No. 638,607. Patented Dec. 5, 1899.

# H. B. TAYLOR.

## RAILWAY SIGNAL.

(Application filed Jan. 24, 1899.)

(No Model.)

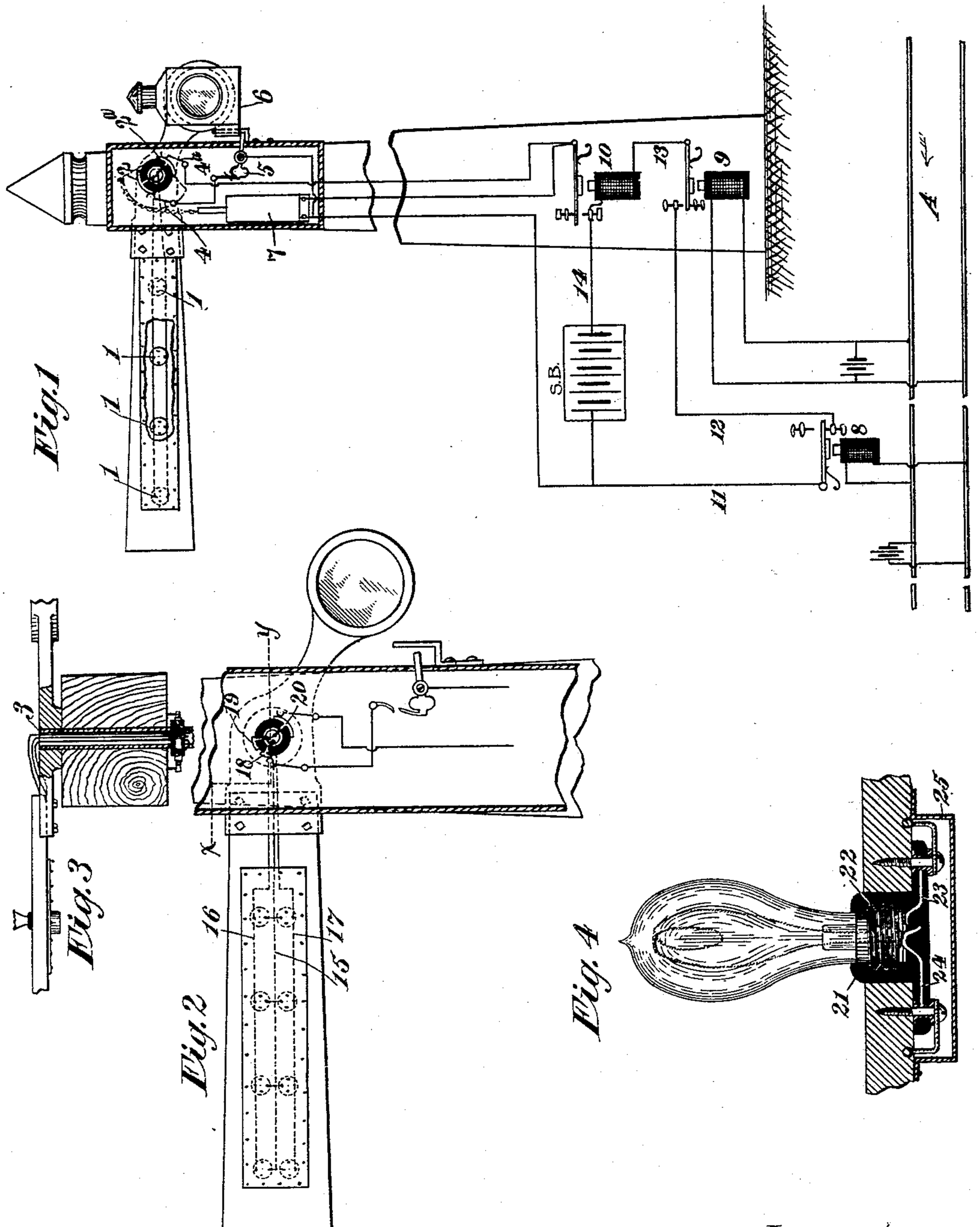


Fig. 1



Fig. 3



Fig. 2



Fig. 4

Witnesses:
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# UNITED STATES PATENT OFFICE.

HERBERT B. TAYLOR, OF NEWARK, NEW JERSEY, ASSIGNOR TO JAMES WAYLAND, OF SAME PLACE.

## RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 638,607, dated December 5, 1899.

Application filed January 24, 1899. Serial No. 703,238. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT B. TAYLOR, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

This invention relates to railway-signals.

The chief object of the invention is to provide an illuminated semaphore to indicate to an engineer the condition of the track.

In carrying out the invention I provide in or on the semaphore-blade a series of electric lamps, preferably incandescent lamps, and in order to save energy provide a mechanism by which these lamps shall be connected in an electric circuit with a source of energy only at the proper time to signal the engineer of an approaching train. I preferably employ as a source of electric energy a storage battery mounted upon or located adjacent to the signal-post, which battery may also serve as a source of motive power by which the semaphore is actuated.

The several features of novelty of the invention will be hereinafter more particularly described and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings, which illustrate the invention, Figure 1 is a side elevation, partly in section and partly diagrammatic, of a semaphore and its supporting-post arranged according to my invention and connected with a track-circuit for controlling its operation. Fig. 2 is a side elevation, partly in section, of a semaphore containing two series of illuminating devices by which different signals may be given. Fig. 3 is a cross-sectional view on a plane indicated by the line $x\ y$ of Fig. 2; and Fig. 4 is a cross-section of the semaphore-blade, showing the attachments for mounting one lamp.

Referring first to Fig. 1, which shows a semaphore with a single line or series of illuminating devices to indicate the condition of the block into which a train is about to enter, I mount upon the semaphore-blade a series of incandescent electric lamps 1 1 1, which are electrically connected by suitable leads with a commutator or circuit-breaker mounted on a sleeve which forms the axis of the semaphore, so as to turn with it. The commutator is provided with two metallic segments 2 $2^a$, mounted upon a ring or annulus of insulating material and electrically connected with the leads of the lamps 1 1 1, which pass through the hollow axis 3 of the semaphore. I preferably use as a source of energy for lighting the lamps a storage battery, (indicated at S B,) which when a train approaches furnishes a source of constant potential at the brushes or terminals 4 $4^a$. The segments of the commutator cover an arc of about sixty degrees or sufficient to cover the range of movement of the semaphore when dropping from a danger position to a safety position.

I preferably include between the storage battery and the brushes 4 $4^a$ a circuit-breaker 5, which is here shown as simply a weighted pivoted lever provided with a curled-spring contact to make a rubbing connection with a coöperating similar contact when the circuit-breaker is operated. I mount this circuit-breaker, as well as the other moving parts of the controlling mechanism of the semaphore, in a housing or closed space supported by the signal-post. The lever of the circuit-breaker 5 projects through a slot in the side of the housing in the path of the lamp when the latter is placed on its supporting-hook on the side of the post. Thus the operator in the pursuit of his regular duties insures the storage battery being disconnected from the lamps on the semaphore-blade during the day and the connection therewith for night use.

7 represents the solenoid or other motor controlling the movements of the semaphore. The controlling-circuits by which the movements of the semaphore are regulated may be of any desired arrangement. As I have shown them, however, in this case, I provide a rail-circuit at each side of the signal-post normally charged with potential and provide relays 8 9 in the rail-circuits, which are adapted to be short-circuited when a train enters a track-section corresponding to the relay, being thereby deënergized and operating the controlling-circuits of the semaphore. The circuit operating the semaphore is normally open at the armature of relay 10, which is controlled by the joint operation of relays

8 9, the controlling-circuit being normally completed through the armature of relay 8 and open at relay 9. Thus when a train approaches the signal and enters track-section A relay 9 is deënergized and the circuit through relay 10 completed from the storage battery by way of conductors 11, 12, 13, and 14. The armature of relay 10 thereby cuts in a parallel branch of the storage battery, energizing the motor 7 and operating the semaphore. Another parallel branch, including the commutator-brushes 4 4ª, is closed and the lamps 1 1 1 fed with current through the commutator-segments 2 2ª. As the semaphore tilts under the influence of the motor the connection with the storage battery is preferably preserved until a train passes out of section A by making the commutator-segments 2 2ª of sufficient width to prevent interruption of the circuit by the sweep of the semaphore. I may, however, cut out the lamps when the semaphore reaches its safety position, and in such a case will form the arcs 2 2ª of such a width as to accomplish this result. Where a change of color in the light is desirable, I mount on the semaphore-blade two rows of lamps differing in color—as, for instance, red and white—and in such case the commutator would be accordingly changed, so as to cut them in in order. Such an organization is shown in Fig. 2, the two series of lamps having one set of terminals connected with a common conductor 15 and the other sets of terminals with different conductors 16 17, which lead to different commutator-bars 18 19, conductor 15 being connected with a third commutator-bar 20.

The brushes which form the terminals of the storage-battery circuit bear one upon the commutator-segment 20 and the other in active relation when in danger position of the semaphore to the commutator-segment 18. Thus when the signal is operated the red lamps will flash a signal to an approaching engineer, while the segment drops to its safety position. When it reaches that position, they will be cut out and the white lamps thrown into a circuit, which latter may be automatically cut out on the entry of any part of the train into the track-section forward of the signal-post or may be arranged to simply flash the signal while the semaphore is dropping to its safety position. By reason of the joint operation of relays 8 and 9, corresponding to the two track-sections, if a train be in the forward section the engineer on entering section A cannot get a clear signal.

In Fig. 4 is shown a convenient form for mounting the lamps in the semaphore-blade. A soft-rubber socket 21 is mounted in the blade, in which is anchored by molding a spun threaded metallic socket 22, permitting the lamp-base to be screwed thereinto. This socket connects with one of the lamp-leads on the semaphore-blade, as indicated at 23, the other lead terminating in a contact 24, anchored in the rubber in position to engage the other terminal of the filament. The leads and screws which fasten the rubber socket to the semaphore-blade are protected from the weather by a sheath of aluminium or other waterproof material, as indicated at 25. This construction prevents damage to the lamps by shock and makes the posts waterproof. The storage batteries and relays (indicated diagrammatically in Fig. 1) are in practice housed in a closed casing supported on the signal-post.

In systems in which home and distant signals are used the two semaphores may carry lamps of different colors.

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

1. A railway-signal comprising a semaphore having one or more electric lamps mounted on its blade, a circuit-closer for said lamps in a supply-circuit operated by the movement of the semaphore, and an auxiliary circuit-closer in said supply-circuit controlled by a relay in a track-circuit, said auxiliary circuit-closer depending for its operation on the position of a train on the track.

2. A railway-signal comprising a semaphore having one or more electric lamps mounted on its blade, electrically-operated devices for shifting the semaphore, a circuit-closer in the lamp-circuit operated by the movement of the semaphore, a source of current common to the semaphore-operating motor and the lamp-circuit, and a relay in a track-circuit controlling an auxiliary circuit-closer common to both the lamp and semaphore operating circuit.

3. A railway-signal comprising a semaphore carrying one or more incandescent electric lamps, a source of electric energy adapted to be connected with said lamps, and a circuit-breaker controlled by a signal-lantern mounted on the post and adapted to cut off the battery connection when removed therefrom.

4. A railway-signal comprising a semaphore having mounted in its blade a lamp-socket formed of soft rubber to receive and cushion an incandescent lamp, a flange on said socket overlapping the rear side of the blade, contacts for the lamp-terminals and a metallic screw-cap for the lamp molded into the socket, metallic bushings in the flange connecting with the terminals, and fastening devices passing through said bushings and securing the socket to the screw and uniting the circuit-leads to the socket-contacts.

In testimony whereof I have hereunto subscribed my name this 6th day of January, A. D. 1899.

HERBERT B. TAYLOR.

Witnesses:
ROBT. H. READ,
ALICK G. MACANDREW.