

(No Model.)

3 Sheets—Sheet 1.

R. D. PETERS.
RAILWAY BLOCK SIGNAL.

No. 494,077.

Patented Mar. 21, 1893.

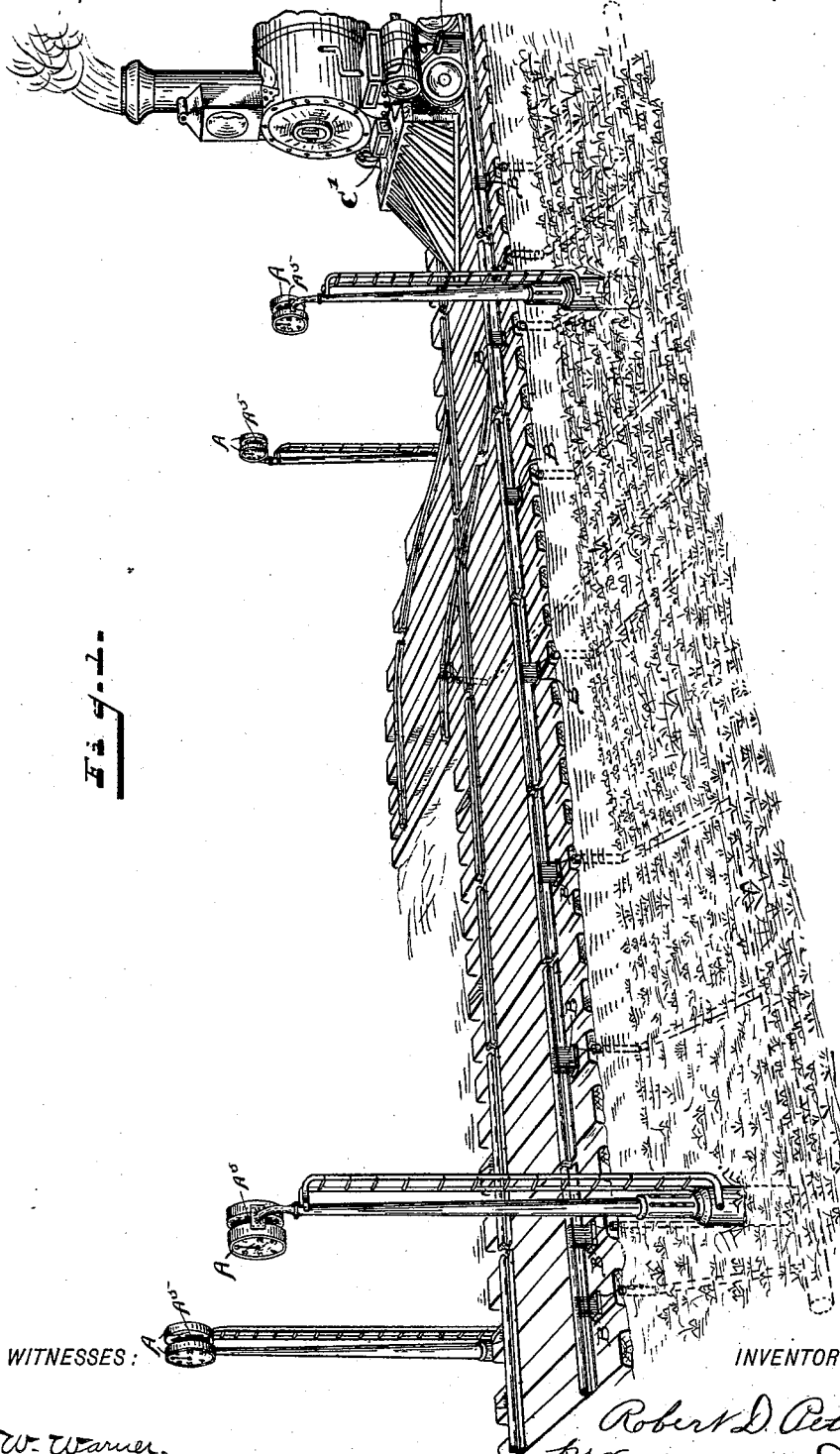


Fig. 1.

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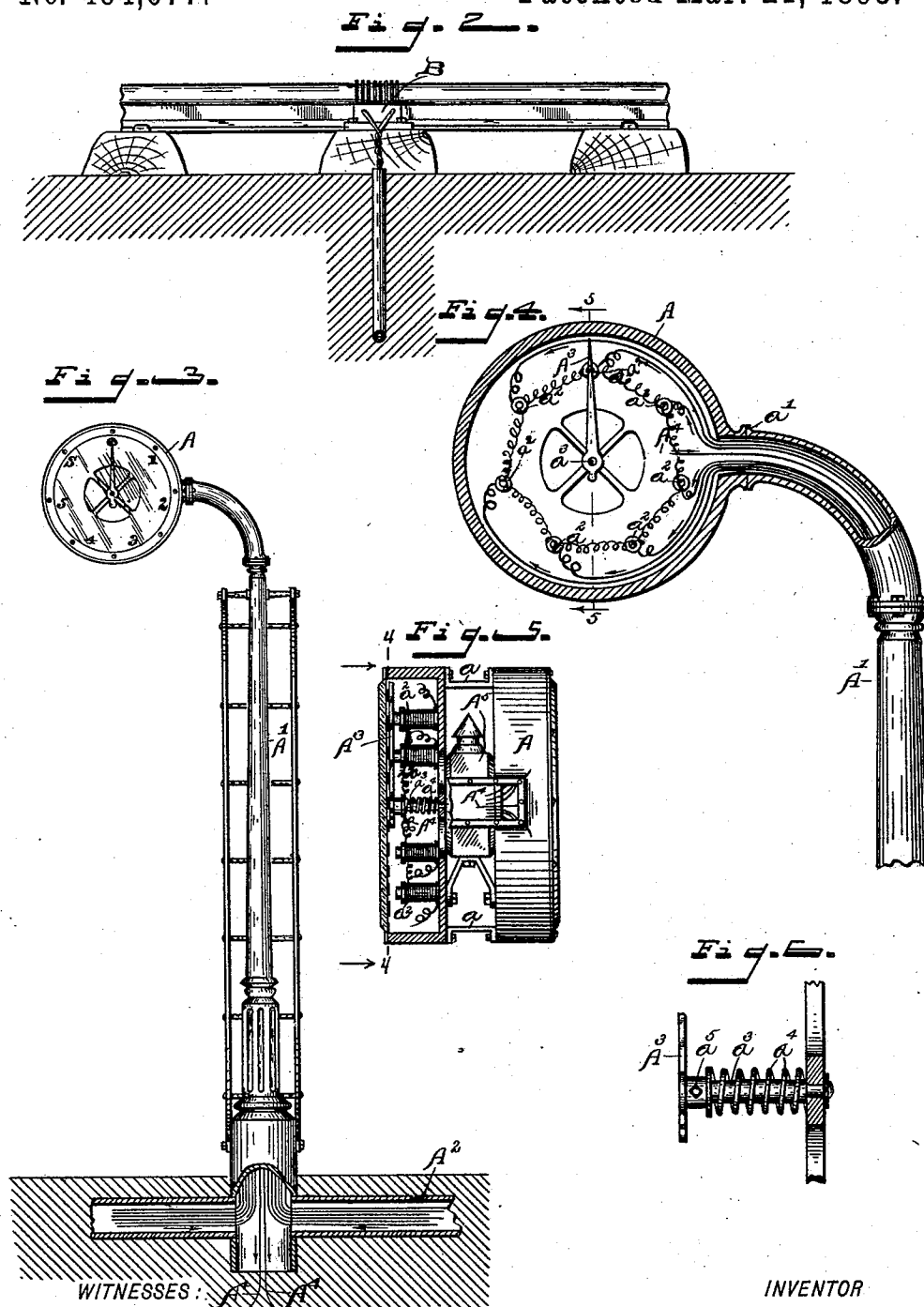
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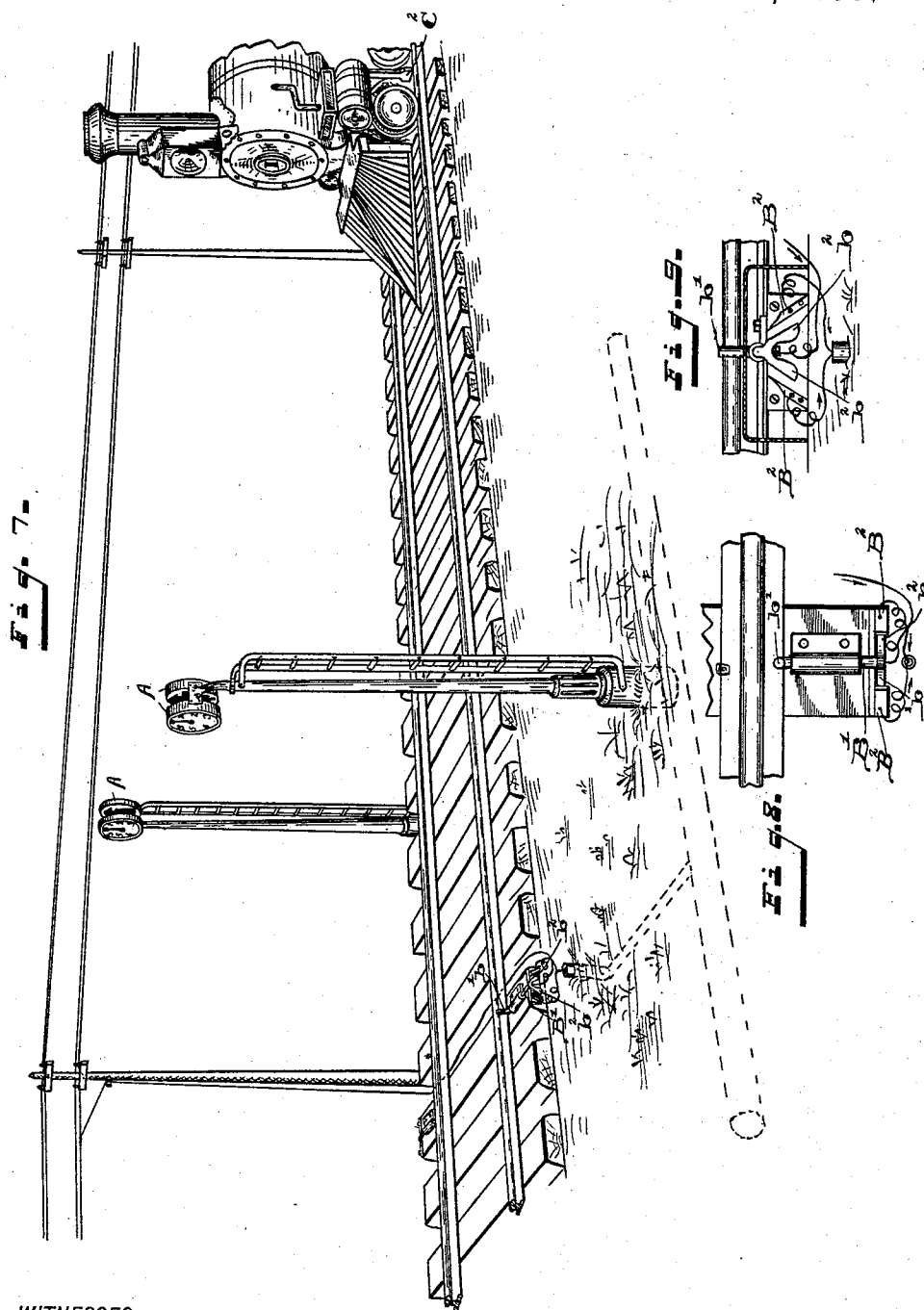
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UNITED STATES PATENT OFFICE.

ROBERT D. PETERS, OF WINAMAC, INDIANA, ASSIGNOR OF ONE-HALF TO
CHARLES L. WAIT, OF SAME PLACE.

RAILWAY BLOCK-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 494,077, dated March 21, 1893.

Application filed July 11, 1892. Serial No. 439,652. (No model.)

To all whom it may concern:

Be it known that I, ROBERT D. PETERS, a citizen of the United States, residing at Winamac, in the county of Pulaski and State of Indiana, have invented certain new and useful Improvements in Railway Block-Signals, of which the following is a specification.

The object of my said invention is to provide an improved arrangement of signaling devices, and means for operating the same, to be used in a railway block signal system, whereby the engineer of any train when entering a block may tell whether or not there is a train within said block, the direction in which it is going, and its location therein, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a view indicating a five mile block of railway provided with my improved signaling apparatus; Fig. 2 a detail view of a portion of the track showing the contact brush located alongside thereof; Fig. 3 a view in elevation of one of the indicators or signals; Fig. 4 a sectional view looking in the direction indicated by the arrows from the dotted line 4 4 in Fig. 5; Fig. 5 a view of the signal or indicator case, partly in edge elevation and partly in central section as seen when looking in the direction indicated by the arrows from the dotted line 5 5 in Fig. 4; Fig. 6 a detail sectional view showing the manner in which the indicator hand is mounted in said case, and Figs. 7, 8 and 9 views illustrating a modified arrangement.

In said drawings the portions marked A represent the indicator cases; B contact brushes located alongside the track, and C a brush secured to a portion of the locomotive frame on its side in position to strike said contact brushes B.

The indicator cases A are preferably circular in form, the front or dial of each being transparent having figures or indicator marks thereon to designate the position of the train in the block. The back of each is formed with a series of openings around its center. Said cases are arranged in pairs with their backs adjacent, with a lamp A⁵ between them,

opposite said central openings, for illuminating the interior and rendering the characters upon the faces or dials easily discernible. The two cases of each pair are secured together by connecting clips or braces *a* a suitable distance apart, and are formed with an opening upon one side around which is formed a flange by which said pair of cases is secured by means of screws or bolts to a corresponding flange *a'* on the end of the curved top of the supporting post A'. Said post A' is preferably a hollow metal post the lower end of which communicates with a conduit A² through which and said hollow post wires are laid from the contact brushes B to magnets *a*² in said indicator cases. Said magnets *a*² are secured to the back side of each indicator case, one magnet behind each figure or indicator mark upon the dial. A ground wire A⁴ is connected to one pole of each of said magnets, and runs down through the hollow post to the ground to complete the electric circuit through said magnets, and energize them, whereby the indicator hand is drawn to the proper magnet and indicator mark, as will be hereinafter more fully described. An indicator hand A³ is mounted within each case upon a central pinion *a*³. A spring *a*⁴ is interposed between the back of said case and each indicator hand, the tension of which may be varied by adjusting the hand on its pinion by means of a set screw *a*⁵. By this means said hand is held against its own gravity in whatever position it may be drawn or left.

The contact brushes B consist of metal plates having a number of upwardly extending springs or points, being secured alongside the track in position to be hit by the brush C upon the locomotive. Said brushes are located a mile distant one from the other, or that distance apart which it is desired the spaces of the block shall be. In Fig. 1 a five mile block is indicated, each mile being marked by one of said contact brushes. A side-track is also indicated, which is also provided with one of said contact brushes. The dial is divided into seven spaces marked with the numerals and characters "0" "1" "2" "3" "4" "5" and "S." One of the magnets *a*² is arranged directly behind each, and

the indicator hand is that distance from the back of the case which will enable it to pass the points of said magnets. The indicators are located on each side of the track, those upon one side being used to indicate trains going in one direction, and those on the other side to indicate trains going in the opposite direction. A wire is run from the contact brush B at the entrance to the block to the magnet behind the "1" on the dial facing the direction from which the train enters of that indicator case A which will be behind the moving train after the entrance to said block; and another wire is run from the same contact brush to the magnet behind the "1" on the dial of the oppositely disposed indicator case at the other end of the block. At the end of the first mile of the block is arranged another contact brush from which a wire is run to the magnet behind the "2" on said dials. At the end of the second mile another brush is located from which a wire is run to the magnet behind the "3" on said dials. At the end of the third mile a wire is run from the brush to the magnet behind the "4" on said dials. At the end of the fourth mile a wire is run from the brush to the magnet behind the figure "5" on said dials. As the train passes out of the block the brush C strikes a brush B located at the exit from which a wire is run to the magnet behind the "0" on said dials; and from the contact brush of the siding a wire is run to the "S" on said dials. Said wires are run from the track to the conduit A² through pipes, as indicated, and are run through said conduit into the indicator cases through the hollow posts A', each wire being connected to its proper magnet at the end opposite that to which the ground wire A⁴ is connected. In going in one direction the indicators on one side of the track are operated, and in going the other way those on the other side are used. In the case of railways having a multiplicity of tracks with trains running only one way on each track, only one case A will be needed on each post, as no signal in front of the train will be needed.

The contact brush C is or may be secured upon the locomotive or any other portion of the moving train in any desired manner in position to brush against the brushes B as the train passes over them. It is charged with an electric current from a battery or dynamo C' located in any convenient position on the locomotive or train, through a wire c.

The operation of my said invention is as follows: As the locomotive enters the block as shown in Fig. 1, the contact brush C will strike the contact brush B at the entrance to said block, and, through the wires connecting said brush with them, energizes the magnet behind the "1" of the rear dial on the post the train is passing and that behind the "1" on the front dial of the indicator on the post at the other end of the block, which draws the indicator hands to said magnets, completing

the circuit through the pinion and ground wire A⁴ to the ground. The hands then indicate to an engineer at each end of the block that a train has entered said block, and is on the first mile thereof. As the locomotive passes into the second mile over the next indicator brush B, a current is sent into the magnets behind "2" on said dials, energizing said magnets and drawing the indicator hands thereto, which completes the electric circuit through said hands and their pinions and the ground wires A⁴. As soon as the brush C passes, the current is, of course, broken, but the hand is held in this position by the friction caused by the tension of the spring a⁴ until the next magnet is energized by the contact of the brush C and the brush B at the end of the next mile, when said indicator hand (in each case before specified) is drawn by the mechanism to the next magnet, and so on. As the train runs over the brush B at the exit to the block, the magnets behind the "0's" on said dials are energized and the indicator hands drawn to said characters, which then indicate to an engineer or others, at each end, that the block is clear. The train running onto the siding energizes the magnets behind the "S," which draws the hands to said indicator marks, and indicates to the engineers that a train is upon the side-track. As trains going in opposite directions will use indicators on opposite sides of the track, not only is the position of a train within the block indicated, but also the direction in which it is going. An engineer approaching said block, and observing that a train is in said block going in the same direction with himself and a safe distance ahead of him may proceed cautiously without waiting for the forward train to pass out of the block; while if a train is coming toward him within said block he will know within a mile of how far the approaching train is from him, and take proper precautions to get out of the way, and avoid accidents. Thus an indicator is provided which gives information certainly and of such a character that much time may be saved and perfect safety yet be insured. As will be readily understood, the indicators may be located as preferred, and provided in the offices of the train dispatchers if desired, which enables said officers to watch the progress of their trains without trouble.

In Figs. 7, 8 and 9 I have shown a modified arrangement, whereby, in lieu of a battery upon the locomotive or train, the electric current is supplied by a wire strung alongside of the track, from a dynamo or battery suitably located along the line. In such an arrangement a wire is run to a rock-shaft B' mounted on top of one of the ties or other suitable support provided for the purpose having an upwardly extending trip-arm b' in position to be struck and operated by a downwardly extending arm C² on the side of the locomotive. On the outer end of said rock-shaft two diverging weighted fingers b² are provided, and is

secured in suitable position and connected by wires to the proper magnets in the indicator cases as in the other arrangements. Spring contact points b^3 are secured to said plate on each side of said fingers b^2 , with one of which one of said fingers b^2 contacts when the trip-arm b' is hit by the arm C^2 on the engine. Said fingers b^2 being weighted normally maintain the shaft in proper position to present the trip-arm b' to said arm C^2 , and they are insulated from the plate proper by covering the adjacent face of said plate with insulating material, as indicated in Fig. 9. As will be readily understood, the operation in so far as the signals are concerned is the same as that before described; the only difference consisting in the different manner of establishing a circuit for the electric current. Instead of the weighted fingers, springs may be used to hold the rock-shaft in proper position, as will be readily understood.

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

1. A signaling device for a railway block signal system consisting of indicator cases mounted upon supports set at desired intervals alongside the track, each case having a dial provided with suitable indicator marks thereon, and an indicator hand mounted therein, a magnet arranged behind each of said indicator marks, a wire running from each magnet to the proper point alongside the track and connected with a suitable contact device, and a suitable device located on the locomotive or train for throwing said contact device into an electric circuit, substantially as set forth.

2. In a railway block signal system the combination of the indicator consisting of suitable casings arranged in pairs supported on suitable posts at the ends of each block the cases of each pair being arranged with their backs adjacent and having indicator marks upon their faces, an indicator hand mounted within each case, a magnet mounted behind each indicator mark, contact devices located alongside the track at the desired intervals, a wire running from each of said contact devices to a magnet behind the corresponding indicator marks of the oppositely disposed indicators at the ends of the block, and means upon the locomotive or train for establishing an electric circuit through said magnets, substantially as set forth.

3. In a railway block signal system the combination of the indicators consisting of the

casing having faces with suitable indicator marks, the indicator hand, and the magnets behind each mark, and means for energizing said magnets consisting of a battery suitably mounted upon the locomotive or train, a contact arm or brush connected therewith and extending down to a position alongside the track, contact brushes located alongside the track in the path of said arm or brush, and wires running from said contact brushes to said magnets, substantially as set forth.

4. In a railway block signal system the combination of the indicator consisting of the casing having a transparent face or dial, indicator marks thereon, an indicator hand in said casing mounted upon a suitable pinion, a tension spring or device on said pinion, a magnet mounted behind each indicator mark, a lamp mounted behind the central opening in the back side of said casing, contact brushes located at the desired intervals throughout the block alongside the track, wires running from said magnets to said contact brushes, a battery on the locomotive or train, a contact brush also on said locomotive or train in position to strike the contact brushes alongside the track, and a wire connecting said brush with said battery, all substantially as set forth.

5. In a railway block signal system, the combination of indicator cases located at suitable or desired intervals alongside the road and on opposite sides thereof, an indicator hand in each case, a magnet arranged behind each indicator mark on the dial to draw said indicator hand to its mark on the dial of said case when thrown into an electric circuit, and a suitable device located on the train for closing said circuit, trains going in opposite directions being equipped to operate the indicators on opposite sides of the roads, substantially as set forth.

6. An indicator for indicating the position of a train on a railway system consisting of a casing, indicator marks, an indicator hand therein, a magnet at each indicator mark, each magnet being electrically connected to a device alongside the track which a passing train will operate to throw said magnet into an electrical circuit, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 1st day of July, A. D. 1892.

ROBERT D. PETERS. [L. s.]

Witnesses:

E. W. BRADFORD,
J. A. WALSH.