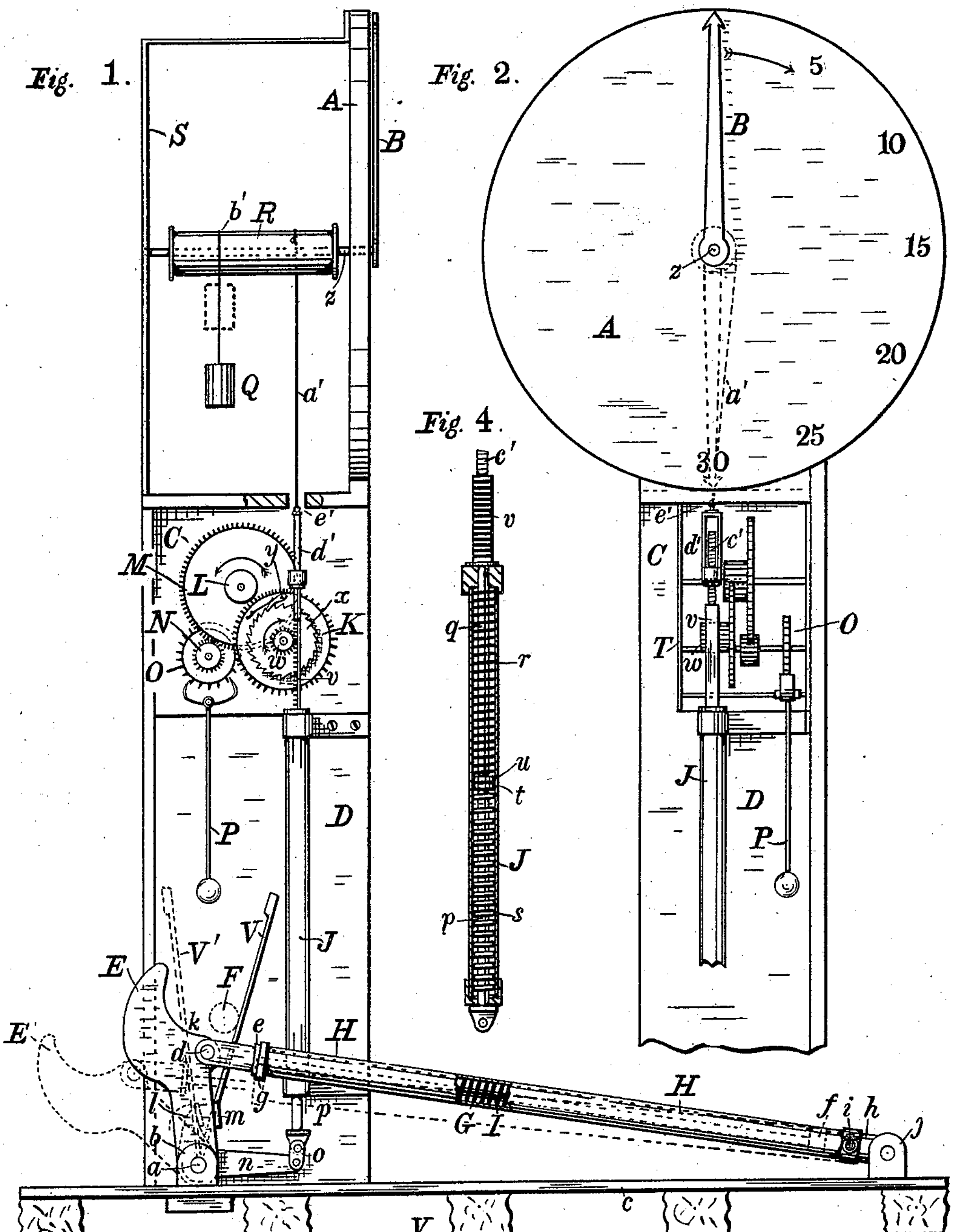
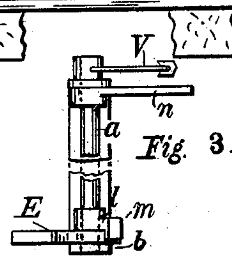
(No Model.)

A. C. GORDON.

RAILWAY TIME SIGNAL.

No. 493,083. Patented Mar. 7, 1893.





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UNITED STATES PATENT OFFICE.

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RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 493,083, dated March 7, 1893.

Application filed September 1, 1892. Serial No. 444,804. (No model.)

To all whom it may concern:

Be it known that I, ANGUS C. GORDON, a citizen of the United States, residing at Rochester, in the county of Monroe, in the State of New York, have invented an Improved Railway-Signal, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved railway signal, designed to display a visible signal for a limited period of time to indicate the number of minutes which have elapsed since the passage of the last train.

My improved railway signal is fully described and illustrated in the following specification and the accompanying drawings,—the novel features thereof being specified in the claims annexed to the said specification.

In the accompanying drawings representing my improved railway signal;—Figure 1 is a side elevation, showing the mechanism for operating the signal from a passing engine or train. Fig. 2 is a partial side-elevation, taken at right angles to Fig. 1. Fig. 3 is a plan view of the operating mechanism. Fig. 4 is a section showing the springs.

My improved railway signal consists essentially of an upright or standard arranged at a suitable distance from the track, and supporting a dial and pointer, and a clock-work arranged to be set in operation by a passing train, so that up to a certain period of time, preferably half-an-hour, after the passage of such train, the engineer of the next succeeding train is notified how many minutes have elapsed since the last preceding train passed. The clock-work actuates the pointer for half-an-hour after the passage of the train,—and the next train restores the pointer to its original position and again starts the clock-work into operation. The clock-work is arranged or constructed so as to run for only a definite period of time.

A represents the dial, B the pointer, C the clock-work, D the standard, and E the operating lever, which is arranged at a suitable distance from the rails in such position as to be moved by the arm or roller F on the engine or train. The dial is arranged to face the engineer on an approaching train. The pointer B, when the clock-work has been started, begins to move in the direction indicated by the arrow in Fig. 2, and continues such movement for thirty minutes,—the dial being provided with a suitable corresponding graduation. At the end of this period, the clock ceases to drive the pointer, and the engineer of the next train is informed that the preceding train is at least one-half an hour in advance. If the pointer occupies any intermediate position, the engineer will know from such indication, how many minutes have elapsed since the preceding train passed the signal.

It will be understood that the signals will be placed at suitable distances apart along the line of the road,—say one or two miles and preferably on both sides of the track. The clock-work is arranged so that the pendulum or vibrating part is set in motion at the same time that the pointer is restored to position and the spring which operates the clock-work is set by a passing train. This is effected as will hereinafter be described by the superior force of spring *s* which is normally overcome by the spring G and so as to be held away from spring *r*.

The lever E is pivoted on the rod *a* arranged to turn in any suitable supports, such as indicated at *b* in the drawings. The rod *a* extends outward from the track to the point where the standard is erected. The signal may be supported by a bar or plank *c* attached to the ties,—the lower end of the standard being inserted in the ground.

The lever E is swung by the contact of the lug or roller F from the position indicated by the full lines in Fig. 1, to that represented by the dotted lines E′,—this movement compressing the spring G in the tube H, which, immediately after the lug F has passed restores the lever to its original position. A rod I passes through the spring in the tube, being pivoted to the lever E at one end, as indicated at *d*, Fig. 1, and at the other end provided with a piston or follower, *f*, which bears against the spring G. The tube H is provided with a head *g*, through which the rod I slides. The rod I is provided with a stop or collar *e*, which limits the movement of the spring and the lever. At the other end the tube has a head *h* which is pivoted in a suitable bracket *j* attached to the bar *c* or other suitable support. In order to control the return movement of the lever, an air-inlet valve may be attached to the tube, as indicated at *i*, Fig. 1. This valve opens inward and permits the free entrance of the air behind the piston *f*, but retards its escape, so that it returns at a graduated speed.

The upper end of the lever E is preferably given a curved form,—the lower part of the curve being inclined upward, as shown at *k*, so that it may be started in motion gradually and without shock by the contact of the lug F. The construction is such that the lug aided by spring *s* has only to overcome the inertia of the lever and the resistance of the spring G, since the lever turns freely on the rod *a*.

The rod or rock-shaft *a* is provided with an arm *l*, which has a lug *m* which projects over the edge of the lever E. At the end away from the track, the rock-shaft *a* is provided with an arm *n*, which is connected by a suitable link *o* or other device with a rod *p* which slides inside the tube J supported in any suitable way from the standard. The tube J contains two springs, *r* and *s*, Fig. 4, of different tensions,—the lower one *s* being the stronger of the two. The rod *p* runs through a head on the lower end of the tube J, extends through the spring *s*, and is provided with a head *t*, Fig. 4, which bears on the upper end of the spring. When the lever E moves from E to E′, the spring *s* expands, compressing the spring *r*, and turning the rock-shaft *a* so that the lug *m* is held in contact with the edge of the lever until said spring has expanded and lifted rods *p* and *q* with the effect to compress spring *r*. Said spring *s* therefore through the medium of arm *n*, rock shaft *a*, and rock shaft *t* and lug *m* normally acts upon lever E in opposition to spring I′ and diminishes the force required to operate said lever by the train. The return movement of the lever E, under the influence of the spring G, draws the rod *p* downward, and compresses the spring *s*,—thus allowing the spring *r* to expand, and this movement of the spring *r* operates the clock-work and is regulated by the escapement, as hereinafter described. The rod *q* passes through the spring *r*,—being provided at the lower end with the head *u*, Fig. 4. At its upper end, the rod *q* is provided with a rack *v*, which engages with a pinion *w*, which is connected to the ratchet wheel *x*, so that the pinion and ratchet revolve together. A spring pawl *y*, Fig. 1, on the gear K of the clock-work, engages with the teeth of the ratchet wheel *x*. As the rod *q* and rack *v* rise upward, the ratchet-wheel turns from right to left, in Fig. 1, the pawl *y* passing freely over the teeth,—no movement being imparted to the clock work. When however the rack *v* is lowered by the action of spring *r* the pawl engaging the teeth of the ratchet wheel drives the gear K, and this movement is transmitted, through a suitable train of gears, such as L, M, N, to the escapement wheel O, the movements of which are controlled by the oscillations of the pendulum P, or other suitable vibrating part. The rod *q* is connected with the shaft *z* of the pointer, by the chain, cord, or other suitable device, *a′*, so that the descent of the rod and rack, which is regulated by the clock-work, turns the pointer from left to right, as indicated by the arrow in Fig. 2. When the rod *q* is raised upward the return movement of the pointer is secured, by the weight Q, attached to the cord *b′*, which runs over the spool R, on the shaft *z*, which carries the pointer B. The shaft *z* is supported by a suitable frame-work S, to the front of which the dial is attached. The pointer may be protected by a glass plate. The shafts of the clock-work are supported by a suitable frame T, Fig. 2,—one side of which is omitted in Fig. 1.

The clock-work is of any ordinary or preferred construction, adapted to run for the length of time which the pointer is intended to indicate. The escapement may be of any ordinary type, and the oscillating or vibrating member of it, is arranged to be set in motion by an arm or lever V, Figs. 1 and 3 on the rock-shaft *a*. When the rock-shaft is turned by the spring *s*, the arm V swings to V′, Fig. 1, and moves the pendulum P to the left-hand, so that as soon as the arm returns to its original position, the pendulum begins its swing. Suitable guides may be provided, to prevent too great lateral movement of the pendulum, and to confine the arm V to the proper path. The arm V is itself a spring, or it may be provided with a spring at its upper end, to prevent its striking the pendulum too hard. Said arm is moved by the rocking of shaft *a* to which it is fixed the shaft being moved initially in one direction by the combined action of spring *s* and of a train. The shaft is rocked back and arm V removed from the pendulum to permit it to swing by spring G which comes into action as soon as the lug F passes off from lever E.

The rack *v* terminates in a threaded rod *c′*, on which the turn-buckle *d′* is fitted, so that, the flexible connection *a′* being attached to a swivel eye *e′* at the upper end of the turn-buckle, the length of the connection may be adjusted to bring the pointer accurately to the proper position. The turn-buckle may be secured in place on the rod by a jam-nut

It will be observed that the passage of a train will restore the pointer to the upright position, whether it has moved the whole of the half-revolution, or only a portion of the same.

It will be obvious to the skilled constructor that many changes or modifications may be made in the construction of my improved railway-signal, without departure from the essential features thereof. Thus the pointer may be made to travel in a straight line, a spring may be substituted for the weight Q, a weight may be employed to actuate the clock movement instead of the spring *r*, the clock-movement may be of a different construction from that shown, and located in any suitable relation with the pointer, the ratchet mechanism may be variously modified, different kinds of springs may be employed, and any suitable mechanism for operating the clock from a passing engine or train may be adopted. It will also be understood that the lever E and attachments may be used in connection with movable railway-signals other than that herein described. It will also be understood that an ordinary clock-movement operated by a spring can be attached to furnish the greater part of the motive power requisite to operate the pointer.

I claim—

1. In a railway signal, a clock movement, a spring to operate it, a spring adapted to be compressed by a passing train and an intermediate spring stronger than the first named and adapted to act against it and to act with that compressed by the train whereby said intermediate spring cooperates with the train and compresses the clock spring, substantially as set forth.

2. In a railway signal, a movable device such as lever E in the path of the train and a spring such as *s* normally acting to aid the train in moving said device, substantially as set forth.

3. In a railway signal, a clock having a motor to run it a definite period, a clock starting device independent of the clock adapted to be operated by the passing of a train at any moment between the beginning and end of said period, consisting of a rock shaft having an arm V and an arm E the latter being arranged in the path of a moving train, substantially as set forth.

4. The combination, in a railway signal, of the movable pointer B, the clock-movement C, arranged to regulate the pointer and actuated by a spring, a second stronger as *s* spring acting in opposition to the first, and mechanism operated by a passing train whereby the second spring is released to compress the first to actuate the clock-movement during its expansion, said second spring normally cooperating with the train to diminish the shock of its impact substantially as described.

5. The combination, in a railway-signal, of the movable pointer B, the clock-movement C arranged to move the pointer and operated by the spring *r*, the stronger spring *s*, acting in opposition to the spring *r*, and a movable arm E arranged to be moved by a projection on a passing train, and provided with a spring G acting in opposition to the spring *s*, substantially as described.

6. The combination, in a railway-signal, of the movable pointer B, the clock-movement C, the spring *r* for actuating the clock-movement, rack *v*, pinion *w*, and ratchet *x y*, and mechanism arranged to be operated by a passing train and adapted to compress the spring, said spring being connected and adapted to actuate the clock movement substantially as set forth.

7. The combination, in a railway-signal, of a movable pointer regulated by a spring actuated clock-movement, the arm E, arranged to be moved by a projection on a passing train and provided with spring G, the rock-shaft *a*, having arms *l* and *n*, and the spring *s*, arranged to act in opposition to the spring which actuates the clock movement, substantially as described.

8. The combination, with a movable railway signal, of the pivoted lever E, having inclined surface *k*, and the spring G, substantially as described.

9. The combination, with a movable railway signal, of the pivoted lever E, having inclined surface *k*, the spring G and tube H, substantially as described.

10. The combination, with a movable railway-signal, of the pivoted lever E, having inclined surface *k*, the spring G, tube H, rod I having follower *f*, and air-valve *i*, substantially as described.

11. The combination, in a railway-signal, of a movable pointer, a clock-movement operated by a spring arranged to be compressed by a passing train, the lever E, spring G, rock-shaft *a*, and arm V, arranged to start the clock-movement, substantially as described.

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Witnesses:
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