(No Model.)

3 Sheets—Sheet 1.

R. S. WILES.

RAILWAY SIGNAL.

No. 515,807. Patented Mar. 6, 1894.

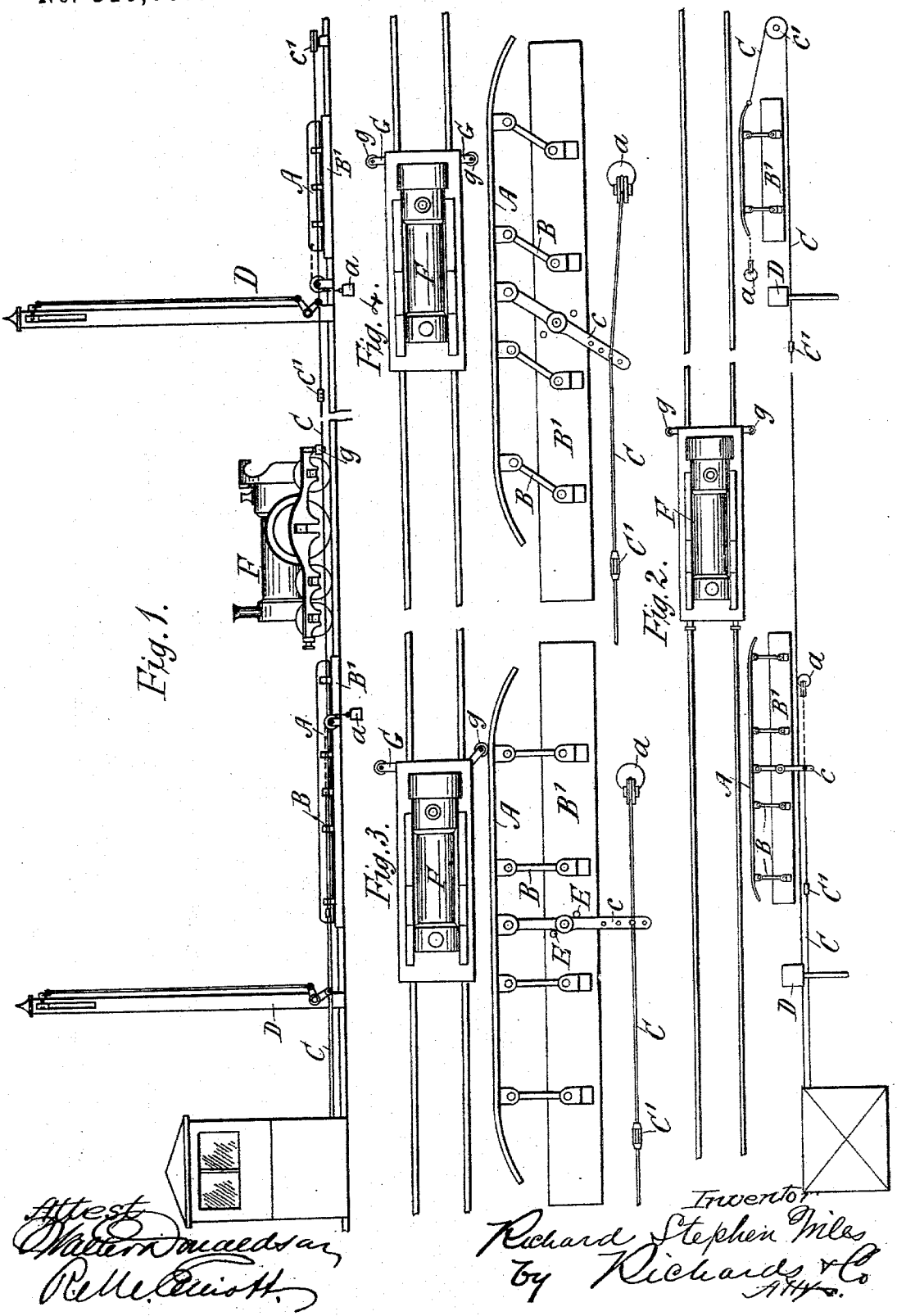

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Fig. 5.

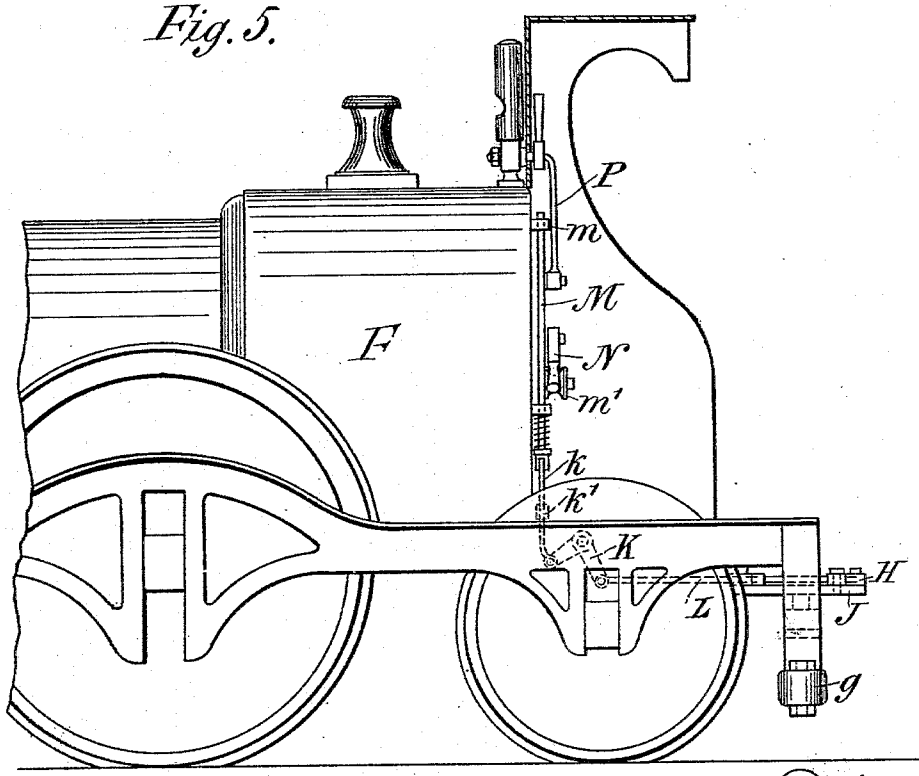
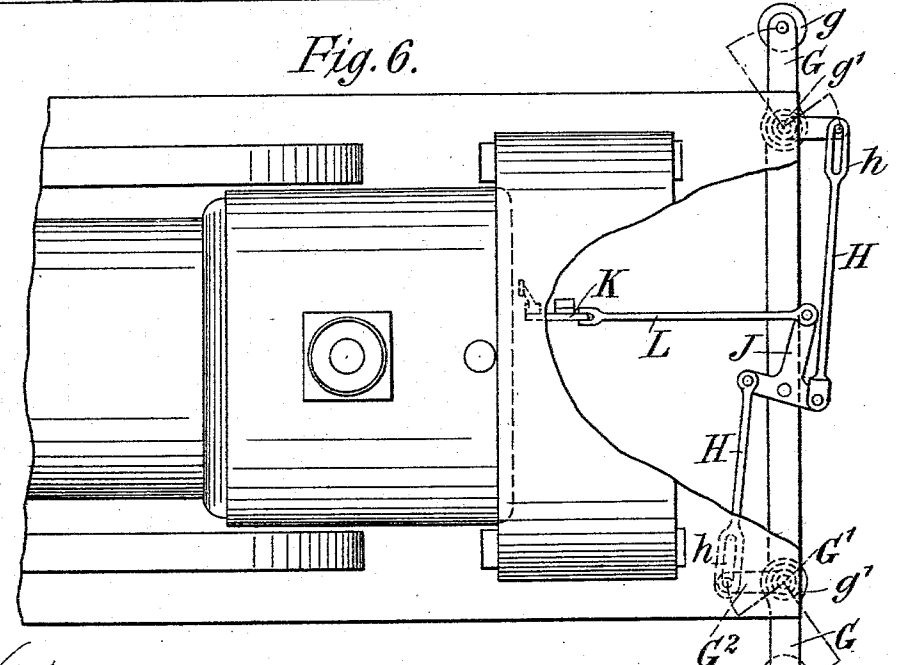


Fig. 6.



Witnesses
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(No Model.) 3 Sheets—Sheet 3.

R. S. WILES.

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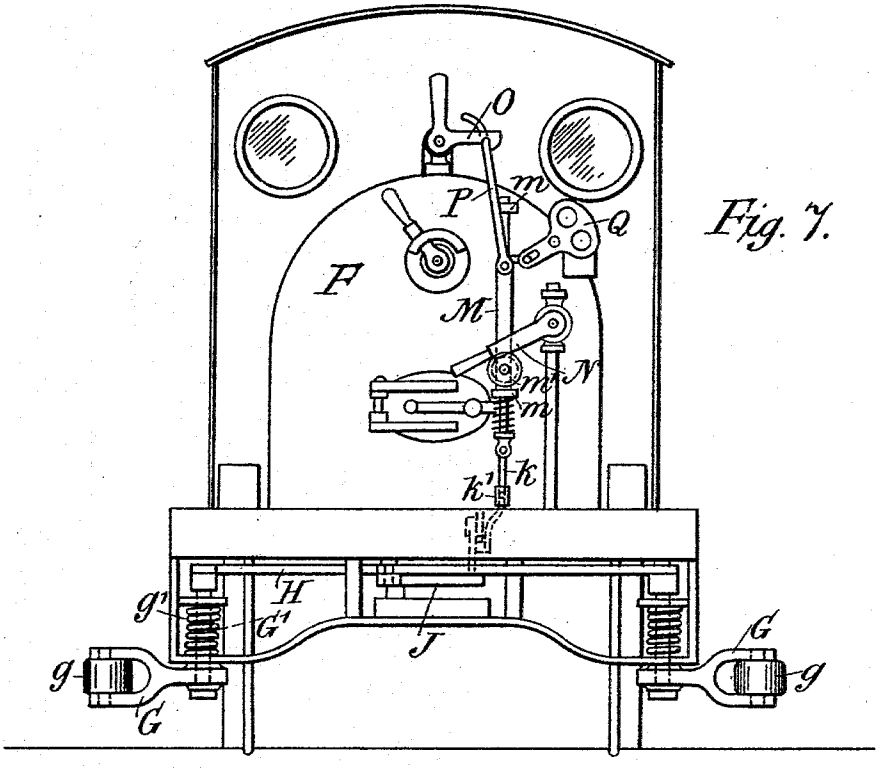

Fig. 7.

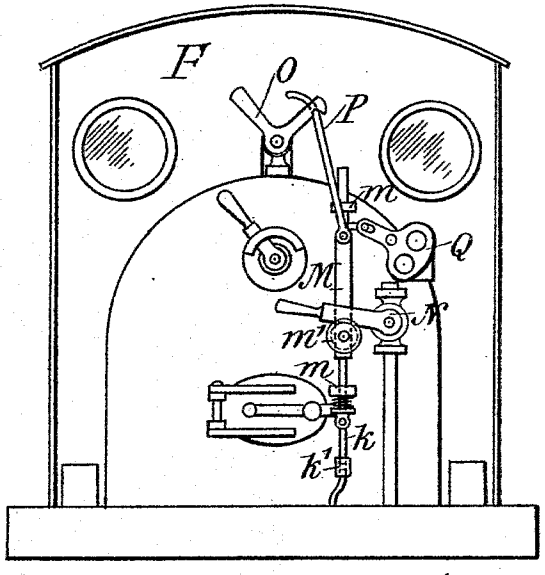

Fig. 8.

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UNITED STATES PATENT OFFICE.

RICHARD STEPHEN WILES, OF READING, ENGLAND.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 515,807, dated March 6, 1894.

Application filed December 17, 1892. Serial No. 455,453. (No model.)

To all whom it may concern:

Be it known that I, RICHARD STEPHEN WILES, telephone-manager, a subject of the Queen of Great Britain and Ireland, residing at 42 Addington Road, Reading, in the county of Berks, England, have invented certain new and useful Improvements in and Relating to Railway Signaling, of which the following is a specification.

This invention relates to improvements in railway signaling, in which the signals are operated from the signal box, and transmitted direct to the locomotive or guard's van, the arrangement being especially adapted for fog signaling.

In carrying out my invention, I employ a rail or bar at the side of the line and parallel to it, against which a lever on the engine or guard's van, carrying a friction roller at its end, abuts when the train passes, when the rail is in its ordinary position, mechanism being attached which will give a signal, and put on the brake, the rail being withdrawn when the signal is not required. The rail is mounted on a number of arms, in such a manner that it is always moved parallel to itself, and arranged so that its face is vertical, the device on the engine projecting horizontally to meet it. A weight is provided, which always brings the rail to the signaling position when released, the signal man pulling the lever to withdraw it. The wire, chain or rod from the signal box is attached to a lever on the rail or to the end of the rail. The rail is preferably operated at the same time as the ordinary signals, the wire or rod being also attached to the lever on the signal post, but it may be employed in their place if desired.

The apparatus on the engine or van consists of a small lever, projecting horizontally from the side and furnished with a friction roller, and a spring, which always brings it back to a position at right angles to the side of the engine or van, when released, the arrangement being such that the lever may be moved in either direction. This lever need not project beyond the step on the engine. An arm fixed to this lever is connected by a link to a bell crank lever at the center of the engine, which is again connected to another bell crank lever at right angles to it. This second lever actuates a sliding rod, which, when moved, turns the brake handle, putting on the brake, puts on the whistle and if desired, also operates a lamp signal or colored disk, showing a colored light by night and disk by day, differing in color according to the position the signal is in. The link connecting the arm of the striking lever with the bell crank lever at the center, is slotted at its outer end, the arm having a pin taking into the slot; so that should the lever be moved in the wrong direction, as may happen if the train is shunted on to a wrong line, it will be allowed to move freely without interfering with the other parts of the device. The sliding rod operating the brake and signals is furnished with a small wheel or projection bearing against the brake arm, so that the arm can be put on independently of the rod when desired, but cannot be moved to take off the brake, while the rod is in its operative position, that is, while the striking lever is held by the rail at the side of the line. A hinged arm is furnished on this rod, which moves the whistle arm, the arrangement being such that the whistle can be shut off by the driver whenever he desires it, after it has been put on by the signaling device, without interfering with any other part. A striking arm is furnished at each side of the engine, both connected to the bell crank lever but at opposite sides of the center, so that should the engine be traveling either end forward, the signals will be operated and the brake put on.

The arrangement of the signals on the line is as follows:—At the distance signal is placed a short rail, constructed as before described, and actuated from the signal post levers. If this is at danger, it will put on the brake and operate the signals on the engine, releasing them immediately the engine or car has passed, allowing the driver to turn them off when he desires. A warning is thus given to the driver, who, as is the custom when the distance signal is at danger, proceeds to slacken speed until he reaches the home signal. Should

this also be at danger when he arrives the signals and brake are operated again and the rail in this case being of greater length the train is automatically brought to a stand still before it passes the end of the rail. As the driver or guard cannot take off the brake and allow the train to pass on, while the striking lever is held by the rail, there is no chance of him making a mistake in starting too soon, as he will be prevented from doing so until the signal is clear. The starting signal may be given by withdrawing the rail, allowing the striking lever to return to its normal position and enabling the driver to take off the brake.

As above described, the device does not operate the lever or handle used for admitting steam to and shutting it off from the cylinder, that being left to the judgment of the driver, but it is obvious that it can be also employed for this purpose, if desired. Should the train have passed the distance signal before it has been put at danger, and it is desired to stop the train by the home signal, in the event of the train running at full speed up to the signal, it may not be stopped in the length of the rail, and in case of fog the signal to start must then be given by some separate arrangement, such as the means ordinarily employed.

In order that the invention may be more clearly understood, reference is had to the accompanying drawings, in which—

Figures 1 and 2 are respectively a side elevation and a plan, showing the general arrangement of the signals. Figs. 3. and 4 are plans of one of the signaling rails, with diagrammatic views of engine, showing the rail in on and off position. Fig. 5 is a side elevation; Fig. 6 a plan, and Figs. 7 and 8 are front elevations of the mechanism on the engine; Figs. 5, 6, and 7, showing it in its normal position, and Fig. 8 in operative position.

Referring to Figs. 1 to 4, A is the rail operating the device on the engine or car, and placed at the side of the line, with its face toward the line. This rail is carried by a number of arms B of equal length, pivoted to the support B′, and arranged so that the rail will always move parallel to itself. A weight *a* is attached to the rail which always brings it to signaling position when released, so that should any accident occur to the arrangement, such as breaking of the connecting wire, the signal will always stand at danger. The wire or chain C with coupling C′ for tightening purposes, passes from the signal box and is also connected to the lever on the signal post D, so that both signals are operated at the same time. The wire may be attached to the lever *c* to operate the rail or may pass over the pulley *c′* and be connected to the end of the rail. Stops E are furnished which prevent the rail moving beyond its extended position, thus preventing any chance of its being pushed aside by the striking lever on the passage of the train.

Figs. 1 and 2 show the double arrangement of the signaling rails, one at the distance signal and the other, preferably of greater length, at the home signal, for the purposes before described.

Referring to Figs. 5, 6, 7 and 8, F is the engine, carrying at its lower part, under the floor of the driver's box at each side, the striking lever G with roller *g*. The spindle G′ carrying the lever, is furnished with an arm G^2 and a spring *g′*, which brings the lever back to its middle position whenever released, allowing it to be moved in either direction. The arm G′ is connected to the link H by means of a pin working in the slot *h*, thus allowing the lever G to be moved in the wrong direction without pulling the link. The links H, one for each side, are connected to opposite arms of the bell crank lever J, which is connected to a second bell crank lever K, at right angles to it by the rod L. This second lever actuates, through the link *k*, the sliding rod M, moving in guides *m* on the face of the engine, and furnished with the small roller *m′*. A coupling *k′* is furnished, by means of which the link *k* can be adjusted in length, and a spring m^2, which brings the rod M and connecting levers back to normal position, when the striking lever is released. The arm N, by means of which the brake is operated, rests upon the roller *m′*, and is moved up by it when the rod is operated thus allowing the brake to be put on without interfering with the rod. To turn the whistle arm O, a hinged arm P, is provided on the rod M, bearing against the whistle arm. The whistle can thus be taken off immediately, by turning the arm aside, while the brake is held on all the time that the rod M is in the position shown in Fig. 8. The lamp signal Q is also operated by the rod M, two different colored glasses being employed as in ordinary lamp signals, moved in front of the lamp, one showing when the signal is clear as in Fig. 7, and the other, preferably red, when at danger, as in Fig. 8.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a projection on the railway track, a pivoted arm G on the cab or engine under spring tension, a bell crank lever with connections between said lever and arm G, a second bell crank at right angles to the first and a connection between the two, a sliding rod actuated by the second bell crank and connections from said rod to the braking and signaling devices, substantially as described.

2. In combination with projections on each side of a railway, an arm G on each side of the cab or engine projecting laterally therefrom, a central bell crank J, with levers H, extending therefrom to the arms G and con-

nections from said bell crank to the braking and signaling devices, substantially as described.

3. In combination, the arm G, the vertically movable slide *k* with connections to the arm G, a brake lever on the cab and a projection on the slide *k* adapted to operate the brake lever, substantially as described.

In witness whereof I have set my hand, at London, this 23d day of November, 1892, in presence of two witnesses.

RICHARD STEPHEN WILES.

In presence of—
ALBERT EDWARD ELLEN,
JAMES MILLER.