

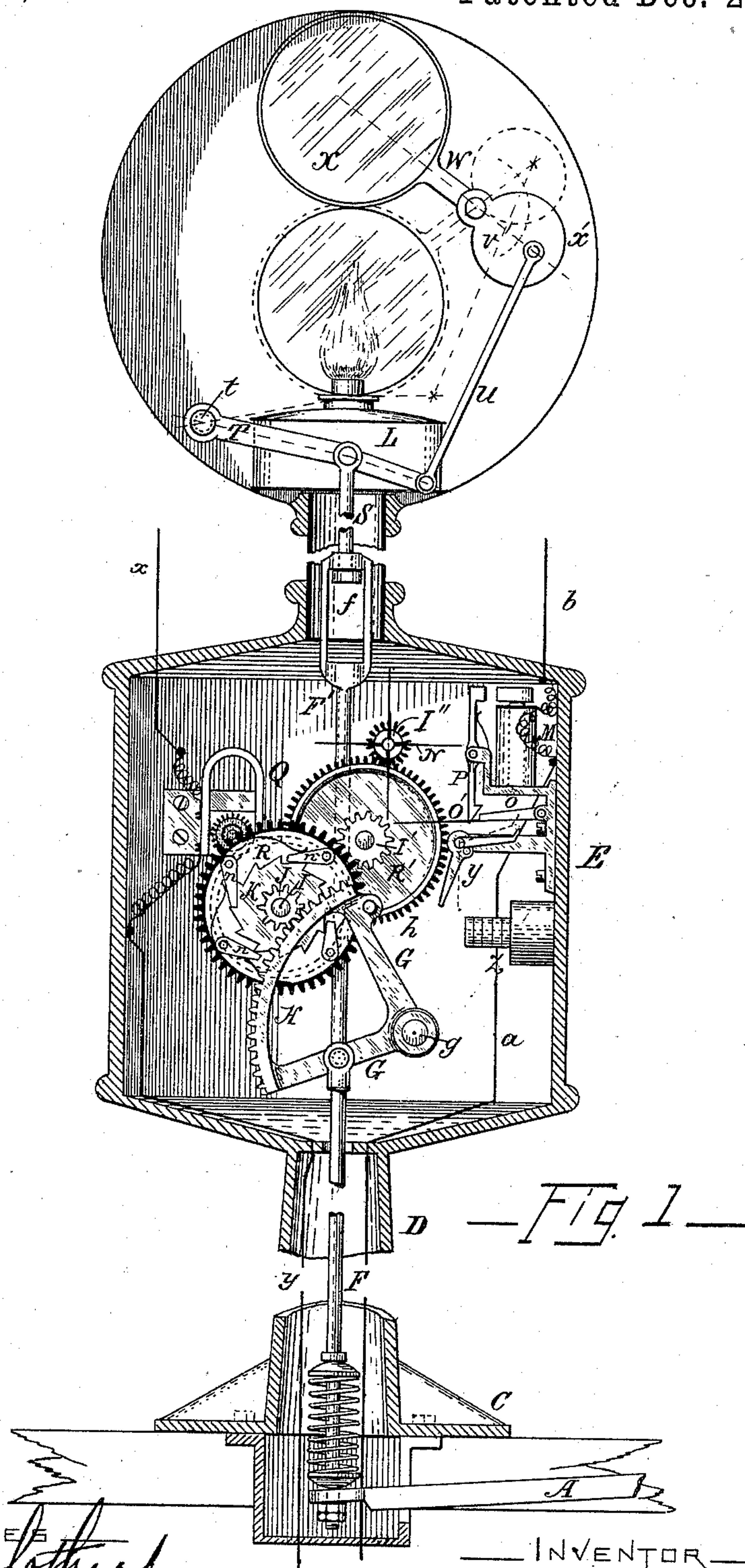
(No Model.)

2 Sheets—Sheet 1.

G. H. LOTHROP.
RAILWAY SIGNAL.

No. 488,441.

Patented Dec. 20, 1892.



WITNESSES
George H. Lothrop
John H. Anderson

— INVENTOR —
George H. Lothrop

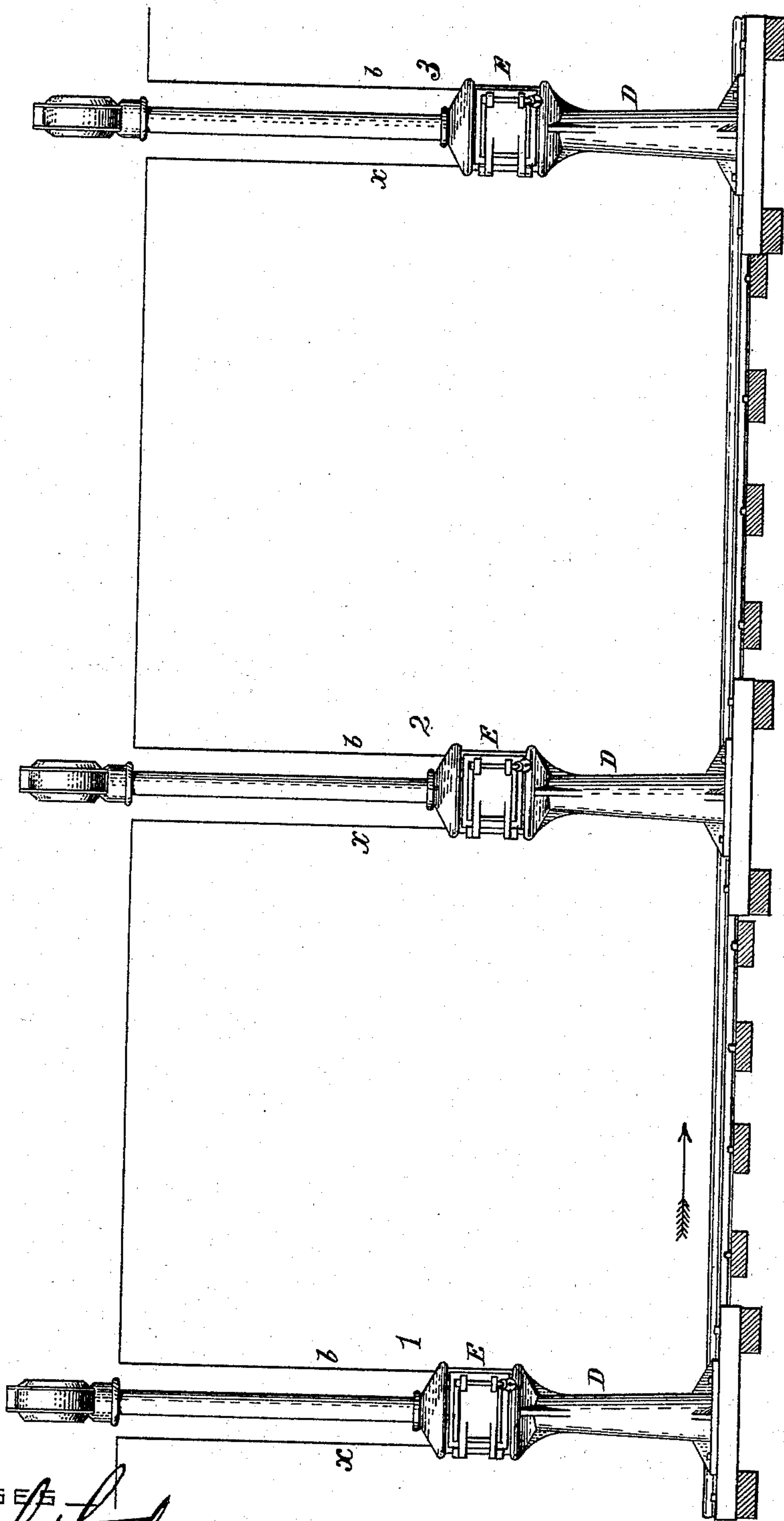
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— FIG 2 —

— WITNESSES —
George H. Lothrop
Gertrude H. Anderson

— INVENTOR —
George H. Lothrop

UNITED STATES PATENT OFFICE.

GEORGE H. LOTHROP, OF DETROIT, MICHIGAN.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 488,441, dated December 20, 1892.

Application filed March 28, 1892. Serial No. 426,815. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. LOTHROP, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful
5 Improvement in Railway-Signals, of which the following is a specification.

My invention consists in an improvement in railway signals, hereinafter fully described and claimed.

10 Figure 1 is a side elevation with the casing in section. Fig. 2 is an elevation of three signals in position.

My invention consists of a railway signal, in which the passage of the train releases the
15 signal, stores up power, and at the same time locks the power stored up, and when passing the next signal, not only repeats the above action, but generates an electrical current which travels back and unlocks the
20 power previously stored up in the signal last passed, the object being first, to dispense with the necessity of an attendant at each signal, and second, to avoid doing heavy mechanical work by the use of an electrical current, as is
25 usual in signals as now constructed.

A represents a track lever adapted to be actuated by a passing train and which may be of any known construction, though I prefer that class of lever which is actuated by
30 the depression of either a movable rail in the track, or the depression of the rail as a part of the track.

F represents a connecting rod which passes through a hole in the end of lever A, and is
35 provided with nuts on the under side of said lever, and on the upperside of said lever is encircled by a spiral spring, whose upper end abuts against a collar secured to rod F, while its lower end presses a loose collar
40 against lever A, the object of this construction being to relieve the shock of the upward movement of lever A.

C represents a box or base of the signal, from which rises a hollow post D, through
45 which connecting rod F plays, and E represents a box carried on post D, in which is contained the locking and electric mechanism.

M represents the magnet of an ordinary telephone shutter, having the pivoted hook
50 P and a pivoted shutter O adapted to be held in position by hook P when raised.

O' represents a light arm, which may be a

spring arm secured to shutter O, and being so arranged that when the shutter O is thrown up in position to be locked by hook P, the
55 arm O' comes in the path of the fan N, as hereinafter described.

Q represents an ordinary small dynamo or magneto electric machine, which may be substantially the same thing used in telephone
60 calls, secured in box E, and having its armature adapted to be rotated whenever lever A is forced upward. The armature of this dynamo or magneto may be connected with any
65 of the parts of the signal mechanism which move under the impulse of the train; that which I have illustrated is as follows:

G and H represent a segmental gear pivoted at g and connected to the connecting rod F so as to move positively with said rod in both
70 directions. The segmental gear H meshes with the pinion J secured on shaft I.

K represents a ratchet wheel rigidly secured either to pinion J or shaft I, and R represents a gear wheel loose on shaft I and carrying a
75 series of pawls n to engage with ratchet wheel K, whereby when said ratchet wheel is turned in one direction it does not affect gear wheel R, but cannot turn in the other direction without affecting said gear wheel. Gear R meshes
80 with a pinion I' secured to another gear R', which in turn meshes with another pinion I'' carrying a fan N, like the governor of a music box, forming a train of wheel work the object of which is to permit a light and easily
85 movable detent to lock the train, and hold connecting rod F in a raised position. A gear wheel shown in dotted lines, Fig. 1 is secured on shaft I behind gear wheel R, and meshes with a pinion on the armature of the dynamo
90 or magneto Q so as to rotate said armature when shaft I is rotated. The connecting rod F is continued upward as shown at F', to reach the signal mechanism, and at its upper end is bifurcated as shown at f, the object being to
95 make a sliding connection with the rod S which operates the signal.

L represents a lamp set in a box supported on a post which rises from box E.

T represents a lever pivoted at t in said box, 100 to which lever the rod S is pivoted.

X represents a disk of red glass carried on one end of a lever W pivoted in a lamp box, and V represents a counter-weight on said le-

ver W, said counter weight \bar{V} being connected by pitman U with lever T, the weight of the disk X being sufficient to a little more than counterbalance counter weight V, pitman U, lever T and rod S, so that the tendency of disk X is to fall into the position shown in dotted lines, in which it covers the aperture in the signal box, but is held in the position shown in the drawings in full lines by the weight of connecting rod F' and its connections.

x and y represent connections from the terminals of the dynamo or magneto Q to the next signal and to the ground, and b and a represent conductors connecting the terminals of the bobbin of magnet M respectively with the next signal and with the ground. The arm O' carried by shutter O is adapted to be lifted into the path of the fan N to check the revolution of said fan.

Y represents a bell-crank lever pivoted in box E, one arm lying in the path of stud h on gear G, and the other arm adapted when raised to force shutter O upward into engagement with hook P. When the stud h moves the bell crank lever Y so as to raise shutter O, it passes the end of the vertical arm, and on its return simply swings said bell crank lever without affecting any of the other parts of the mechanism.

The operation of this device is as follows: When the lever A in signal 1, Fig. 2, is actuated by a passing train, the connecting rod F is forced upward and through the segmental gear G, H and pinion J, rotates shaft I, thus rotating the armature of the dynamo or magneto Q. Stud h swings bell-crank-lever Y, thus forcing shutter O into engagement with pivoted hook P, throwing arm O' into the path of fan l , and thus holding the fan N against revolution, thus locking the entire train of wheel work and holding connecting rod F in an elevated position. Z represents a bumper which may be used to check the motion of lever H. I prefer to allow lever A and connecting rod F to be thrown up by the impulse of a fast train, so that the short arm of lever A which comes in contact with the wheel or rail will be thrown down below a point where the wheel or rail can strike it, and it will not be affected by the succeeding wheels of a train, and for this purpose I preferably allow connecting rod F a greater range of motion than is necessary merely to operate the signal. When connecting rod F is forced upward, the rod S slides freely through the bifurcated end f of said connecting rod, and the disk X falls by its own weight into the position shown by the dotted lines, thus covering the lamp opening, and converting the signal into a danger signal. When the train

passes the next signal No. 2, Fig. 2, and operates the dynamo or magneto Q therein, a current comes back to signal No. 1, Fig. 2, through conductor b , energizes magnet M, swings the pivoted hook P and liberates shutter O, which falls by its own weight, releasing the fan N. This permits the train of wheel work to revolve under the weight of the connecting rod F and its connections, and said connecting rod settles back to its normal position, in doing which it raises disk X to the position shown in full lines in the drawings, thus showing a white light instead of a red light. A counterweighted semaphore may be used.

I am aware of Patent No. 447,989 to James Wayland, and do not claim the construction shown therein.

What I claim as my invention and desire to secure by Letters Patent, is:—

1. In a railway signal system, the combination with a track lever adapted to be actuated by a passing train, of a signal normally tending to go to danger, a connection between said track lever and said signal whereby said lever when actuated by a train releases said signal and permits it to go to the danger position, and on its return draws said signal to the safety position, a detent adapted to lock said signal actuating mechanism at danger position, an electro-magnet adapted when energized to withdraw said detent and release said signal actuating mechanism, a second track lever placed at a distance in advance of said signal, a dynamo or magneto electric generator connected with said second track lever, and an electric circuit including said electro-magnet and said dynamo or magneto, whereby the passage of a train over the first track lever permits said signal to go to danger and lock in that position, and the passage of said train over the second track lever electrically releases said lock, substantially as and for the purposes set forth.

2. A railway signal consisting of a track lever, a signal constantly tending to move to the "danger" position, a sliding connection from the track lever to the signal, a detent positively operated by the track lever to hold up the track lever when raised, an electro-magnet controlling said detent, a second track lever at a distance, a dynamo or magneto connected with said second track lever, and a connection from said dynamo to the detent-controlling-magnet, substantially as and for the purposes set forth.

GEORGE H. LOTHROP.

Witnesses:

CYRUS E. LOTHROP,
GERTRUDE H. ANDERSON.