Simmons
Wm. H. Ross.

Inventors
Joseph Ramsey Jr.
Frederic C. Weir
by Wood & Boyd
their Attorneys &c.

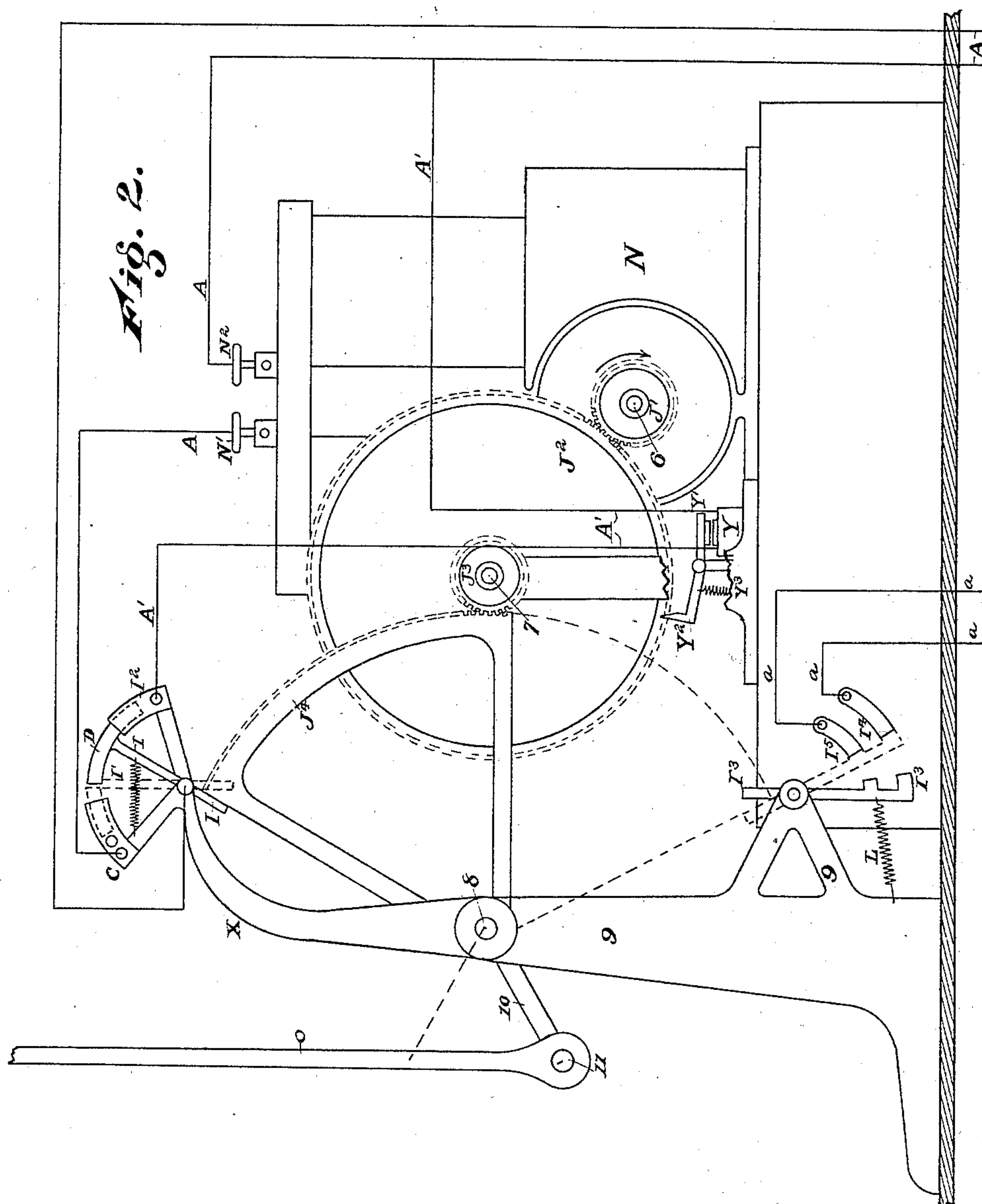
(No Model.)

3 Sheets—Sheet 2.

J. RAMSEY, Jr. & F. C. WEIR.
ELECTRIC SWITCH AND SIGNAL MECHANISM.

No. 440,503.

Patented Nov. 11, 1890.



Attest
T. Simmons
Wm. T. Ross.

Inventors
Joseph Ramsey Jr.
Fredric C. Weir
by Wood & Boyd
their Attorneys &c.

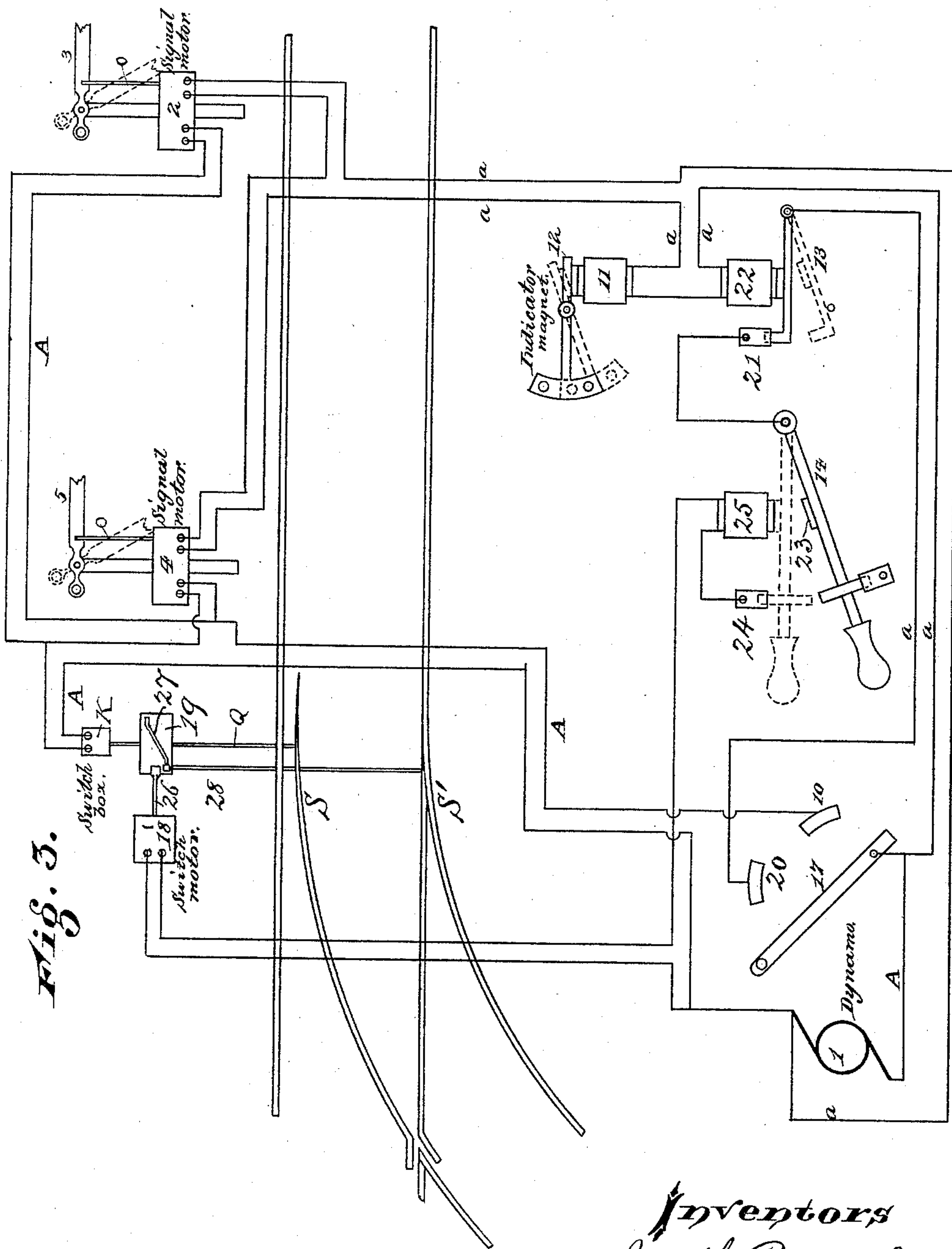
(No Model.)

3 Sheets—Sheet 3.

J. RAMSEY, Jr. & F. C. WEIR.
ELECTRIC SWITCH AND SIGNAL MECHANISM.

No. 440,503.

Patented Nov. 11, 1890.



Attest
J. Simmons
Wm. F. Ross.

Inventors
Joseph Ramsey Jr.
Fredric C. Weir
by Wood & Boyd
their Attorneys, &c.

UNITED STATES PATENT OFFICE.

JOSEPH RAMSEY, JR., AND FREDRIC C. WEIR, OF CINCINNATI, OHIO.

ELECTRIC SWITCH AND SIGNAL MECHANISM.

SPECIFICATION forming part of Letters Patent No. 440,503, dated November 11, 1890.

Application filed March 21, 1889. Serial No. 304,152. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH RAMSEY, JR., and FREDRIC C. WEIR, citizens of the United States, and residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Electric Switch and Signal Mechanism, of which the following is a specification.

Our invention relates to a system of signals designed to be used on railroads.

The objects of our invention are, first, to provide a motor by which the signals can be moved by the driving mechanism of the motor; second, to so arrange the driving apparatus that the signals may be moved, say, from "danger" to "safety," and the motor will be automatically cut out while the signal will be held by a magnet until it is desired to break the circuit and the signals be automatically returned to "danger," and, third, to provide a magnet for holding the signals to the safety-point by cutting the magnet in circuit when the motor is cut out of circuit and holding the signal in that position until the circuit is broken by the operator at the distant station, or by other mechanism—such as the movement of the switch or switches—which may be connected with the signal-circuit shown in Letters Patent granted to us June 3, 1890, No. 429,478, when the signals will automatically return to "danger."

Another object of our invention is to provide an indicator-magnet armature in the circuit at the station, so that the position of the signal will be indicated by the position of said armature at the signal-station.

The preferred form of constructing said apparatus and arranging the signal or signals inserted is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the driving-motor and connections to the signal-rod. Fig. 2 is an end elevation of the same. Fig. 3 is a diagram showing connections for the same in circuit with the ordinary electric generator and switch-connections.

1 represents a dynamo.

2 represents a signal-motor box; 3, a signal-blade.

4 represents a signal-motor box similar in construction to box 2.

5 represents a signal-blade corresponding

to the signal-blade 3. We have shown two because it is customary to use a distant and home signal, and these are connected in parallel circuit.

In Fig. 1, N represents an ordinary electric motor. N' and N² represent the binding-posts connecting said motor and circuit. 6 represents the main shaft, on which the motor journals.

J' represents a gear-wheel keyed to said shaft, meshing with the gear J², which is keyed upon shaft 7.

J³ represents another gear, keyed likewise upon said shaft, its teeth meshing with those of the segmental gear J⁴, which is secured to shaft 8, journaling in the bracket 9, as shown in Fig. 2. If desired to reduce speed of movement of crank-arm, another shaft with gear-wheels can be added.

10 represents a crank-arm projecting from the segment J⁴.

11 represents a crank-pin, on which journals the connecting-rod O. When the motor is in circuit, the revolution of the shaft 6 drives the pinion J', transmits motion to pinion J² and to the shaft 7 and by pinion J³ to the segmental gear J⁴, pulling connecting-rod O down, in which position it is shown in Fig. 2, and which is the safety position of the signal. The motor is driven by a current flowing through the circuit represented by wires A.

The signals in Fig. 3 are shown at "danger," to which position they are automatically carried whenever the motor-circuit is broken. The object of the motor is to pull said signals down into the position shown in dotted lines, Fig. 3, or the safety position. It is also desired that the signals shall be held to "safety" by power, first, in case of derangement of switches or accidental breakage of the switch-connections, wires, &c., that they will automatically return to "danger" and prevent the passage of trains until they have been readjusted; second, that the operator may at will when the track is clear move the signals from "danger" to "safety" to allow the passage of trains; but it is necessary or desirable to have the motor cut out the circuit as soon as it has performed its work or moved the signals from "danger" to "safety," and still use the power of electricity to hold the signals in that position.

This we accomplish by means of the switch and a magnet operating an armature, said magnet being connected in parallel with the motor N in circuit A, and so connected that it will be cut out when the motor N is cut in, or vice versa. This is accomplished by means of the following instrumentalities: A' represents that branch of the circuit A carrying the magnet Y, which when in circuit attracts an armature Y', carrying a detent Y², engaging with the teeth of pinion J² and locking it against the descent of the signal, thereby holding it to "safety." When the circuit A' is cut out, either by movement of switches or by an attendant, magnet Y being demagnetized, the retractile spring Y³ pulls the detent out of contact with the teeth of J² and allows the signal-moving apparatus to be driven backward automatically by the weight of the signal, segment J⁴ coming into position shown in dotted lines. When the segment J⁴ goes into position shown in full lines it carries the switch-lever I by contact from the position shown in dotted lines into the position shown in full lines, Fig. 2, closing the circuit A', which magnetizes the magnet Y. When the segment J⁴ is pulled down by the weight of the signal into the position shown in dotted lines, the switch-lever I is drawn by the retractile spring I' into the position shown in dotted lines and out of contact with the terminal I², thus breaking the circuit A'. As the circuit-wires A are connected to the terminal C and D, one wire being connected to the shaft of lever I, the end of the segment D, carried by lever I, when in contact with the terminal C establishes the circuit-connections for the circuit A. This is indicated by dotted lines in Fig. 2; but when the said armature I and the segment-terminal D are held by the segment J⁴ in position shown in full lines the circuit A is broken. Thus the circuit A is broken by the upward or forward movement of the segment J⁴ and the magnet-circuit A' cut in by the opposite position of said switch-lever I, and the circuit A' is cut out and the circuit A cut in by the reverse movement of said segment I. The signal-blades 3 and 5 are shown supported on pivots on the signal-posts, and as the short end of said signals are weighted or made the heaviest the blade is overbalanced and it must be held, say, to the safety position shown in dotted lines, Fig. 3, by power. As the magnet is cut in circuit as soon as signal has been moved to "safety," the gears which would otherwise turn back are locked in position by the detent-armature Y'. In order that the signals may be automatically returned to "danger" at a time when no train is to pass, we provide an independent means for breaking said circuit. This circuit is established primarily at the station-house by the switch 17 being moved to come in contact with terminal 10. So long as said switch 17 is in contact with the terminal 10 the current is flowing either through the circuit A or the circuit A'—that is, it is either driving the motor or

magnetizing magnet Y. When it is desired that the signal shall be returned to "danger," the switch-lever 17 is moved, thereby breaking the circuit, when the signals will be returned to their normal position of "danger." Now it is desirable that the operator be in the signal-house controlling the dynamo or source of electricity, and also to have the switch 17 under his control while the signals are at a distance from the signal-house.

The indicator-magnet 11 is provided, which when magnetized draws the armature 12 into the position shown in full lines. This magnet is in a secondary circuit α , which circuit we have shown connected to dynamo 1. In order that this indicator may be operated by the signal mechanism, we provide a switch-lever I³, pivoted to the bracket 9, with the terminal contact-points I³ and I⁴, I⁵ and I⁶. When this switch-lever I³ is in the position shown in full lines, Fig. 2, the circuit is broken and the armature-indicator 12 in the signal-station is in position shown in broken lines, Fig. 3. The spring L holds said switch-lever I³ normally out of contact, and when the signal is at "danger" the segment J⁴ is in the position shown in dotted lines, Fig. 2, and in contact with the free end of the lever I³, holding its terminals in contact with terminals I⁴ and I⁵, establishing the indicator-circuit. The indicator in the circuit in the station shown in Fig. 3 will be up or in position shown in dotted lines. Thus the indicator-circuit and the indicator 12 are controlled through the switch I³ by the movement of the signal apparatus whether the switch 17 be in connection with the terminal 10 or otherwise by the independent circuit α .

18 is the switch-motor box.

19 is a cam-plate reciprocated by the switch-motor for moving the switch-rails.

20 is a switch contact-point for the lever 17.

13 is an armature making contact with the terminal 21 and held in position by the magnet 22 when energized, but dropping when the magnet ceases to attract.

14 represents a circuit switch-lever carrying an armature 23. When this lever 14 is moved into the position shown by dotted lines in Fig. 3, the circuit is closed by contact 24, and the lever is held in contact by the magnet 25 until the circuit is broken. The switch-motor 18 is connected by a rod 26 to the cam-plate 19, which is provided with a cam-slot 27, that engages a stud on one end of a switch-rod 28, which connects with the switch-rails S S', that are thus operated by the reciprocations of the cam-plate actuated by the motor apparatus. The signals are weighted so as be normally in a horizontal position indicating "danger." In order to move the signals to "safety," the switch-rails must first be closed, and although the switch-rails can be moved at pleasure the signals cannot be set to "safety" except when the tracks governed by the signals are clear for the passage of trains. This is because the signal-circuit is controlled by

a circuit-switch K, that is operated by a rod Q, connected with the switch-rails, as described in our hereinbefore-named patent.

Having described our invention, what we claim is—

1. The combination, with a railway-signal, of an electric motor provided with mechanism for operating the signal in one direction only, an electric generator in circuit with said motor, an automatic circuit-breaker for cutting out the motor after it has actuated the signal, and mechanism for cutting in a magnet-circuit for holding the signal, substantially as described.

2. The combination, with a railway-signal, of an electric motor and an electric generator connected in circuit, mechanism for actuating the signal from the motor, an automatic circuit-breaker for cutting the motor out of circuit after it has actuated the signal, and a magnet-circuit for holding the signal when

the motor is cut out of circuit, substantially as described.

3. The combination, with a railway-signal, of an electric generator and a signal-actuating motor connected in circuit, a circuit-breaker for automatically cutting out the motor after it has actuated the signal in one direction, the magnet-circuit for operating a detent to hold the signal after it has been moved by the motor, and the switch circuit-breaker 17 under the control of the operator for breaking the circuit and restoring the signal to its normal position, substantially as described.

In testimony whereof we have hereunto set our hands.

JOSEPH RAMSEY, JR.
FREDRIC C. WEIR.

Witnesses:

F. P. HORTON,
T. SIMMONS.