D. ROUSSEAU.

Electric Railway-Signals.

No. 166,557. Patented Aug. 10, 1875.

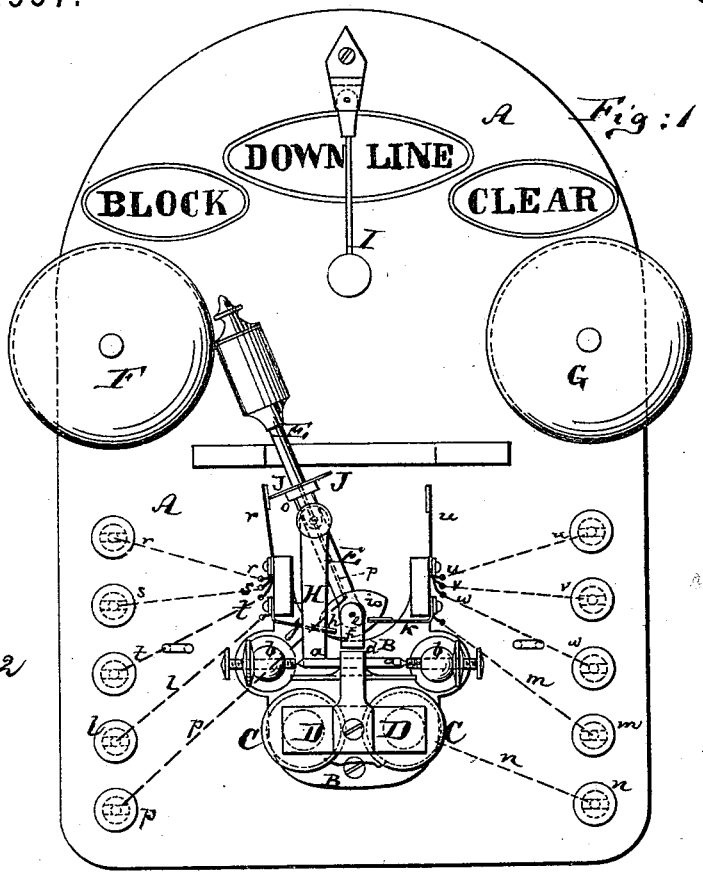

Fig: 1

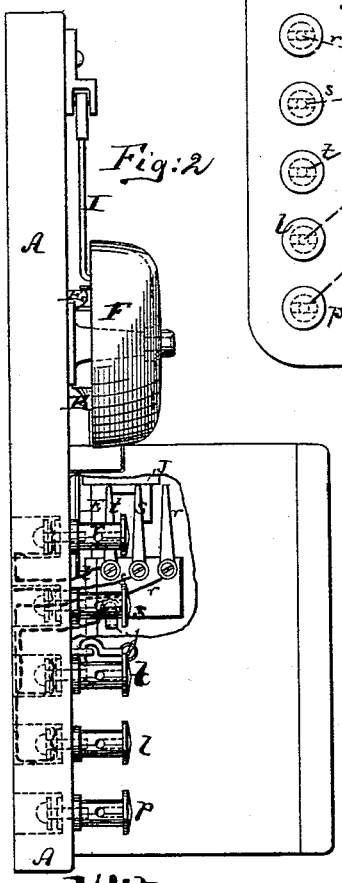

Fig: 2

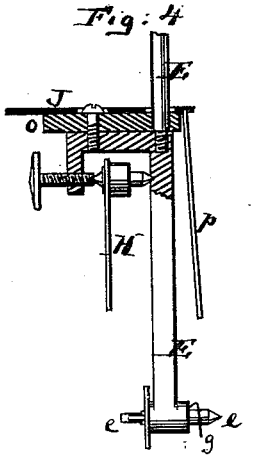

Fig: 4

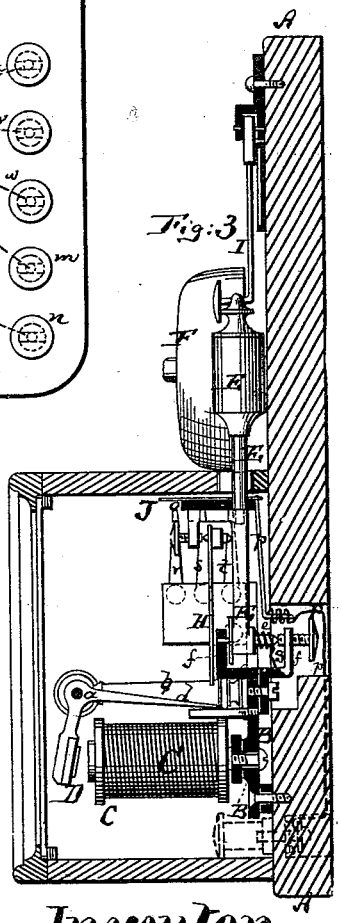

Fig: 3

Witnesses:

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Inventor

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by his attorney

A. V. Briesen

UNITED STATES PATENT OFFICE.

DAVID ROUSSEAU, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM F. SMITH AND SAMUEL SAMUELS, OF SAME PLACE.

IMPROVEMENT IN ELECTRIC RAILWAY-SIGNALS.

Specification forming part of Letters Patent No. **166,557**, dated August 10, 1875; application filed July 21, 1875.

CASE A.

To all whom it may concern:

Be it known that I, DAVID ROUSSEAU, of the city of New York, county and State of New York, have invented an Improved Electric Station-Signal, of which the following is a specification:

The object of this invention is to produce an instrument which will enable the superintendent at a railroad station or depot to properly control the movement of trains without being obliged to leave his station or to keep each train bodily in view. At stations where large numbers of trains enter and leave, a control of the movements of such trains within a certain distance is absolutely necessary, in order to prevent collisions and delay, aside from the desirability of keeping a record of the time kept by each train, and of its position at any one time.

My invention is based upon the proper utilization of the circuit-closing devices already applied to first-class railroads for automatically setting the signals by which the engineer of each train regulates his movements, but is also applicable to roads that do not have such or other electric signals.

The principal feature of my invention is the application of a vibrating index-clapper to and between two gongs, so that said clapper will by its position indicate the condition of a given section of railroad-track, while it will, by contact with one of the gongs, give notice of every change of its position, and consequent change of the condition of the track.

Another important feature of my present invention has reference to the mechanism for imparting motion to the index-clapper by the armature of an electro-magnet, which is composed of a lever suspended from the index-clapper over an arm of the armature, as hereinafter more fully described.

The third prominent feature of this invention consists in the application of projections or wings to the index-clapper, which said wings serve to close contact with the wires through which the currents that cause the clapper to move are passed. Thus the clapper, after each motion, makes contact with a wire, through which its position will be reversed as soon as a current passes through such wire. In other words, the body of the index-clapper is made part of the conductor of each current that affects the position of the clapper.

My invention consists, also, in other details of invention, that will be hereinafter more fully set forth.

In the accompanying drawing, Figure 1 is a face view of my improved station-signal. Fig. 2 is a side view of the same. Fig. 3 is a vertical cross-section of the same, and Fig. 4 a detail cross-section of part of the index-clapper and its attachments.

Similar letters of reference indicate corresponding parts in all the figures.

The letter A represents a stationary wall or frame, on which the improved instrument is supported. To this frame or wall is firmly secured a plate, B, to which an electro-magnet, C, is secured. D is the armature of the electro-magnet, its lever being pivoted by projecting pins *a a*, or otherwise, in posts *b b*, that project from the plate B or frame A. The armature-lever D has a projecting horizontal arm, *d*, as shown. E is a metallic rod, pivoted at or near its lower ends by a horizontal pivot, *e*, in ears *f f*, that project from the plate B or frame A. I prefer to hang the rod E by metallic connection in the projections of the metallic plate B, with which one end of the wire of the electro-magnet C communicates, or else I connect the rod E by a wire, *g*, with the plate B, or with the wire of the electro-magnet. The upper end of the rod E is weighted, as is clearly shown in Figs. 1 and 3, so that when it is brought out of a vertical position it will fall against one of two gongs, F G, or other sounders or audible devices, that are respectively secured at opposite sides of the rod E to the frame A. The rod E is what I have termed the "index-clapper," as its weighted upper end constitutes the clapper of the gongs F G, while it also serves as a visible index, to show which position it has last assumed. *h* and *i* are two metallic wings or projections on the index-clapper. *j* and *k* are two metallic springs or

rods, so secured to the stationary part of the apparatus that the clapper will, with its wings or pins *h i*, come in contact with one of said springs when it is swung to one side, and with the other when swung to the other side. Thus, in Fig. 1, the pin or projection *h* is represented as being in contact with the spring *j*, the clapper being in contact with or near the gong F. When *h* and *j* are in contact *i* and *k* are apart, and vice versa, invariably.

Now, before proceeding further, I wish to have it understood that by the term "metal" or "metallic" in this specification I mean a substance which is a good conductor of electricity; any other material having the like property will answer the same purpose. Instead of using the springs *j k* and wings or pins *h i*, the required metallic contact may be obtained by bodily contact of the index-clapper with the gongs, or by other equivalent means. Yet I prefer the system of springs and pins herein described, because I thereby secure more reliable action.

H is a lever, pivoted at or near its upper end to the index-clapper E, as shown in the drawing, its lower end being suspended over the free end of the arm *d* of the armature-lever.

The use and operation of the apparatus, as thus far described are as follows: In the station-house of the superintendent of a depot, or of any other proper officer, are secured as many instruments of the kind described as there are tracks to be watched or controlled. Each track is supposed to have a circuit-closer at each terminus of the portion to be watched, the wire *l* leading from one of these circuit-closers to the spring *j*, and the wire *m* from the other circuit-closer to the spring *k*. The wire *n* leads from the electro-magnet C to the ground; or, if there is to be but one battery, it may connect with the electro-magnet C, while the wires *l m* lead to the respective circuit-closers, both of which connect with the ground. Now, as long as the portion of track to be watched is clear—that is, as long as the same is free for a train to enter—and while the white signal is displayed, if automatic signals are used, the clapper rests on, or is near, one of the gongs, say the gong G, which may be marked "clear," as shown, while the other gong may be marked "blocked;" or marks or words of like import may be used for greater ease of ascertaining the true condition of the track. Pointing thus to "clear," the index-clapper causes the electro-magnet to be in metallic connection, through the pin *i*, with the spring *k* and wire *m*, the wire *m* leading to that end of the portion of track in question where an approaching train must enter such portion. If a train approaches and enters upon the portion of track under control, the circuit-closer is closed at the end of the said portion of the track by suitable means, either by the weight of the train or otherwise, and a current immediately created through the wire *m*, spring *k*, pin *i*, electro-magnet C, and wire *n*. Thereby the electro-magnet is caused to attract its armature, and to vibrate the lever or arm *d* and swing it upward. The lever H, while the index-clapper is near the gong G, is suspended in a vertical position at one side of the pivot *e* of the clapper, and its lower end is, by the motion of the arm *d*, struck by said arm, which tends to raise it. But, since the lever H is pivoted to the index-clapper, the upward motion imparted to it by the arm *d* is transmitted to the pivot of said lever H on the clapper, and said pivot consequently raised—*i. e.*, swung with the body of the clapper vertically, or nearly so, over the pivot *e* of the clapper. Its inertia carries the weighted clapper beyond the vertical line, and causes it to strike the gong F. The index-clapper thus attracts the attention of the station-master or superintendent, by the sound of the gong F, to the fact that the track is blocked, and points also to such gong, which may be marked as already described, while the track remains blocked.

By the motion of the index-clapper last described, the connection between *i* and *k* is interrupted, but connection between the pin *h* and spring *j* established, and the lever H carried to that side of the pivot *e* at which the spring *j* is located. The position of parts is now as indicated in Fig. 1.

When the train leaves the portion of the track which is under control, it closes the circuit on the wire *l*, and causes a current to pass through the electro-magnet C, whereby the armature will be again attracted, and the lever or arm *d* vibrated, as above described. But the effect of the vibration of the arm *d* will now be to throw the index clapper over to the other side against the gong G, and to re-establish connection between the parts *i* and *k*, separating that between the parts *h* and *j*.

Thus the instrument always shows whether a given portion of railroad-track is clear or occupied, and sounds, moreover, an alarm whenever occupation of such portion of the track commences, and when it ceases.

When there are many of these instruments in close proximity an annunciator, I, may be suspended in the way of the vibrating index-clapper, said annunciator being, by preference, in form of a light pendulum, that will oscillate for a while after the index-clapper has struck a gong. The oscillating annunciator will then show which of a series of instruments did operate.

If it is desired to utilize the index-clapper for transmitting the signals received to other stations or apparatus of suitable kind, it is only necessary to attach a metallic plate, J, to said index-clapper, but insulate it therefrom by a plate, *o*, or otherwise, so that it will not interfere with any of the currents which have already been described. This plate J may, by a wire, *p*, be connected with a local battery, and close circuit with as many prongs or spring-conductors *r s t* and *u v w* as there are signals to be transmitted, said spring conduct-

ors or prongs being attached to the frame A or plate B, but insulated from the latter, as shown, in positions that will enable the plate to connect with the springs *u*, *v*, and *w* whenever the clapper strikes the gong G, and with the springs *r s t* whenever the clapper strikes the gong F. The circuits thus closed may operate suitable signals at other stations or places. The springs *r s t u v w*, &c., connect, of course, with suitable conductors, as indicated by dotted lines in Fig. 1.

I claim as my invention—

1. The combined index and clapper E, arranged between two gongs or sounders, F and G, substantially as and for the purpose herein shown and described.

2. The lever H, pivoted to the index-clapper E, and combined with the armature-lever, to transmit the motion of the armature to the index-clapper, substantially as herein shown and described.

3. The pins or projections *h* and *i*, applied to the vibrating index-clapper E, and combined with the springs *j* and *k*, substantially as herein shown and described.

4. The annunciator I, combined with the vibrating index-clapper E, and with the gongs or sounders F G, substantially as herein shown and described.

5. In combination with the vibrating index-clapper E, the insulated plate J and conductor prongs or springs *r s u v*, &c., substantially as herein shown and described.

DAVID ROUSSEAU.

Witnesses:
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