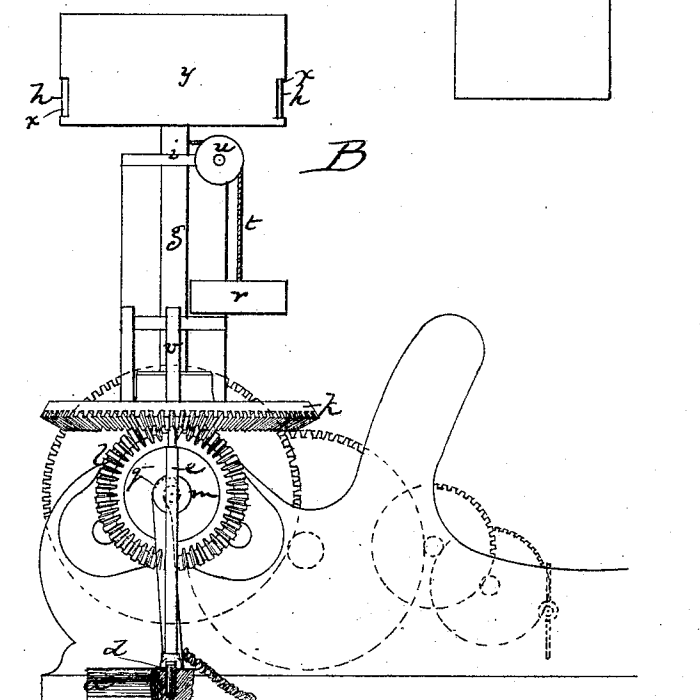
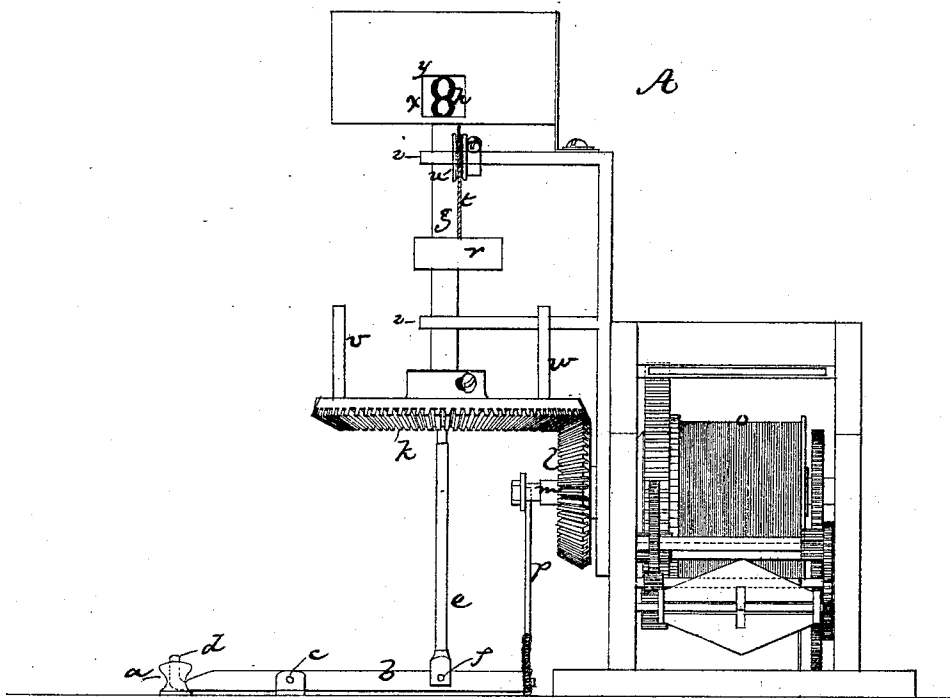


T. S. FOSTER & W. A. FOSTER.
Improvement in Time-Signals for Railroads.
 No. 128,383. Patented June 25, 1872.



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UNITED STATES PATENT OFFICE.

THEODORE S. FOSTER AND WILLIAM A. FOSTER, OF FITCHBURG, MASS.

IMPROVEMENT IN TIME-SIGNALS FOR RAILROADS.

Specification forming part of Letters Patent No. 128,383, dated June 25, 1872.

To all whom it may concern:

Be it known that we, THEODORE S. FOSTER and WILLIAM A. FOSTER, both of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improved Railway-Signal Mechanism; and we do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

Our invention relates to the construction of a signal mechanism to be used upon railways for the purpose of designating at stations and other points, and to trains approaching thereto, the condition of the road ahead as regards a previously-passed train, or the length of time such a train has been gone, so that, at least up to a time when one train may with perfect safety follow a previous one, it may always be known to an engineer how many minutes or how many miles ahead a train may be. In our invention we employ a horizontal shaft, (actuated by a weight or spring,) and near one end of this shaft we place a vertical shaft, journaled in suitable bearings, and bearing at its top a signal-wheel, this shaft being mounted on a lever and made capable of a slight vertical movement, its upward movement being effected by depression of one end of the lever by the wheel of a car, and said upward movement causing a hook or arm attached to the opposite end of the lever to be carried over the first-named shaft, said upward movement also carrying a gear-wheel on the vertical shaft out of engagement with a gear-wheel on the primary shaft, so that by means of a suitable weight the signal-wheel is turned to its starting-point, and the rotation of the primary shaft causing the hook or arm to ride off and fall from it, thereby letting the vertical shaft down, so that its gear is carried into gear with the gear of the driving-shaft, the rotation of which shaft will cause the signal-shaft gear to be rotated and the signal-wheel to be turned, and the latter wheel, by its turning, showing through a suitable case the length of time or number of minutes that the last train has passed. It is in this general construction that our invention consists, or in a signal-wheel placed on a vertical shaft thrown to its start-

ing-point, and into engagement with an actuating-mechanism by the passing of a train, so that as the train moves the signal or index-wheel turns in such regular manner that its face or faces designate the time elapsing after departure of the train.

The drawing represents a signal mechanism embodying our invention.

A shows the mechanism in end view. B is a side elevation of it.

a denotes a railway rail; *b*, a lever fulcrumed at *c*, and having at one end a pin or upturned arm, *d*, that is so arranged with respect to the rail that the wheel of a car depresses it and raises the opposite arm of the lever. *e* is a vertical rod pivoted to said lever, (as seen at *f*;) and having resting upon its top a shaft, *g*, at the top of which is the signal-wheel *h*, the shaft rotating upon the rod in suitable stationary bearings *i*, and it and the rod being capable of vertical movement together. Upon the shaft is fixed a bevel-gear, *k*, which gear, when the rod *e* and shaft are raised, is free, but when the shaft and rod are let down falls into engagement with a bevel-gear, *l*, on a shaft, *m*, which shaft *m* may have rotative movement imparted to it by means of a weight attached to a cord or chain winding upon a barrel, *o*, or by any other suitable power, any suitable mechanism being employed to regulate and make uniform the velocity of the shaft. At the end of the long arm of the lever *b* is jointed an arm, *p*, at the top of which is a bend or shoulder, *q*, which shoulder is drawn toward the shaft *m* by the stress of a suitable spring, so that when the rod *e* and shaft *g* are raised (and the wheels *k l* thereby disengaged) the spring draws said shoulder over the shaft, as seen at B, thereby locking the shaft *g* and its wheel *h* in a position in which the wheel *l* is out of engagement with the wheel *k*, the rotation of the shaft *m* quickly dislodging the shoulder *q* and letting down the lever *b*, and the rod *e*, shaft *g*, and wheel *k* re-engaging the wheels *k l*, but not until, by the action of a weight, *r*, the signal-shaft and its signal-wheel and gear-wheel are turned back, said weight *r* being suspended from a cord, *t*, (which cord is attached to the shaft, and runs on a guide-sheave, *u*;) or by any other equivalent means, a stop-pin, *v*, or

other suitable device arresting the back movement of the wheel *k* when the signal-wheel has reached its starting-position.

The operation of the mechanism is as follows: The signal-wheel having been turned forward by the action of the weight or spring, (after passage of a train,) and having been stopped by a pin, *w*, striking a stop-plate, or by other suitable means, the mechanism is in position to be again operated by a passing train, the first wheel of which depresses the pin *d* and raises the opposite arm of the lever, so that by the stress of the spring *s* the shoulder *q* is drawn over the shaft *m*, the rod *e*, shaft *g*, wheel *k*, and signal-wheel *h* being raised by the lever and fastened in their raised position by the shoulder *q* of the arm *p*. The rise of the wheel *k* disengages it from the wheel *l* and leaves it free to turn, and the weight *r*, operating upon the shaft *g*, turns back the shaft and carries the signal-wheel *h* back to its starting-point. The rise of the wheel also leaves the wheel *h* free to be turned by the weight or spring that actuates the shaft *m*, and the shaft immediately commences to rotate, and dislodges the riding shoulder *q*, which dislodgement enables the lever *b* and the mechanism supported upon it to fall, the fall of the wheel *k* bringing it into engagement with the driving-wheel *l*, so that as soon as the train has passed the wheel *l* turns the wheel *k*, and thereby moves the signal-wheel *h*, which in its movement brings the successive numbers or figures, indicative of miles or minutes, successively before the opening *x* in the box or case *y*, and shows to the advancing train, if close upon the other, that the prior train can have gone but so far, or but so many minutes, enabling him to know, by such information, whether or not it will be safe to go on, the rate of movement of the signal-wheel being such that the information conveyed by the

signal-wheel is reliable. The speed and regularity of such movement can of course be effected by any suitable actuating and regulating mechanism or train of mechanism. A mechanism substantially like that shown is simple, effective, and inexpensive, and needs no care, except occasional inspection, to see that the parts are in working order, and always indicates the proximity of a prior train, if such train has not been gone sufficiently long to make it perfectly safe for another train to follow.

We do not claim broadly the disengagement and setting of a time-indicator by the action of a passing train.

1. We claim the horizontal rising and falling signal-wheel *h*, supported upon a lever, *b*, which is actuated by the wheel of a car, said signal-wheel being fixed on a vertical shaft, which, by connection with a driving-shaft, is turned to cause the signal-wheel to indicate the time or distance that a train has passed, the wheel being first put out of gear by the action of the car-wheel upon the lever, and then returning to its starting-point, and then dropping into gear and starting forward by such reconnection.

2. We claim the combination of lever *b*, signal-wheel *h*, supporting-shaft *g*, and arm *p* with its bent end *q* resting on the shaft *m* until, by the rotation of the latter, it is thrown off, bringing the indicator into connection with the driving mechanism, substantially as shown and described.

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