

G. GLEDHILL.

AUTOMATIC RAILROAD SIGNALS.

No. 181,833.

Patented Sept. 5, 1876.

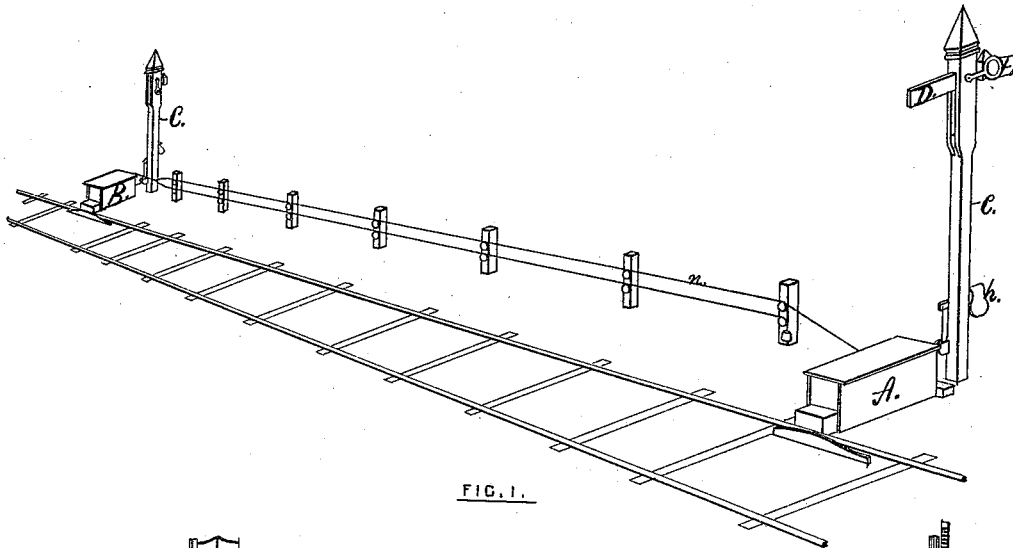


FIG. 1.

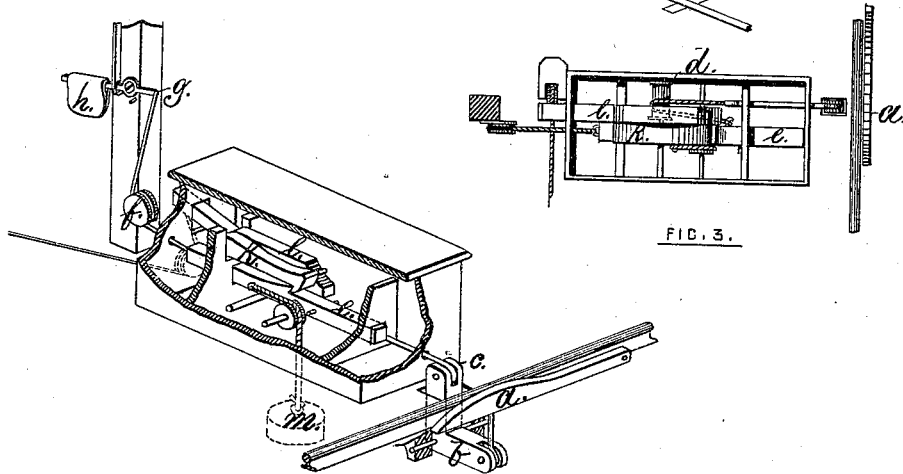


FIG. 2.

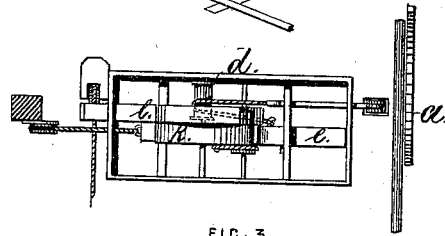


FIG. 3.

WITNESSES.

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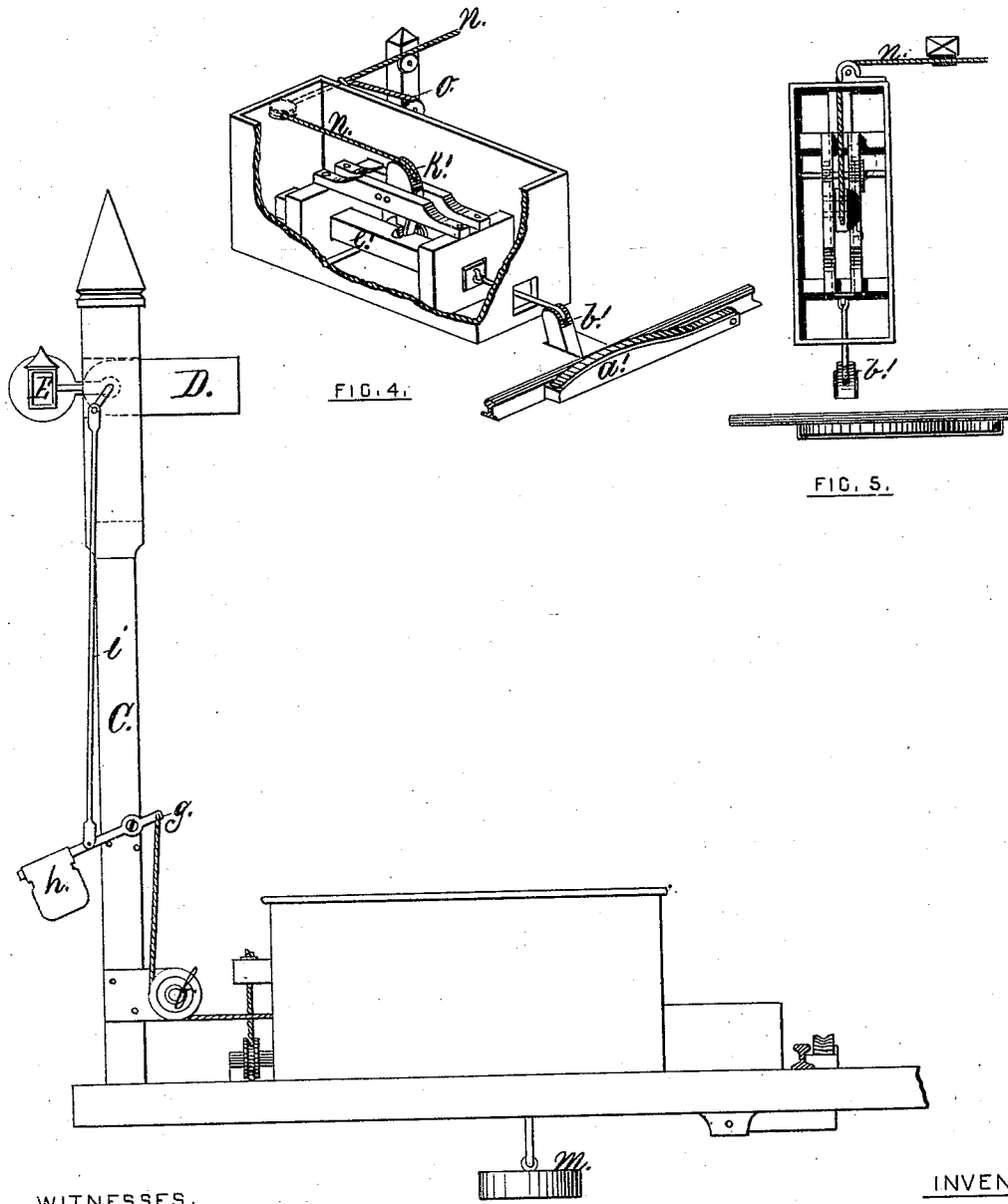
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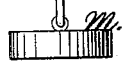


FIG. 6.

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UNITED STATES PATENT OFFICE

GEORGE GLEDHILL, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF PART OF HIS RIGHT TO THOMAS BOOTH, JOSEPH EASTWOOD, AND ABBEL BOWER, OF SAME PLACE.

IMPROVEMENT IN AUTOMATIC RAILROAD-SIGNALS.

Specification forming part of Letters Patent No. **181,833**, dated September 5, 1876; application filed May 20, 1876.

To all whom it may concern.

Be it known that I, GEORGE GLEDHILL, of Providence, in the county of Providence and State of Rhode Island, formerly a resident of Slaithwaite, in the county of York, England, have invented certain new and useful Improvements in Automatic Railroad-Signals; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a perspective view, showing the application of my automatic railroad-signal. The position of the signals is shown as indicating that a train has passed the first or nearest signal-post, but has not passed beyond the second, the road between the two posts being therefore shown as not clear. Fig. 2 is a perspective view of the box, partly broken away to show the interior mechanism by which the signals are automatically raised by the passing train. Fig. 3 is a top view of the mechanism by which the danger-signals are automatically raised by the passing train. Fig. 4 is a perspective view of the box, parts of which are cut away to show the mechanism by which the danger-signals are lowered automatically by the passing train, and thus indicate that the road is clear. Fig. 5 is a top view of the mechanism by which the danger-signals are automatically lowered by the passing train. Fig. 6 is an enlarged side view of the signal-box, signal-post, and the signals shown as indicating "danger," or that the next "distance" is occupied by a train.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a strikingly noticeable signal system for railroads, operated automatically by the passing of a train, that shall be simple in construction and operation, raised and lowered by the train, always reliable, and shall indicate the condition of each successive distance or section of a railroad to the engineer of the locomotive; and consists in the novel arrangement of the mechanism by which a strikingly noticeable signal is raised in the immediate

sight of the engine-driver, automatically, as the train passes along the line, which signal remains in position, and serves as a warning or danger signal to any succeeding train until the train which has raised it arrives at the next or distance-signal point, when, by means of a wire connection, the first signal drops, and a similar one is raised exactly in the same way as the first, which is repeated along the whole length of the railroad, and by every train passing along the line.

By night, a light in a properly-arranged lantern indicates the signal by the different-colored slides, which are placed before the light, so that by day or night the locomotive-engineer is aware of the condition of each section of the road, and also leaves a warning-signal for all trains that follow him.

In the drawings, A is the box containing the mechanism for raising the signal, and B the box containing the mechanism for lowering the same. Both of these boxes may be placed below the surface of the road-bed. Being contained in perfectly tight boxes or receptacles, neither rain, water, dirt, nor frost will interfere with the perfect working of the mechanism. C C are the signal-posts. D represents the day-signal, and E the night-signal or lantern.

The mechanism consists of the hinged arm *a*, placed inside and along the side of the rail, and is connected by a rod with the bell-crank *b*. When the train passes along the line the flange on the first wheel depresses the hinged arm *a*, and thus operates the bell-crank *b*. Connected with the bell-crank *b*, at *c*, is a wire, rope, or partially-flexible rod, which, passing over the drum *d*, is secured to the slide *e*. The depression of the hinged arm *a*, operating the bell-crank, therefore slides the slide *e* backward. To the end of the slide *e* a wire or wire-rope passes over the sheave *f*, and is secured to the lever *g*, which, turning on the central fulcrum, and weighted at the opposite end by the weight *h*, is allowed to turn down at the weighted end as soon as the slide *e* is moved back, and the signals are thus operated. As the signals must remain for a given time in the raised position, the pawl *k* at this

moment engages with the projection on the slide *e*, and thus retains the same, as is shown in Figs. 2 and 3.

l is the trip-lever, which is operated from the box B, and serves to release the pawl *k* and slide *e*, and the weight *m*, secured to a cord passing over a sheave, and having the other end secured to the slide *e*, pulls the slide forward, and thus again in its first position, and ready to be operated upon by the next train.

In Fig. 4 it will be seen that the connecting-rod *i* connects the arm *g* with the signal D and the colored slide E, so that as soon as the arm *g* is relieved the signals are raised by the simplest and most certain means—viz., a weight. It will be also seen that as soon as the pawl *k* relieves the slide *e* the weight *m* lowers the signal and replaces the parts, so as to be ready for the next train. These simple and effective arrangements of operating all the mechanism by dead weight form one of the most valuable features in this improved automatic signal apparatus.

The train, having raised its own signal, passes on, leaving the danger-signal to any other train following until the first train reaches the end of the section, when it passes over the hinged arm *a'* (in all respects similar to the arm *a*) at the box A. This arm *a'* is connected with the mechanism in the box B by means of the bell-crank *b'*, which is operated in all respects like the bell-crank *b* in box A. From the end of the bell-crank *b'* a cord or wire extends to the sliding bar *e'*, on which a pawl is secured, and when the sliding bar *e'* is drawn forward by the bell-crank *b'*, this pawl passes beyond the hinged arm *k'*, to the upper end of which the cord *n* is secured. This cord *n* extends to the box A, and is also secured to the trip-lever *l*; and as soon as the train has passed over the hinged arm *a'*, the sliding arm *e'* is pulled back by the weight *m'*. The pawl engages with the lower end of the hinged arm *k'*, and moves the upper end forward, thus drawing in the cord *n*, and raising the pawl *k* in the box A by means of the trip-lever *l*, when the signals are at once lowered by the weight *m* operating the slide *e*, and thus raising the weight *h* on the arm *g*.

Instead of raising the signal as the train passes the signal-post, the same mechanism may be employed to raise the signal at any required distance ahead of the train, and thus allow two signals (one ahead of the train and one behind the train) to be raised, so that another train, no matter from which direction it comes, may be aware that the section beyond the signal is occupied by a train; thus instantly apprising the engineer of the approaching train of any stoppage or accident which may have occurred on the line beyond or in front of any train which may be running, so that the train may at once be brought to a stand, and all danger or accident avoided.

The invention is so simple and operated by

the most positive means (a weight) that any ordinary mechanic can arrange the same.

The operation being entirely automatic, as the trains run along the line, they operate the signals and indicate to the following trains the necessity of caution or the assurance of a clear line. No special employes under daily pay are required, and the safety of passengers and goods does not depend on the vigilance and reliability of the persons employed.

When this automatic signal is placed on a railroad having a single track, one of the boxes A, provided with the mechanism described, is placed on each side of the signal-post, so that the signal is raised from whichever side or direction the train may be approaching, while the box B is connected with the signal-posts in both directions, so as to lower the signals when the train passes the box B. By this arrangement, so long as the signal mechanism is kept in proper condition, all the movements of the trains in either direction will be automatically signaled to succeeding or approaching trains, and such accidents as are now common, causing destruction of life and property, will be avoided.

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

1. In an automatic railroad-signal apparatus, the combination, with the signal-board and signal-lantern, of the hinged arm *a*, the bell-crank *b*, slide *e*, pawl *k*, and weighted lever *g*, arranged and operating substantially as and for the purpose set forth.

2. In an automatic railroad-signal, the combination, with a day and night signal, of the hinged arm *a*, arranged by the mechanism, substantially as described, to release the weighted lever *g*, and thus raise the signal, as and for the purpose set forth.

3. The combination of the hinged arm *a'*, the bell-crank lever *b'*, the slide *e'*, and hinged arm *k'*, arranged to operate the disengaging mechanism, substantially as and for the purpose described.

4. In an automatic railroad-signal, the combination, with a day and night signal, of the arm *a'*, the slide *e*, pawl *k*, lever *g*, and weight *m*, arranged so as to lower the signals, substantially as and for the purpose specified.

5. The combination, with the slide *e*, pawl *k*, and lever *g*, of the weight *m*, arranged and operating substantially as and for the purpose described.

6. In an automatic railroad-signal, the combination, with a day and night signal, of the hinged arms *a* and *a'*, the weighted lever *g*, and weight *m*, and the intermediate mechanism, substantially as described, arranged to raise and lower the signals, substantially as described.

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Witnesses:

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