(No Model.) 2 Sheets—Sheet 1.

W. DAVES & W. H. PEDDLE.

AUTOMATIC RAILROAD SIGNAL.

No. 496,473. Patented May 2, 1893.

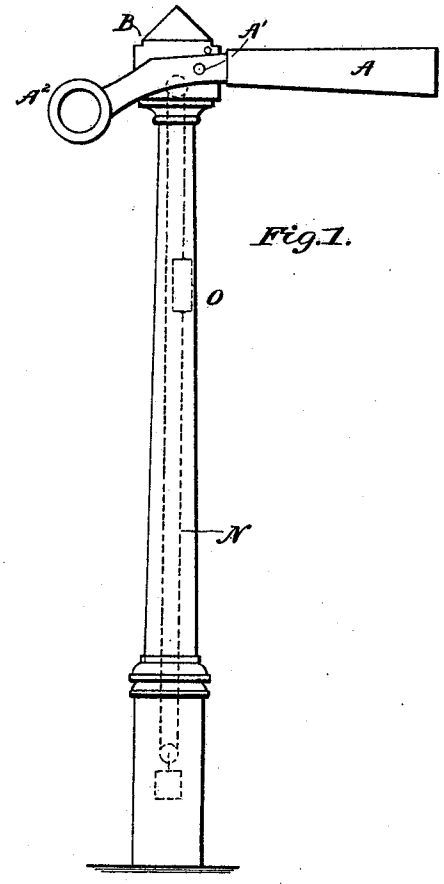

Fig. 1.

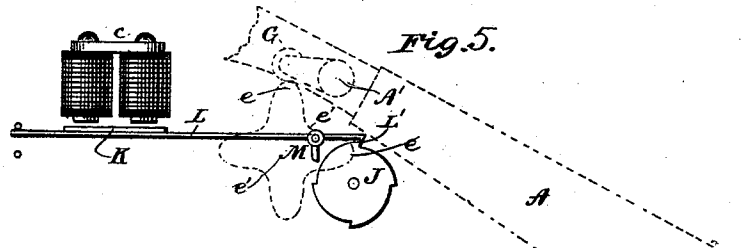

Fig. 5.

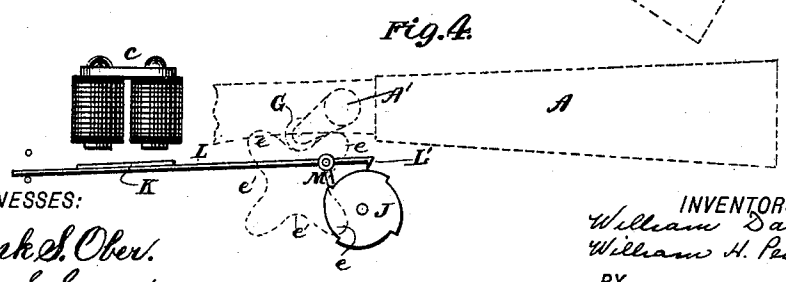

Fig. 4.

WITNESSES:

Frank S. Ober.

Henry E. Erding.

INVENTORS

William Daves,

William H. Peddle.

BY

R. C. Mitchell

their ATTORNEY.

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Fig. 2.

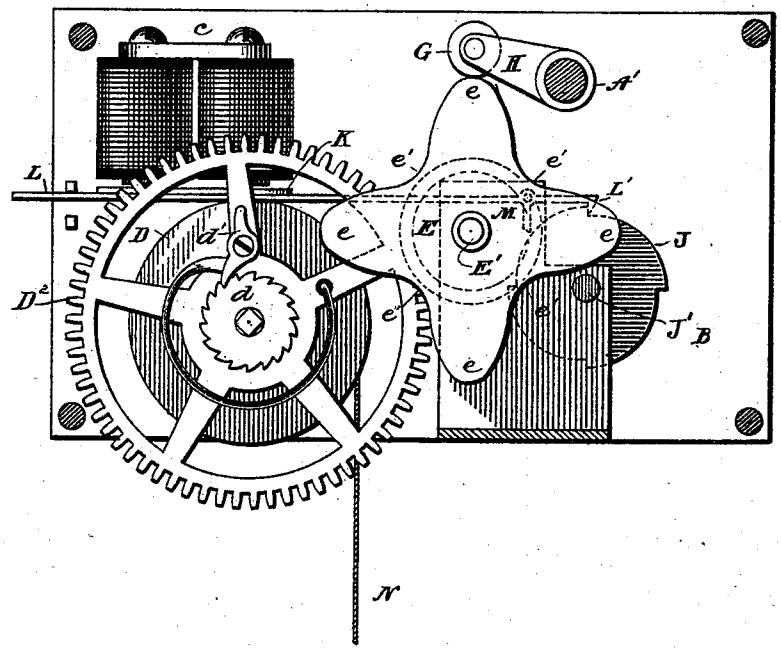
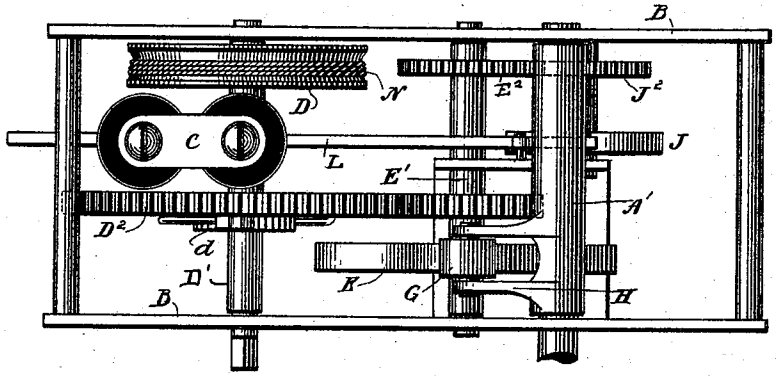


Fig. 3.



WITNESSES:

Frank S. Ober.

Henry E. Everding.

INVENTORS:

William Daves,

William H. Peddle

BY

R. Crutchett.

their ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM DAVES, OF JERSEY CITY, AND WILLIAM H. PEDDLE, OF ROSELLE, NEW JERSEY.

AUTOMATIC RAILROAD-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 496,473, dated May 2, 1893.

Application filed September 2, 1892. Serial No. 444,928. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM DAVES, residing at Jersey City, in the county of Hudson, and WILLIAM H. PEDDLE, residing at Roselle, Union county, New Jersey, have invented certain new and useful Improvements in Automatic Railroad Signals or Semaphores, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same.

Our invention relates to improvements in automatic railroad signals or semaphores and consists in the combination and arrangement of parts hereinafter more fully described and claimed, whereby the semaphore arm, which is normally at danger may be automatically raised or lowered according to the position of a train upon the track, that is to say, while the train is in the section to be protected, a magnet controlling the signal is demagnetized and the semaphore arm moves to its elevated or "danger" position, and after the train leaves the section, the magnet is energized and the semaphore is moved to the "no danger" position.

Our invention is illustrated in the drawings in which:—

Figure 1 is a front elevation of a semaphore; Fig. 2, a side view of the mechanism actuating and locking the semaphore with the front plate cut away; Fig. 3, a top view of the same and of the inclosing frame; Fig. 4, a diagrammatic view of certain parts of the mechanism operating the semaphore, showing the position of said parts when the semaphore is elevated, and Fig. 5 is a similar view showing the positions of said parts when the semaphore is lowered, or depressed.

A is a semaphore working on the shaft A′ which rotates in suitable bearings in the box or frame B of the support for said semaphore and suitably weighted at one end A^2. The shaft A′ is furnished with a depending arm or crank H (carrying by preference a friction wheel or roller G) through which motion is conveyed to the semaphore shaft A′ by means of the rotation of a cam-wheel E. This cam-wheel E has on its periphery alternate elevations and depressions *e e′*, which, as shown in the drawings, are by preference four each, although it can be readily understood that any number of these alternate depressions and elevations can be used without departing from our invention. This cam E is keyed to a shaft E′ which is geared to the shaft D′ of a drum D, and also to the shaft J′ of a detent J. The detent J has its periphery notched substantially as shown in the drawings, its motion being controlled by a lever L, one arm of which serves as an armature for, or is attached to an armature K, of the magnet C. The other arm of lever L is furnished at its end with a hook or claw L′, and at or near its fulcrum with a depending arm M, all arranged so that the claw L′ and arm M will, when the lever L is operated, alternately bear upon and engage the notches in the periphery of the detent J much in the manner of a clock or watch escapement. The drum D, through which motive power is furnished to the train, consisting of the gear-wheel D^2 the cam-wheel E and detent J, receives its motion from a cord or chain N and weight O, or by a spring, as preferred. The drum D is keyed to its shaft D′ which also carries the loose gear wheel D^2 mounted on the shaft D′ and controlled by the pawl *d* and ratchet *d′*. The magnet C is constantly energized, until the circuit is broken by the passage of a train over the section designed to be protected by the signal, in any well-known way. Motion is conveyed from the drum D through its shaft D′ and gear-wheel D^2 to the cam shaft E′ and from thence to the detent shaft J′ and detent J. The rotation of the detent J is controlled by lever L, actuated by the magnet C.

The operation is as follows:—When there is no train upon the track section designed to be protected, the semaphore is at the position shown at Fig. 5 or "no danger" position. In this position, the magnet C being energized the armature end of the lever L is raised, and the claw L′ of lever L impinges upon and engages a step of the detent J. The cam wheel E assumes a position, indicated by dotted lines in Fig. 5, wherein the crank or arm H rests upon one of the elevations of the surface of cam wheel E, and the "danger" arm of the semaphore is tilted downward. When the train enters the section designed to be protected by the signal, the magnet C is demagnetized, thereby allowing the arma-

ture arm of lever L to drop. The arm M is then thrown into engagement with the periphery of the detent J while the claw L′ is at the same time thrown out of engagement with the steps in said periphery. The train operating the shaft E′ of the cam-wheel E is then allowed to move a distance corresponding to the distance traveled by the periphery of the detent J before the next step in the periphery after the one occupied by the claw L′ of the lever L is occupied by the arm M. By calculation this distance is so adjusted that the cam-wheel E is rotated sufficiently to allow the crank H and roller G of the semaphore shaft A′ to rest in one of the depressions *e′* of the periphery of the cam-wheel, when the "danger" arm of the semaphore A will be elevated as indicated in Fig. 4, by the action of gravity upon the weighted end A^2 of the semaphore. In this position the arm of the semaphore A is locked by the engagement of the arm M with one of the steps of the detent wheel, until the train passes out of the section when the circuit is again completed and the magnet C energized. The lever L now assumes the initial position and the arm M is drawn out of engagement with the step in the periphery of the detent J. The detent J then rotates until the claw L′ of lever L engages in the step previously occupied by arm M. The cam E travels sufficiently to carry the crank H of semaphore shaft A′ to its highest elevation *e* and the danger arm is tilted into the position shown at Fig. 5, indicating safety, and so on.

Having described our invention, what we claim is—

1. The combination of a semaphore A and its shaft A′, with the cam E, and mechanism substantially as described to automatically rotate said cam E to thereby alternately raise and depress said semaphore A, with the detent J and the claw-shaped escapement lever L adapted to alternately engage the detent J with one claw and then the other successively, by means of the electro-magnet C, substantially as and for the purposes set forth.

2. The combination of the magnet C, the armature K, the escapement lever L, having the claws L′, M arranged to intermittently engage the detent J, with the drum D, cam E and semaphore shaft A′, said drum D, cam E and detent J, being geared together and said cam E being adapted to operate said semaphore shaft A′, substantially as described.

3. The combination in an automatic signal of the weight O, connection N, drum D, toothed wheel D^2 meshing with a pinion on the arbor E′ carrying the cam piece E with the toothed wheel E^2 meshing with the wheel J^2 on the arbor carrying the detent J, and with the claw shaped escapement lever L, adapted as described to intermittently permit the cam E to be revolved a certain distance, when the electro-magnet C is energized, and again revolved a substantially equal distance when the circuit is broken, to raise and lower the semaphore arm A, substantially as described.

4. The combination in a signal of the cam E with the pulley G, at or near the extremity of the crank H, on the semaphore arbor A′, said pulley being adapted to bear against the periphery of the cam E, and thereby cause the semaphore A to be raised or lowered, substantially as described.

WILLIAM DAVES.
WILLIAM H. PEDDLE.

Witnesses:
RICHARD H. MITCHELL,
HENRY E. EVERDING.