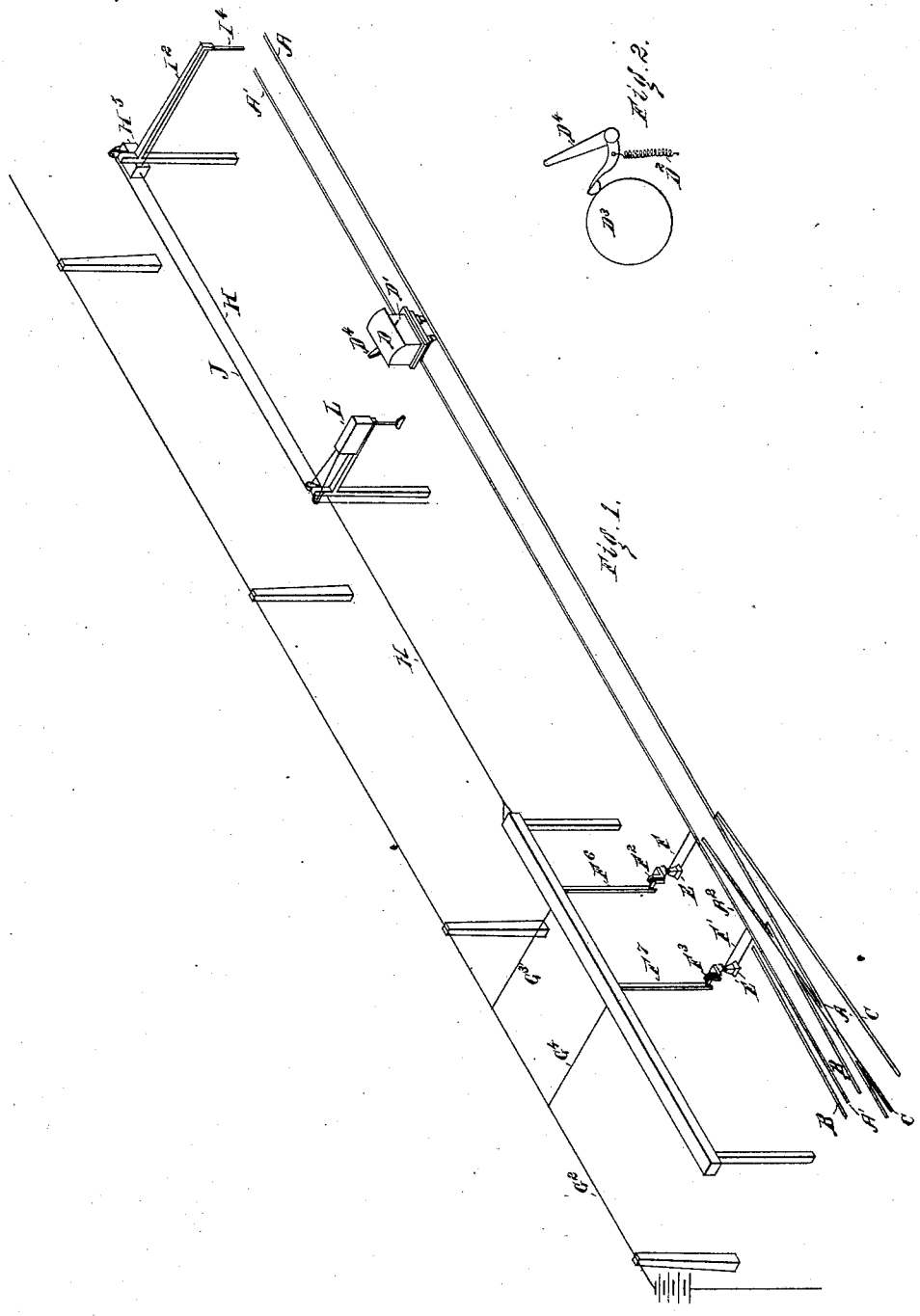
(No Model.) 3 Sheets—Sheet 1.

A. PEVEY.

RAILWAY SWITCH ALARM.

No. 333,665. Patented Jan. 5, 1886.



Witnesses—
Gertrude M. Day.
Hinkley Hyde.

Inventor—
Abiel Pevey
By Albert M. Moore,
His Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

A. PEVEY.

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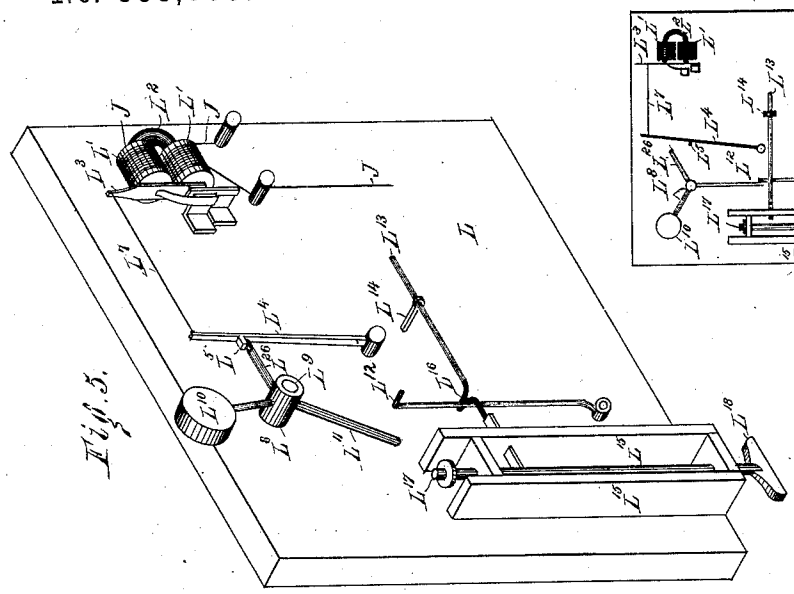


Fig. 5.

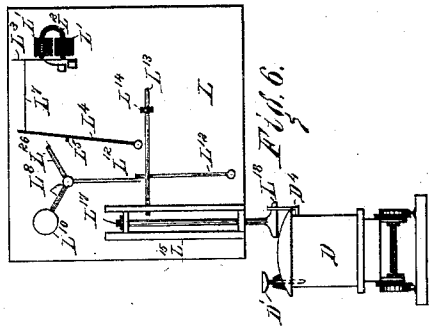


Fig. 6.

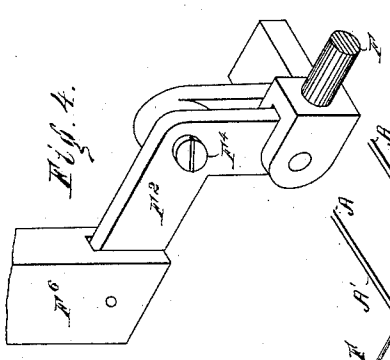


Fig. 4.

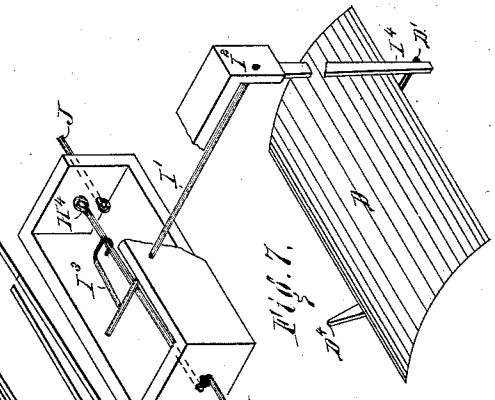


Fig. 7.

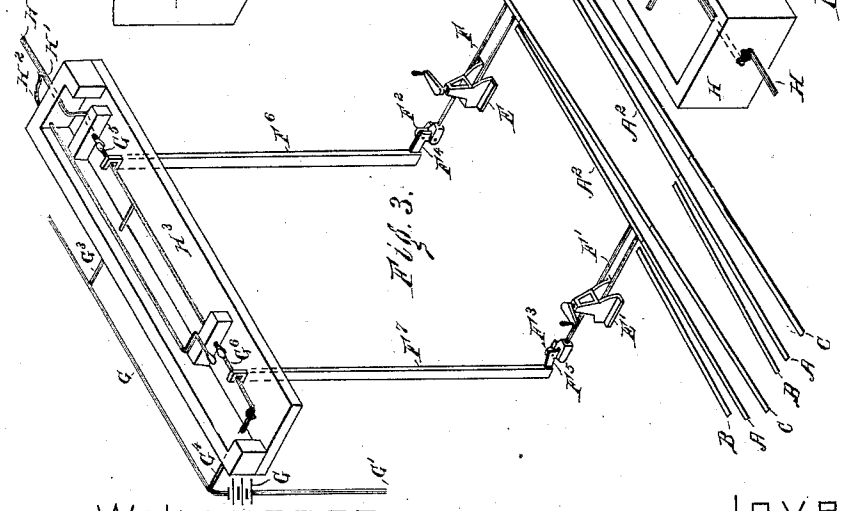


Fig. 3.

Witnesses—
Gertrude M. Day
Kirkley Hoyde.

Inventor—
Abiel Pevey
By Albert W. Moore,
His Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 3.

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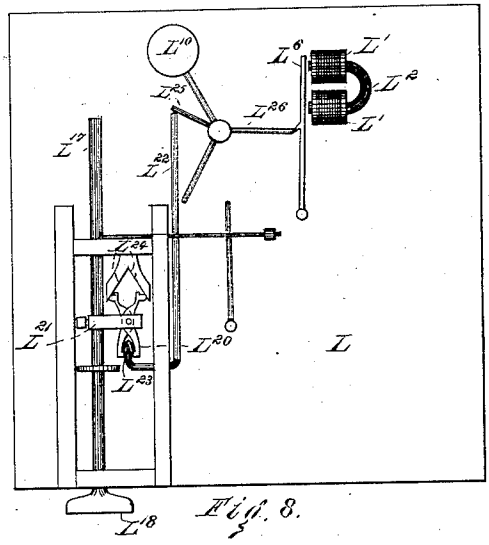


Fig. 8.

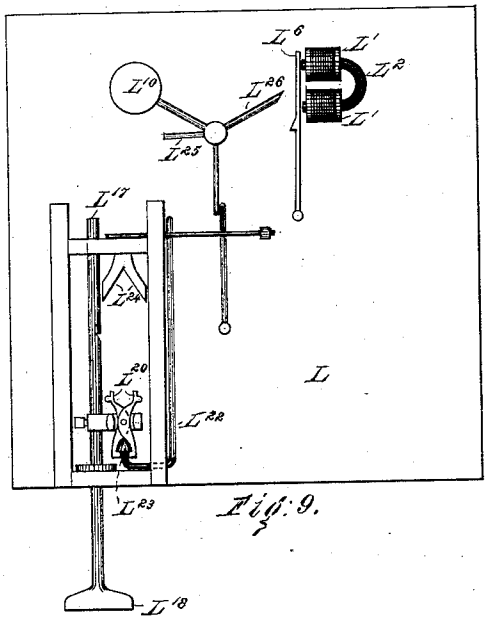


Fig. 9.

Witnesses—
Gertrude M. Day
Kirkley Hyde.

Inventor—
Abel Pevey,
By Albert W. Moore,
His Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ABIEL PEVEY, OF LOWELL, MASSACHUSETTS.

RAILWAY-SWITCH ALARM.

SPECIFICATION forming part of Letters Patent No. 333,665, dated January 5, 1886.

Application filed October 22, 1881. Serial No. 44,351. (No model.)

To all whom it may concern:

Be it known that I, ABIEL PEVEY, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Railway-Switch Alarms, of which the following is a specification.

My invention relates to devices by means of which the fact of a misplaced switch will be indicated to the engineer of a locomotive-engine by an audible signal produced on or within the cab of such locomotive in season to stop the engine before reaching such switch.

In the accompanying drawings, Figure 1 is a general perspective view of a railway-track with branches and switches, the cab of a locomotive-engine on said track, the battery, wires, and circuit-closing devices herein described. Fig. 2 is a detached view of a gong, hammer, and spring, such as is attached to said cab. Fig. 3 shows the track, switches, bell-crank levers, rods, and the circuit-closers, which are operated by the switches. Fig. 4 is an enlarged view of the bell-crank lever and a part of the connecting-rod and a part of the vertical rod. Fig. 5 is an enlarged perspective view of the drop, weighted lever, catches, electro-magnet, armature, and connected parts, the drop being raised. Fig. 6 is a front elevation of the parts shown in Fig. 5, the drop being down in a position to ring the gong on a locomotive-cab passing on the track below said drop, the cab and track being also shown. Fig. 7 is an oblique view of the top of the cab and of the mechanism used to close the circuit by the passing of the cab. Figs. 8 and 9 are elevations of modifications of the devices shown in Fig. 5, the drop being raised in Fig. 8 and being down in Fig. 9, and devices for setting the alarm.

A represents the main track, A′ and A^2 being switch-rails of the same, and B and C are branch tracks or sidings. The locomotive-cab D is supposed to be moving from right to left over the main track, except in Fig. 6, where the cab is represented as moving directly away from the observer. The tracks are switched in the usual manner by switches E E′ of the ordinary construction, which move the free (or left) ends of the switch-rails, the other ends of said switch-rails being stationary. The free end of each switch-rail is connected by the rod F F′ to a bell-crank, F^2 F^3, turning upon a pivot, F^4 F^5. A vertical rod, F^6 F^7, is pivoted to each of the bell-cranks F^2 F^3; hence the operation of the switches E E′ raises or lowers the rods F^6 F^7.

G is a galvanic battery, one pole of which is connected with the ground by the wire G′, the other pole being connected with one end of the wire G^2, the other end of said wire G^2 being unconnected.

G^3 G^4 are branches of the wire G^2, and terminate in steel or other metallic springs, G^5 G^6, which run through holes in the rods F^6 F^7, near the top of said rods, so that the free ends of said springs are raised or lowered by the above-described operation of the switches E E′. The wire H has as many branches H′ H^2 as there are switches E E′ to be used in connection with it, and these branches are of such a length and position that the raising or lowering of the rods F^6 F^7 will bring the ends of the springs G^5 G^6 into or out of contact with the ends of said branches H′ H^2—that is, when the tracks and switches are in the position shown in Fig. 3, raising the rod F^7 will bring the spring G^6 into contact with the end of branch H^2, while raising the rod F^6 (by setting the misplaced switch E so as to make the main track A continuous) will throw the spring G^5 out of contact with the branch H′. When the main line A is open throughout, there will be no contact between either spring G^5 G^6 and the corresponding branch, H′ H^2, and of course when either switch is misplaced there will be a connection between the wire H and the battery G through the wire G^2.

It is well to inclose the tops of the rods F^6 F^7, the springs G^5 G^6, and the branches H′ H^2 in the box H^3, to secure them from the weather and to prevent their being tampered with.

The wire H runs along the track to an alarm-station at L, (which station should be far enough from the switches to allow of the trains being stopped, if the proper signal is made at such station, before reaching the misplaced switch,) and runs far enough beyond said station L to allow of the drop falling before the train (approaching from the right of the drawings in Figs. 1 and 3) can reach said station after closing the circuit at H^5, as hereinafter

described. The wire H terminates in a spring, H^4, similar to those above described, within a box, H^5, used for a similar object to that for which the box H^3 is used. At right angles to said spring H^4 is a horizontal shaft, I', supported and turning in the box H^5, and in an arm, I^2, projecting from said box H^5. This shaft has an arm, I^3, projecting from it, which reaches under or around the spring H^4, and another arm, I^4, hanging vertically beneath said shaft in a position to be struck by the projection D' on the cab D. The projection D' may be rigidly affixed to the side of the cab, as in Figs. 1 and 7, or on the top of the edge of the roof of said cab, as in Fig. 6; or, instead of being rigidly secured to the cab, may be removable or adapted to be drawn in flush with the side or top of the cab when the engine is engaged in shifting. When the projection D' strikes the arm I^4, the shaft I' rocks, and the other arm, I^3, of said shaft depresses the spring H^4 (see Fig. 7) down upon the end of the wire J, so that if the wires G^2 and H are also connected the wire J is connected with the battery G. The wire J runs back from the box H^5 to the alarm-station L, and thence to the ground, as shown in Fig. 1, forming with the wires G^2 G' H an open circuit, to be closed only by the misplacing of the switch E or E' and the rocking of the shaft I'. The wire J is properly connected with the spools L' of an electro-magnet, L^2, so that when the circuit is closed the armature L^3 is attracted by the magnet and draws with it the spring L^4, secured at its lower end to the box or station L. The spring L^4 is provided with a catch, L^5; but the spring and armature may be the same piece, (L^5, in Figs. 8 and 9,) in which case the wire or cord L^1, which connects them, (if made of separate pieces,) may be dispensed with. A three-armed lever, L^8, is pivoted to the station L at L^9, so that, if allowed to do so, the weighted arm L^{10} will fall forward, throwing the second arm, L^{11}, back against the top of the lever L^{12}, causing the latter to turn upon its lower pivoted end and to draw the sliding rod L^{13}. The rod L^{13} is supported by the bracket L^{14} and by the side of the frame L^{15}, and has a loop, L^{16}, which rests against the lever L^{12}, and causes the rod L^{13} to move when said lever is moved. The drop L^{17} consists of a rod weighted at its lower end, L^{18}, and sliding vertically in the frame L^{15}, secured to the box L. The drop L^{17} has a notch, into which the front end of the sliding rod L^{13} enters (when the drop is raised, as shown in Figs. 5 and 8,) to support said drop, because said sliding rod L^{13} is drawn toward the drop by the spring L^{19}, which is a spiral wire spring, connected at one end to the sliding rod L^{13}, and at the other end to the frame L^{15}.

Evidently, when the circuit is closed by the means aforesaid, the armature is drawn to the right, Figs. 5, 6, 8, 9, releasing the arm L^{26} of the lever L^8, which lever, being overbalanced by its weighted arm L^{10}, throws its arm L^{11} in such a manner as to draw back the slide L^{13} and allow the drop to fall and remain in a position to strike and draw back a hammer-lever, D^4, pivoted on the side of the cab D, as the latter passes on the track below, which lever D^4, being released as the cab passes farther along, is drawn by the spring D^2, so that the front end of said lever D^4 strikes the gong D^3 (also supported on the side of the cab D) and warns the engineer that the switch E or E' is misplaced. The lever D^4, instead of ringing the gong, might be connected by a cord to the whistle, so as to sound the same by the pulling of the cord.

In Figs. 8 and 9, raising the drop L^{17} also raises a clutch, L^{20}, supported upon an arm, L^{21}, projecting from said drop, and thereby lifts the vertically-sliding bent rod L^{22}, because the clutch engages with the enlarged button L^{23} upon the lower end of said rod L^{22}. The clutch is of the form commonly used in pile-drivers, and consists, as shown, of two levers pivoted to each other and to the arm L^{21}, and has at the lower end inward projections, which, the clutch being spread apart by falling down upon the double-inclined button L^{23}, are brought nearly together under said button, the under side of said button being flat. Raising the drop L^{17} high enough, the upper ends of the clutch L^{20} are brought together by striking the inclines L^{24}, which disengages the clutch from the button and allows the rod L^{22} to fall; but the rod L^{22}, when raised, strikes a fourth arm, L^{25}, of the lever L^8, and brings the arm L^{26} under the catch L^5, when the alarm is ready for use.

It will be seen that to complete the circuit there must be a misplaced switch at the time when the connection is made between the wires J and H, and that if the projection D' be removed or drawn out of the way of the arm I^4 there will be no action at the alarm-station L; also, that the arm I^4 and the drop L^{17} are placed so near the edge of the track and of the cars as not to interfere with persons whose business requires them to walk on the top of the cars; also, that any number of switches placed near to each other may be put in the relations above described with a single alarm-station, L; also, that the alarm might, on the principle of the devices herein described, be used to indicate to the ear or to the eye that the switch was properly placed.

I claim as my invention—

1. The combination of the drop provided with a notch, the sliding piece adapted to enter said notch, the armature of an electro-magnet, and means for connecting the same with said sliding piece, and the lever, spring, and gong supported upon the cab of a locomotive, as and for the purpose specified.

2. In combination with the wires G' G^2 H J and stationary battery G and circuit-closer of the open electrical circuit, a railway-switch, E, and connecting mechanism, a locomotive-cab, D, provided with a projection, D', and mechanism for connecting the same with said wires to close said circuit by the operation of

said switch and by the movement of said cab, as herein described.

3. In an electric signaling apparatus for railways, a drop, and means, substantially as described, whereby, upon the closing of an electric circuit by the misplacement of a switch and by the subsequent approach of a locomotive toward said switch, said drop will be caused to fall into a position to be struck by a lever pivoted on said locomotive and to draw said lever back against the resistance of a spring, the subsequent contraction of which spring will draw forward said lever against a gong secured to said locomotive, in combination with said lever, gong, and spring, as and for the purpose specified.

4. In an electric signaling apparatus for railways, a drop provided with a notch, the slide adapted to enter said notch, the electromagnet, the armature, the weighted lever held in position by said armature and released upon the closing of the circuit by the misplacement of a switch and by the subsequent approach of a locomotive toward said switch, the lever pivoted upon said locomotive adapted to engage with said drop, whereby the lever will be drawn back against the resistance of a spring, the subsequent contraction of which spring will draw forward said lever against a gong secured to said locomotive, in combination with said lever, gong, and spring, as and for the purpose specified.

ABIEL PEVEY.

Witnesses:
ALBERT M. MOORE,
EDWARD W. THOMPSON.