(No Model.) 2 Sheets—Sheet 1.

# P. N. MARTIN.

## OPERATING MECHANISM FOR RAILWAY SIGNALS.

No. 343,329. Patented June 8, 1886.

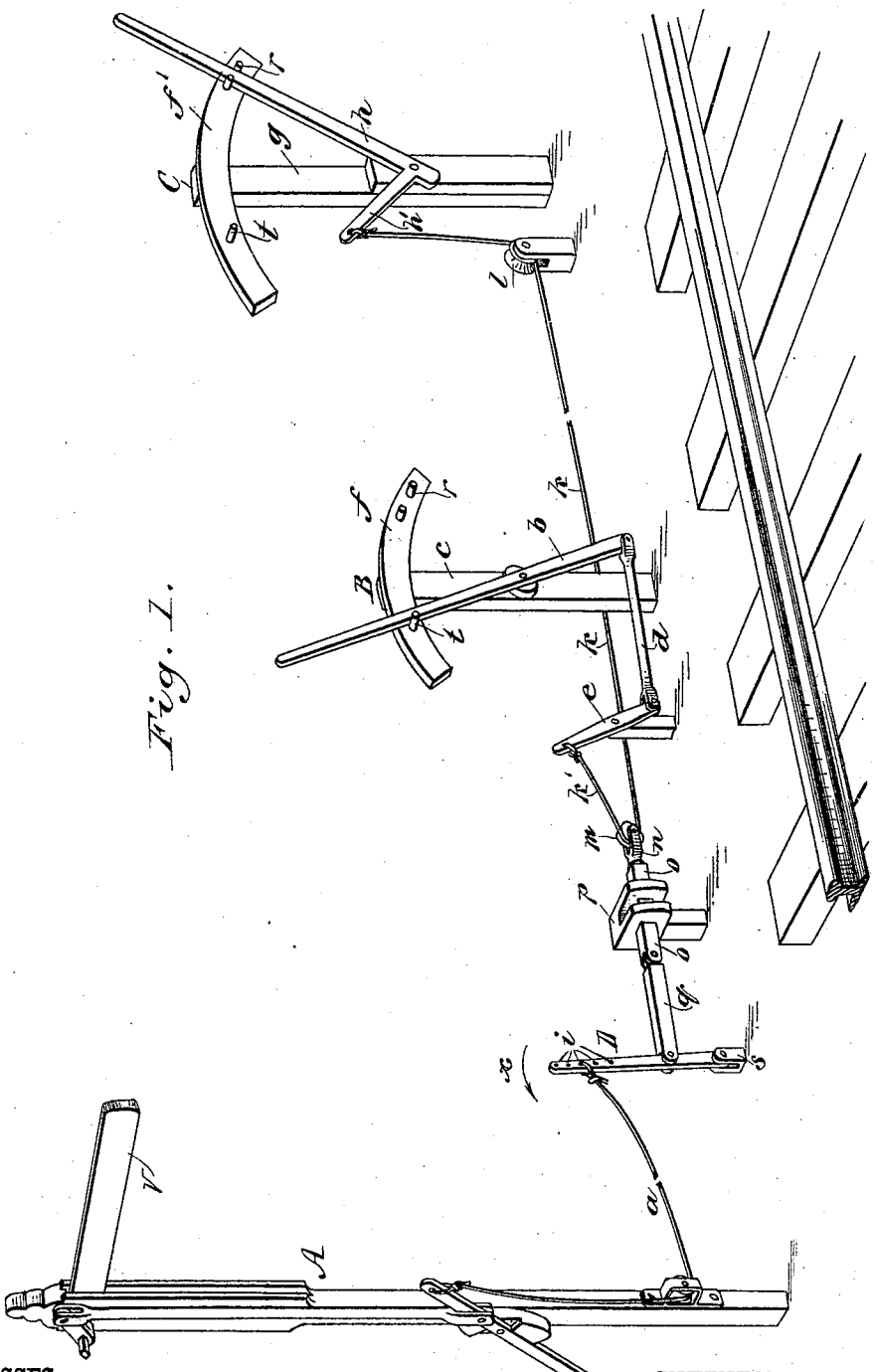

Fig. 1.

WITNESSES:

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INVENTOR:

P. N. Martin

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(No Model.) 2 Sheets—Sheet 2.

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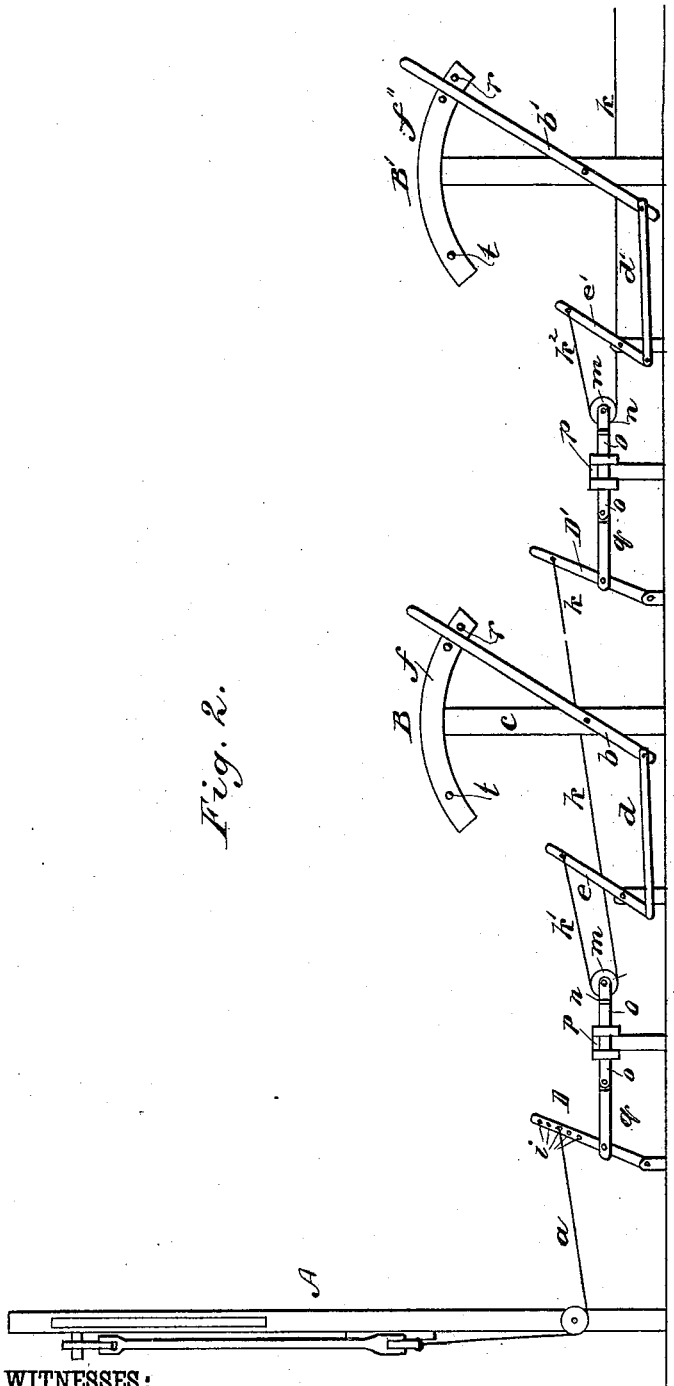

Fig. 2.

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# UNITED STATES PATENT OFFICE.

PETER NELSON MARTIN, OF MADALIN, NEW YORK.

## OPERATING MECHANISM FOR RAILWAY-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 343,329, dated June 8, 1886.

Application filed September 4, 1885. Serial No. 176,174. (No model.)

*To all whom it may concern:*

Be it known that I, PETER NELSON MARTIN, of Madalin, in the county of Dutchess and State of New York, have invented a new and Improved Operating Mechanism for Railway-Signals, of which the following is a full, clear, and exact description.

The object of my invention is to provide a construction whereby a single signal can be operated by a single line-wire from any number of points desired, but which having once been set to "danger" from one or more of the signal-stations, cannot be set to open the line until all of the signal-stands have been moved to "safety."

My invention relates to the construction of a railway-signal; and it consists of certain novel constructions and combinations, to be hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a perspective view of a semaphore arranged to be operated by my improved mechanism from two points, and Fig. 2 is a diagram illustrating the manner in which additional stations are placed on the main line.

Referring now to the general construction illustrated in the drawings, A represents the ordinary form of semaphore, which is operated by the wire *a* and mesne connections from the signal-stands B and C, as will be explained.

In the ordinary construction in use prior to the date of my invention the wire *a* has extended directly from the signal A to the signal-stand, and consequently but a single stand could be connected with the signal. By the use of my invention, however, two, three, four, or more stands can be connected with the same signal and operate it with perfect safety to the line, as will hereinafter appear.

In Fig. 1 I illustrate my arrangement for operating the signal from two stands, and it is to be understood that the distance between the stands B and C is supposed to be anywhere from one thousand to thirty-five hundred feet. The stand B is shown as consisting of a lever, *b*, pivotally mounted on a standard, *c*, and connected by a pitman, *d*, with the short arm of a lever, *e*, the position of the lever *b* being regulated by pins or other holding devices carried by a rack, *f*, while the stand C is shown as consisting of a bell-crank lever, *h*, mounted on a standard, *g*, and held in position by pins or other holding devices carried by a rack, *f'*. The main-line wire is shown at *k*, and passes from the short arm *h'* of the lever *h* under a grooved sheave, *l*, and extends thence to a sheave, *m*, about which it passes, and is carried back any desired distance, not necessarily more than a few feet, to the long arm of the lever *e*, which is under the control of the lever *b* of the stand B, the short wire, reaching from the sheave *m* to the lever *e*, being shown at *k'*. The sheave *m* is carried by a block, *n*, which is secured to one end of a sliding bar, *o*, mounted so as to ride in slots formed in the stand *p*, the other end of the bar *o* being secured to a compensating-lever, D, by means of a connecting-link, *q*. The lower end of the lever D is pivoted in a socket, *s*, and to the upper end of this lever there is connected the wire *a*, which is a section of the main-line wire, and which leads directly to the signal A. The pins *t r* are limit pins or stops, and prevent the passage of the lever-arms *b* and *h*. It will be noticed that the upper arm of the lever D is provided with a number of holes, *i i*, the idea being to adjust the throw of the lever by attaching the wire *a* at a proper distance from the fulcrum.

Referring now to Fig. 2, and particularly to that part of it between the signal and the break in the wire *k*, which figure represents the signal and signal-stands in the position they assume when the line is open, it will be seen that the levers D, *e*, and *b* are all thrown over, so that their upper ends point away from the signal A; and now, referring once again to Fig. 1, it will be seen that the lever *b* of the stand B has been thrown over against the pin *t* of the rack *f*. This throw of the lever *b* carries the lever *e* over to the position shown in Fig. 1, thus slacking the wire *k'*, and permitting the weight W of the stand A to fall. Now, as the weight W falls it not only displays the danger-signal V, but it draws upon the wire *a*

and carries the lever D over in the direction of the arrow *x*, thus pulling the bar *o* through the slots in the stand *p;* but, as will be readily understood, the movement of the bar will be equal to but one-half of the throw of the lever *e* at the point where it is connected to the wire *k'*, and it is to increase the effect of the movement of the bar *o* that I employ the compensating-lever D, for with such a lever I am able to regulate the point of attachment of the wire *a*, so that it will move to a sufficient extent to permit the full rise of the arm V, and in an ordinary form of semaphore, such as that shown, this movement must be from sixteen to eighteen inches.

With the above explanation it will be seen that the line, having been closed by throwing the lever *b* of the stand B to disclose the danger-signal, cannot be opened until the switchman at B desires such opening of the line, for, as before stated, the lever *h* cannot be moved to pass the pin *r*. If, after B has set the line to "danger," C desires to have the danger-signal displayed, the lever *h* is thrown over against the pin *t*, both men knowing of some reason why the line should be closed. If, while the stands B and C are in the position just described—that is, both levers against their limit-pins *t*—one of the men should desire to open the line and should throw his lever—say the lever *b*—against the stop *r*, all that could be done would be to take up the slack in the line *k k';* but if C should now desire to open the line he could do so by throwing back his lever. It will therefore be clear that although either B or C, or both, can set the signal to "danger," it can only be moved to "safety" by the party or all the parties who have thrown their levers to display the danger-signal.

If three signal-stands are desired for a single signal, I arrange the first two stands as shown in Fig. 2, wherein we will suppose the stand B' to be one thousand feet from the stand B, a third stand being located, say, twenty-five hundred feet from the stand B', and operating the main wire *k*, as has been before described and shown at C in Fig. 1. To establish the stand B', I simply cut the main wire *k* and introduce such a sliding bar, sheave, and compensating-lever as has been hereinbefore described, the wire *k* passing back in the loop $k^2$, from the sheave *m*, to be connected with the lever *e'* of the stand B', and the farther end of the section of the wire *k* nearest the signal A being secured in one of the holes *i* of the lever D'. In such an arrangement any one of the three stands could set the signal to "danger," and if two, or all three, stands should be set to "danger" the line could not be opened until all of the stand-levers so set to "danger" had been returned to a position to move the signal to "safety."

By such an arrangement of operating mechanism as I have described the number of distinct signals required for a section of road can be greatly reduced, thus involving a saving that will readily be appreciated by railroad men. Another saving is effected by reason of the fact that a single line-wire will do for all the stands used to operate a signal placed to protect any particular point.

Although not shown in the drawings, it will be understood that the sliding bar, sheave, &c., are properly inclosed, to protect them from becoming clogged by snow, ice, hail, &c., or from being injured in any way by the weather.

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

1. The combination, with a signal and its main-line wire, of two signal-stands connected with such line-wire and an intermediate signal-stand also connected thereto, sliding bars and compensating-levers being interposed in advance of the two stands nearest the signal, substantially as described.

2. The combination, with a signal and its main-line wire, of two signal-stands, as B and C, a sliding bar, *o*, mounted in a stand and provided with a sheave, *m*, a connecting-link, *q*, and a compensating-lever, D, all parts being connected substantially as described.

3. The combination, with a signal and its main line, of two signal-stands, as B and C, a sliding bar, *o*, mounted in a stand and provided with a sheave, *m*, a connecting-link, *q*, and a compensating-lever, D, formed with apertures *i i*, all parts being connected substantially as described.

PETER NELSON MARTIN.

Witnesses:
FRANK S. ORMSBEE,
R. R. PEELOR.