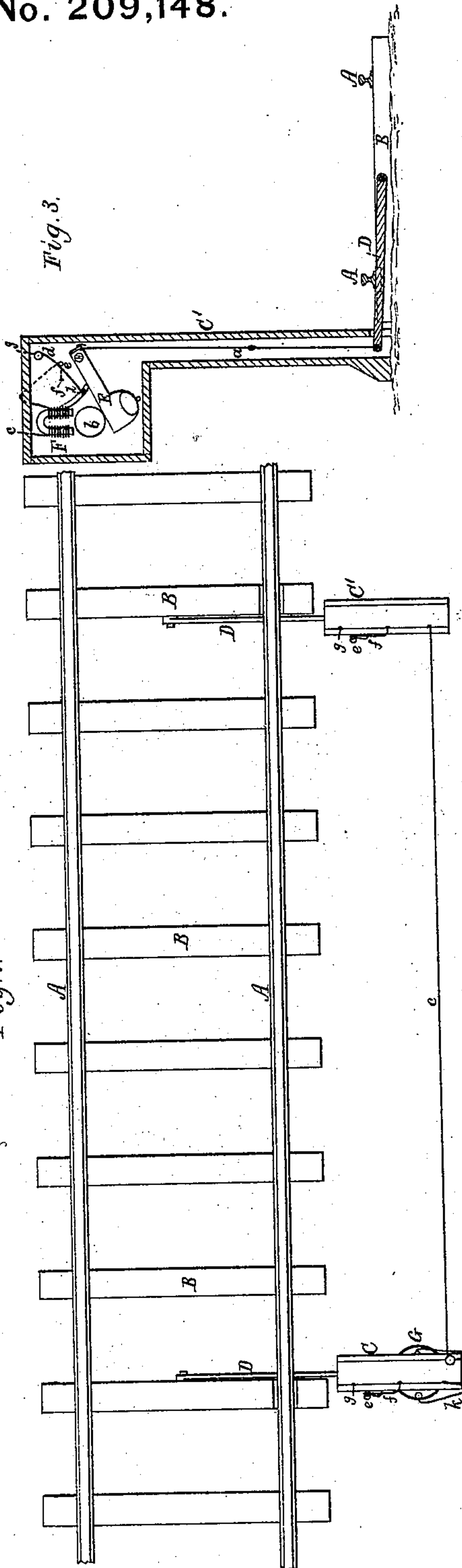


C. D. TISDALE.
Electric Railroad Signals.

No. 209,148.

Patented Oct. 22, 1878.

Fig. 1.



Witnesses
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John R. Knowlton

Fig. 4.

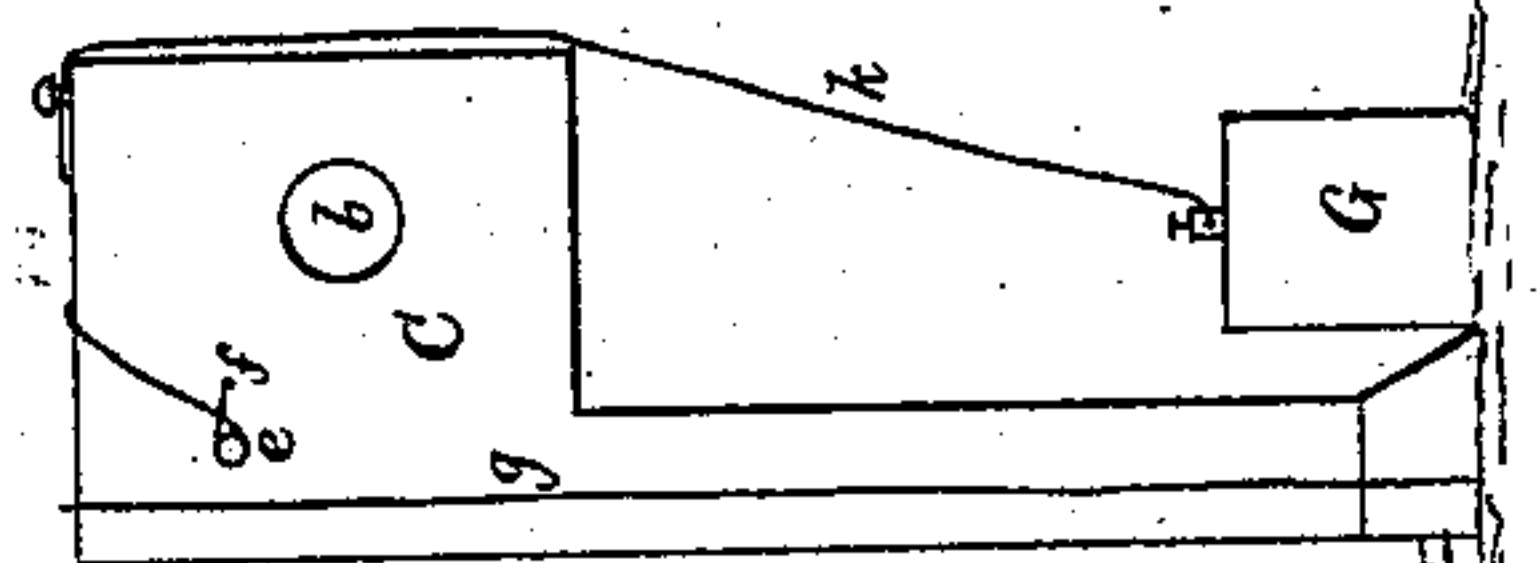
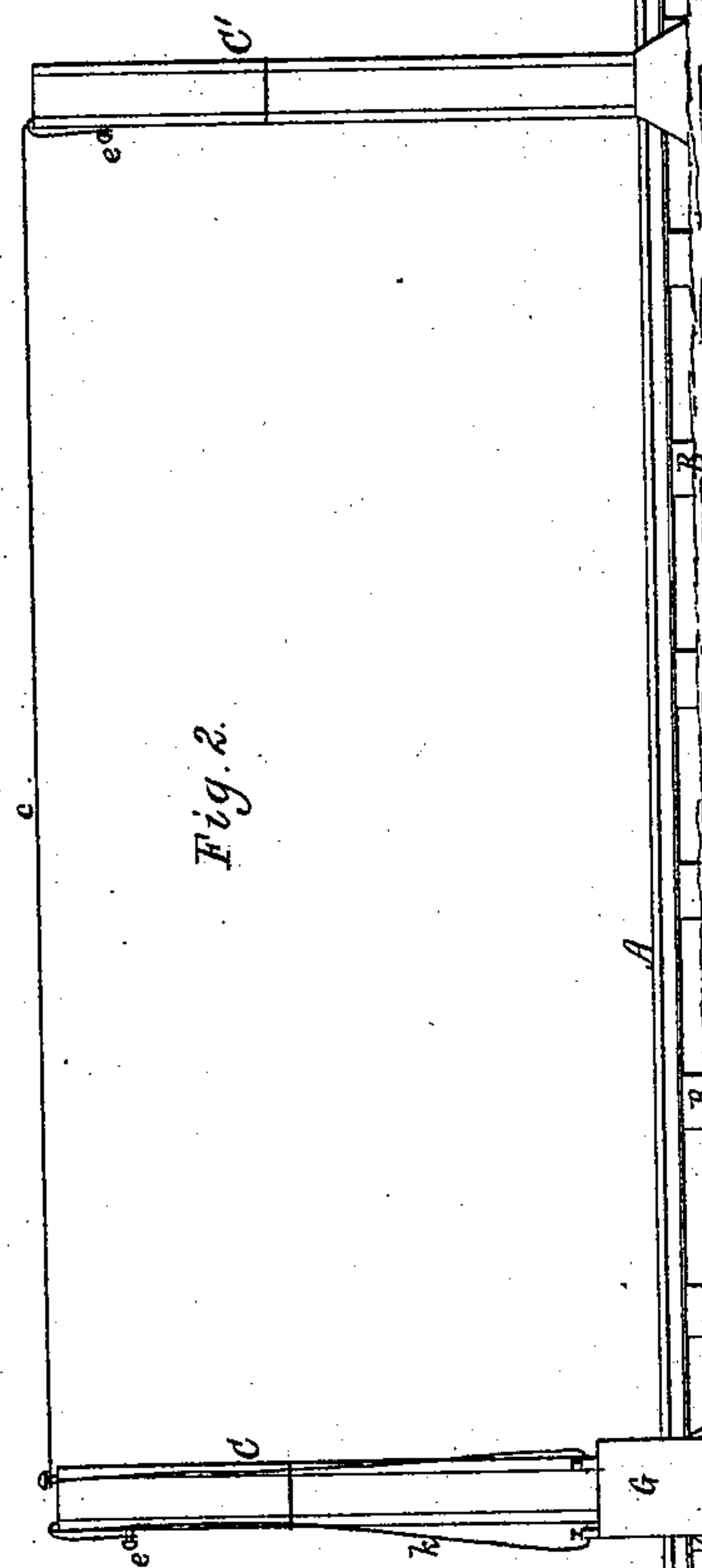


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES D. TISDALE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC RAILROAD-SIGNALS.

Specification forming part of Letters Patent No. **209,148**, dated October 22, 1878; application filed May 27, 1878.

To all whom it may concern:

Be it known that I, CHARLES D. TISDALE, of Boston, of the county of Suffolk and State of Massachusetts, have invented a new and useful Railway-Signal Apparatus; and do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, and Fig. 2 a front elevation, of a railway with such apparatus applied to it. Fig. 3 is a transverse section taken through one of the signal posts or standards, to be hereinafter described, and showing the devices applied to the interior chamber of such standard. Fig. 4 is a side view of the standard.

The object of my invention is to keep any two trains at a proper or safety distance apart while on a railway, or while running in the same direction thereon, such being in order to prevent collision of such trains, especially when one may be at rest on the track and the other may be approaching the place or station of rest.

With my invention, a train, in advancing toward or passing any one of the standards, is signalled as to whether a train in advance may have passed beyond the next post or standard, which may be supposed to be a mile or some other determined distance from the part at which the signal is made. In order to prevent collisions of trains, it is now the rule of various railways to maintain two trains, while running in the same direction, at a distance of at least a mile apart.

In the drawings, A A denote the rails, and B B B, &c., the cross-ties, of a railway-track, C and C' being two chambered posts or standards erected close to the track and at a suitable distance apart, which distance would usually be one mile. In carrying out my invention, the railway track is to be provided with a series of such posts arranged at proper distances asunder throughout the line.

Each post has extending into it, and underneath and across the next adjacent rail, a lever, D, pivoted at or near its inner end to one of the ties B, or to some other suitable device. The rail where crossing the lever is to be free to spring down or be depressed by the car-wheels while passing along it, such being in order to

force the rail down against and depress the lever under it. At its inner end the lever, by means of a chain or series of rods, *a*, is connected with the shorter arm of an iron signal-lever, E, arranged in the upper part of the standard, as shown, and formed so as, when in a horizontal position, to serve as an armature to the electro-magnet over it, and cover a circular opening, *b*, in the standard, in which opening there may be a pane of colored glass. Directly over the opening is the said electro-magnet F, whose circuit-wire *c* extends upward and out of the post, and thence to the next post, and to one pole of a galvanic battery, G.

The circuit-wire, after passing around the body of the magnet, terminates at a short distance therefrom, and extends, as shown at *f*, over a metallic spring or elastic switch, *d*, resting against a metallic stud, *e*, and arranged over the signal-lever in manner as represented. Furthermore, the circuit-wire, in its passage from the magnet, is carried around and in contact with the metallic shank of the stud *e*, and from thence into the post and projects over the switch.

In rising, the longer arm of the signal-lever forces the spring or elastic switch *d* upward off its rest or stud *e*, and against the part *f* of the circuit-wire. From the upper end of the switch *d* a wire, *g*, is led to and into the ground, or to a metallic plate arranged therein.

Each of the posts is to be provided with a signal opening and lever, an electro-magnet, a switch, stud, circuit-wires, and track-lever, arranged and applied as described, except that the post next the battery should have its magnet-current wire arranged to lead from the magnet to the other pole of the battery than that hereinbefore mentioned, such wire being represented at *k*. The wire from the switch of each standard is led to the ground, or a metallic plate embedded therein. There may be a hole or opening in each standard opposite to and like the signal-opening, in order for light to impinge on the back of the glass pane when the signal-lever may be down.

The operation of the apparatus may be thus described: A train, in passing the first post, or that next the battery, and going toward the second post, will depress the track-rail and force downward the track-lever, whereby the

signal-lever will be moved toward and up to the electro-magnet in the post. In rising upward the signal-lever will meet the switch (on whose end or part to bear on the lever there should be an electric insulator, *l*) and force it against the circuit-terminus *f*, and thereby close the circuit and cause the magnet to draw the armature signal-lever up to it and close or cover the signal-opening. In consequence of the switch of the second post being in contact with its stud *e*, the switch becomes part of the circuit. The train, in passing the second post, will depress the track-lever thereof, and thereby cause the signal-lever of such post to be moved upward toward the electro-magnet over it. In thus moving upward the said signal-lever will force the switch over it off its rest-stud, and, as a consequence, the circuit will be broken until the switch may meet the terminus *f* over it, when the circuit will be again closed, and the magnet will attract and hold up the signal-lever, so as to cause the signal-pane opening to be covered. On the circuit being thus broken, the signal-lever of the first post will drop away from its magnet, so as to pass below the signal opening and pane of its post.

From the above it will be seen that the train, in passing each post, effects, through the apparatus, the elevation of the signal-lever of that post and the depression of the signal-lever of the next preceding post. Consequently a train, in approaching each post, will be signaled

whether a train in advance has passed the next post, for if it has not the signal-lever of the last-named post will be up and covering the glass pane, so as to prevent the passage of light through it.

My invention differs essentially from that shown and described in the British Patent No. 747, for the year 1858, which has no levers extending underneath and to be moved by the track-rail while a carriage is moving over it, such being an essential part of my invention. Furthermore, I have no clock-work and descending weight, as set forth in such patent, and my mechanism operates very differently from that of such patent. I have no trigger or lever to be struck by the carriage in passing.

I claim—

1. The described railway-signal apparatus, consisting of the track-levers *D D*, battery *G*, signal-levers *E E*, switches *d d*, electro-magnets *F F*, studs *e e*, and circuit-wires *c f g*, arranged and applied to the track and the two posts, and to operate substantially as set forth.

2. The combination of the signal-lever *E*, electro-magnet *F*, circuit-wire *c g*, spring *d*, stud *e*, and lever *D*, applied to each of the posts and one of the rails, substantially and to operate as set forth.

CHAS. D. TISDALE.

Witnesses:

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