D. ROUSSEAU.

Electric Railway-Signals.

No. 166,559. Patented Aug. 10, 1875.

Fig: 1

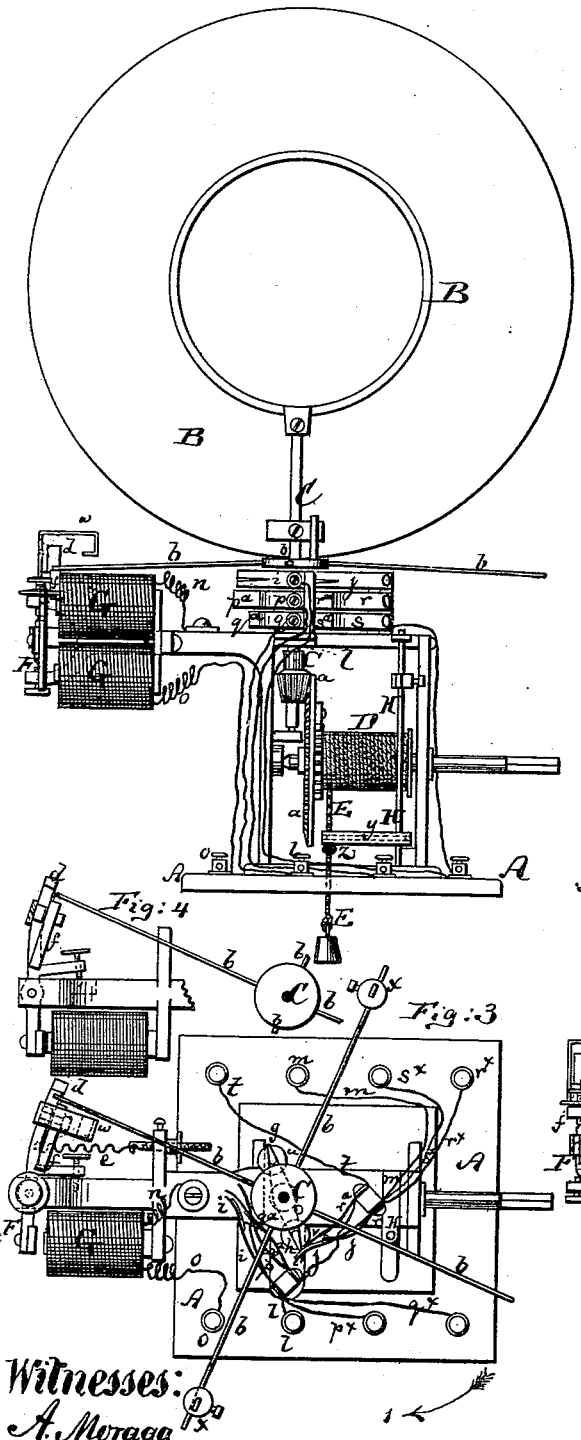

Fig: 2.

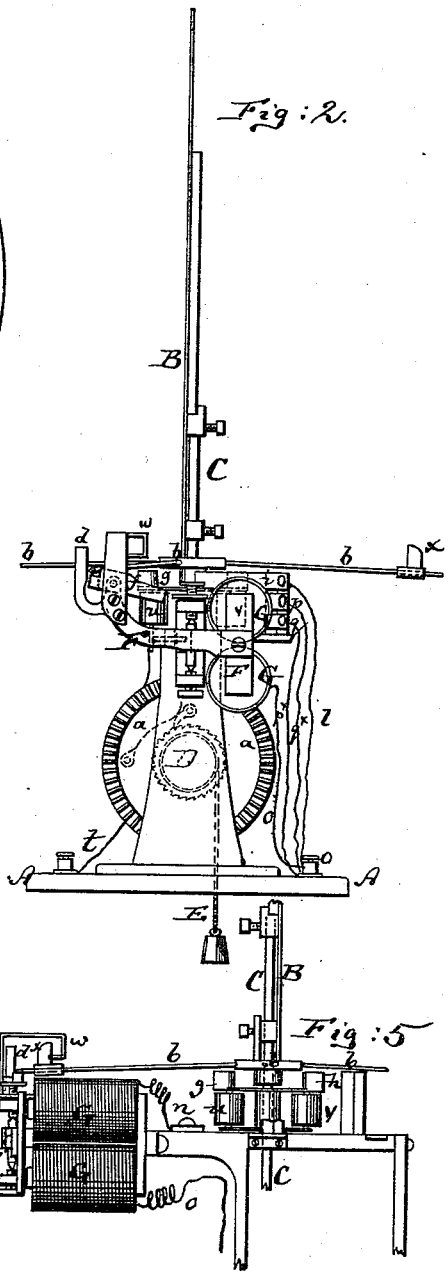

Fig: 4

Fig: 3

Fig: 5

Witnesses:
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Inventor:
David Rousseau
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. **166,559**, dated August 10, 1875; application filed July 21, 1875.

CASE C.

To all whom it may concern:

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

This invention relates to an improved signal-operating mechanism, which is based upon the apparatus described in Letters Patent No. 141,387, granted to me July 29, 1873, the principal features of my present invention referring to means for locking the rotary signal at each motion, and to means particularly for causing it to show danger whenever any part of the apparatus is out of order. The invention also relates to other features of improvement, as will be specially pointed out in the subsequent description.

In the accompanying drawing, Figure 1 is a face view of my improved electric signal; Fig. 2, a side view thereof; Fig. 3, a top view of the same; Fig. 4, a detail top view of the armature attachment; and Fig. 5, a detail side view, showing the mechanism for locking the signal at the danger position when any part of the apparatus is out of order.

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

The letter A in the drawing represents the stationary frame on which the signal B is supported, and also all the mechanism for operating said signal. The signal B is mounted upon a vertical shaft, C, which has its bearings in the frame A, and which, by means of beveled gear-wheels *a*, or otherwise, is in connection with a drum, D, upon which a weighted cord or rope, E, is wound, so that such cord or an equivalent spring will have the tendency, when wound up, to rotate the signal on and with its vertical shaft. This rotation is prevented from being continuous by one of four, more or less, radially-projecting arms *b* of the shaft C, striking a lug, *d*, that projects from the end of an armature lever, F. The armature of said lever is, by a spring, *e*, held away from its electro-magnet G in such way as to bring the lug *d* in the way of the arms *b* of the shaft C, substantially as indicated in Fig. 3. The shaft C, when under the influence of the weighted cord, rotates in the direction of the arrow 1, shown in Fig. 3. To the armature-lever is also pivoted a trigger, *f*, which yields to the arm *b* on its way to the lug *d*, but which, when the arm strikes said lug, swings on its pivot, to elevate the end nearest such arm *b*, which prevents the arm *b* from being turned backward. Thus, the trigger constitutes a very reliable pawl or detent, to prevent all backward motion of the shaft C and of the signal.

As thus far described, the apparatus is substantially the same as that described in my former patent above referred to, excepting the addition of the trigger *f*, which is the first feature of my present invention. *g h* are two arms that project from the shaft C, standing, by preference, diametrically opposite each other, as indicated in Fig. 3. These arms come in contact alternately with metal springs *i j*, that are mounted upon the frame A, and connected by wires *l m*, respectively, with the circuit-closing instruments from which the signal is to be affected. The shaft C, carrying the arms *g h*, is in metallic connection by wire *n*, or otherwise, with the electro-magnet G, which, in turn, communicates by wire *o* with the ground. Or, if but one battery is to be used for the two circuit-closers, by which the instrument is to be operated, such battery may connect by the wire *o* with the electro-magnet, in which case the wires *l m* will lead from the springs *i j* to the respective circuit-closers, and thence to the ground.

As far as now described the instrument will operate whenever that one of the circuit-closers which connects metallically with the shaft C is closed, while any action upon that circuit-closer, which is not metallically connected with the shaft C for the time being, will not affect the position of the signal. If, for example, the circuit-closer which connects with the spring *i* should be in any way affected by a train, or otherwise, while such spring is not in contact with one of the metal arms on the shaft C, the signal will of course remain unaffected by such action; but if the other circuit-closer which connects with the spring *j* is properly affected by a train passing

over it while such spring, as in Fig. 3, is in contact with the arm *h*, a current will be created through the electro-magnet, and the armature thereby attracted, and the lug *d* thereby carried out of the way of the arm *b* that rested against it, and the shaft thereby liberated, as in Fig. 4, to revolve in the direction of the arrow 1; but immediately upon commencing to rotate the arm *h* leaves the spring *j*, and the current is therefore interrupted, and the magnetism of the electro-magnet terminated, and the armature-lever brought under the influence of the spring *e*, which carries the lug *d* into the way again of the next succeeding arm *b* to lock the signal in the new position. Therefore, if the signal first showed white, its next position will show red, and vice versa. The lug *h*, after having left contact with the spring *j*, arrives in contact with the spring *i*, and will therefore serve as a conductor for the current that is created at the next instrument with which the spring *i* connects, so as to aid in moving the signal again as soon as the instrument connected with the spring *i* is affected by a train, or otherwise, in the requisite manner.

To the supporting-frame are or may also be secured a series of metal tongues, *p q r s*, which, though insulated from the frame A, are, by proper conductors $p^{\times}$ $q^{\times}$ $r^{\times}$ $s^{\times}$, joined to instruments which are also to be operated by the action of the rotating signal B. A wire, *t*, extends from a local battery into connection with metallic springs p^{a} q^{a} r^{a} s^{b}, that are placed, respectively, opposite to, but not in contact with, the tongues *p q r s*. The springs p^{a} q^{a} are about beneath or above the spring *i*, as shown in Fig. 1, and the springs r^{a} s^{a} are about beneath or above the spring *j*, as shown in the same figure. The shaft C carries beneath or above the arm *g* a projecting friction-roller, *u*, and beneath or above the arm *h* a projecting friction-roller, *v*. Whenever the arm *h* reaches contact with the spring *j* the roller *v* also comes in contact with the springs r^{a} s^{a}, and presses said springs against the tongues *r s*, thereby closing circuits through said tongues and their respective conductors, and causing distant signals to be operated or alarms to be sounded, as may be required. So, also, when the arm *h* comes in contact with the spring *i*, its roller *v* presses the springs p^{a} q^{a} against the tongues *p q*, thereby closing the circuit at those places, causing their instruments to show that the signal is in a certain position, the same action being also obtained from the friction-roller *u*, which is below or above the arm *g*.

In practice, I prefer to use two such instruments at the ends of a piece of track which is to be controlled or protected by the same, one instrument at the commencement of the track and the other at the end of the same, both instruments to be so adjusted with reference to each other that when the first shows white—that is, shows its section of the track to be clear—the second will show red—that is, show the section of the track to be blocked—yet the first instrument, by electric connection with the second, causes the second signal to be set white as soon as the train reaches the first, and as the train reaches the second instrument it will reset the same at red, and thereby, by connection of the two instruments, cause the first to be reset at white.

If by any chance the second instrument should be out of order, the first will remain red, to caution an approaching train; and if, from any cause, the two circuit-closers of both instruments should be accidentally closed, there would be danger that the signal of the first instrument would revolve continuously, continuous circuit being established as one of its arms reaches first the spring *j*, then the spring *i*, the other then reaching *j*, &c. To prevent this I have attached a hook-shaped projection, *w*, to the armature-lever F, and a projecting stop, *x*, to each of those two arms *b* by which the instrument is locked in danger. The relative position of the stop *x* and hook *w* is such that, when the signal revolves and the armature should remain attracted to the electro-magnet, the first arm *b*, which carries the stop, will, as it arrives over said armature, cause its stop *x* to strike the point of the hook *w*, as in Fig. 5, and will then and thereby arrest the arm *b* and the further rotation of the signal, locking the latter at the position of danger or red; and if, thereupon, the armature is withdrawn from the electro-magnet, the hook *w* will clear the stop *x*, and the arm *b* will be carried against the stop or lug *d*, the same as it would originally have been brought against such stop had the armature been properly withdrawn originally from the electro-magnet.

Instead of the special mechanism which I have described in my aforementioned Letters Patent for locking the lamp-guard, so that the said guard will not be opened without first operating the signal-operating clock-work, I have devised a simpler mechanism in form of a slide, H, which has a slotted arm, *y*, through which the weighted cord E passes. A knot, *z*, is formed on said cord E below the arm *y*. In winding up the drum D the knot *z* is finally brought against the arm *y* and raises the same, and with it the slide H, said slide being, by suitable means, connected with a lever that locks the lamp-guard, unlocking it when the slide is raised, as aforesaid.

The whole instrument, as represented in the drawing, excepting the signal, is inclosed in a case, which is held locked by the lever locking the lamp-guard thereto, and the case can, therefore, not be opened, nor the lamp-guard removed, unless the rope is first completely wound up, to bring its knot against the slide H, and I therefore insure the daily winding up of the clock-work, and avoid danger from neglect.

I claim as my invention—

1. The trigger *f*, pivoted to the armature-lever F, and combined with the lug *d*, that

projects from said armature-lever, substantially as and for the purposes shown and described.

2. The projecting hook *w*, attached to the armature-lever F, in combination with the projecting stop *x* on the arm *b* of the signal, substantially as and for the purpose specified.

3. The friction-rollers *u v*, combined with the projecting arms *g h* of the signal-shaft, and with the springs p^a q^a r^a s^a, &c., substantially as and for the purpose described.

4. The slide H, carrying the slotted arm *y*, and combined with the rope E, which has the knot *z*, for the purpose of raising said slide, as specified.

The above description of my invention signed by me this 15th day of July, 1875.

DAVID ROUSSEAU.

Witnesses:
A. V. BRIESEN,
E. C. WEBB.