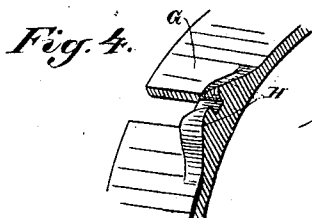
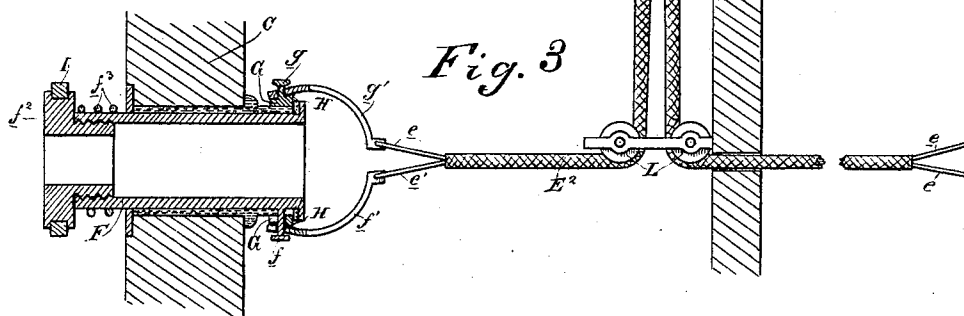
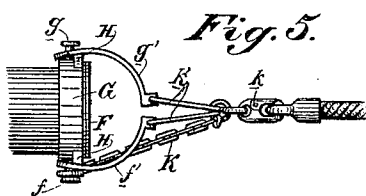
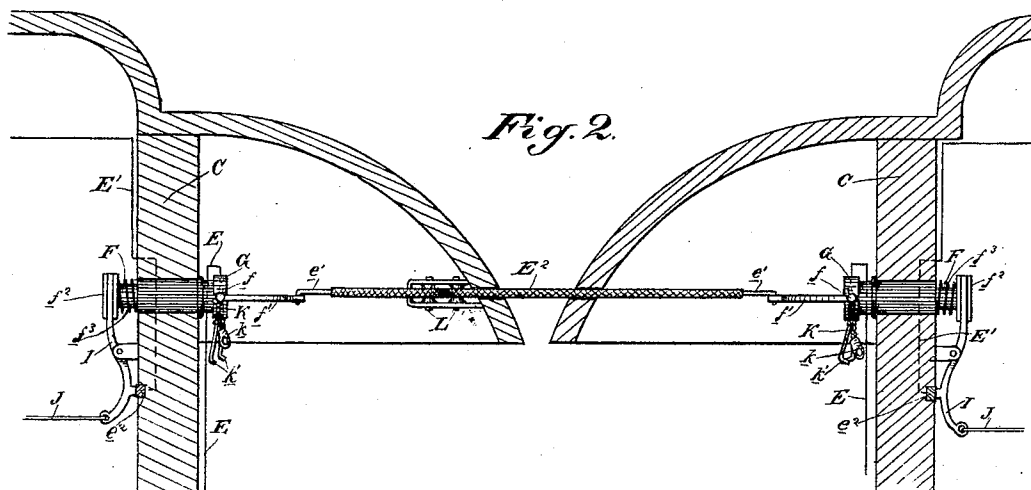
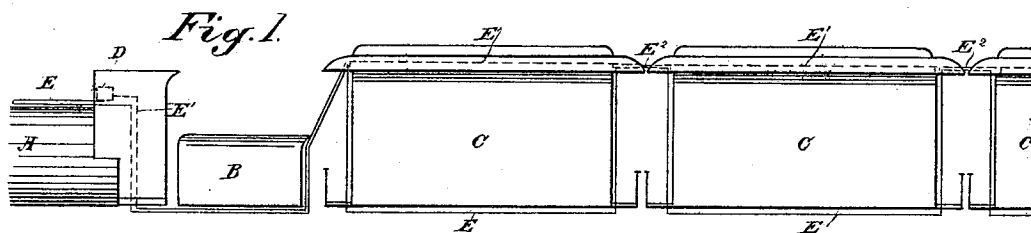


G. MERRITT.
ELECTRIC TRAIN SIGNAL.

Patented Aug. 16, 1892.



Witnesses,
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UNITED STATES PATENT OFFICE.

GEORGE MERRITT, OF SAN FRANCISCO, CALIFORNIA.

ELECTRIC TRAIN-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 481,042, dated August 16, 1892.

Application filed April 13, 1892. Serial No. 429,052. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MERRITT, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Electric Train-Signals; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of train-signals in which a signal or alarm bell is placed upon the locomotive and is operated by means of an electric circuit extending through the train of cars and adapted to be opened and closed to actuate and stop the bell.

My invention consists in the novel details of construction and arrangement relating to the course of the circuit-wires throughout the train, as I shall hereinafter fully describe and specifically point out in the claims.

The object of my invention is to provide a simple and effective electric train-signal which can be readily operated from or between any of the cars of the train and from any position in said cars and which will operate upon the breaking apart of the train.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a general view showing the course of the circuit through the train. Fig. 2 is a view showing the connection between adjacent cars. Fig. 3 is a horizontal section through the sliding rod F. Fig. 4 is a detail showing cams H on band G to separate arms g' and f' . Fig. 5 is a detail showing the connection with an unimproved car.

A is a locomotive, B the tender, and C the several cars of the train. Upon the locomotive in proper position, here shown as in the cab thereof, is an electric bell D, of any suitable pattern, the mechanism of which need not be shown, as it is sufficient to illustrate it by the box or casing represented. It is only needful to say that this bell is of the kind adapted to remain at rest when the circuit is closed and to be operated only when the circuit is open or broken. From this bell extend backwardly the circuit-wires E and E'. These are directed in a suitable manner back to the first coach or car of the train, and they are here shown as passing under the

tender. They both extend upwardly to the upper front portion of the first car.

In a hole in the end walls of each car, preferably in the hole already provided for the bell-cord, is mounted and adapted to slide longitudinally a metallic rod F, which may be solid, or, preferably, as here shown, tubular, in order to allow the passage of a common bell-cord, if desired. This rod is properly insulated to protect it and permit it to form a part of the circuit. On the outer end of the rod and separated from it by insulating material is a metallic band G. From one side of this band extends outwardly a post g , and from the opposite side of the end of the rod F extends a post f , which passes through an opening in the metallic band G and without touching it. Upon the post g is pivoted a metallic arm g' and upon the post f is pivoted a metallic arm f' . These two arms are bent toward each other and their ends approach and are adapted to be thrown into and out of contact with each other, according to the position of the arms themselves. This is effected by means of cam projections H, over which said arms play. When said arms are raised to a horizontal position, they travel over these cams and their outer ends are thereby spread, so that they are separated. When dropped to a vertical position, the arms traveling down the cams and being free thereof their outer ends approach and touch each other.

The wires E and E', where they lead up to the ends of the cars, are connected between said cars by insulated flexible cables E², incasing separate wires, forming continuations of the circuit-wires and provided at each end with hooks e , which connect with the wires E, and hooks e' , which connect with the wires E'. The hooks e are connected with the outer end of the arm g' and the hooks e' are connected with the outer end of the arm f' . The wire E again leads off from the post g , passes down the end of the car and under it, and up the outside of the other end of the car, where it forms a similar connection to the one described. The wire E' terminates with the hook e' , but begins again inside the wall of the car at a contact-piece e^2 , and thence said wire extends upwardly along the ceiling of the car to the other end, where it terminates in a

contact-piece similar to e^2 . Upon the inner end of the rod F is a head-plate f^2 , between which and the wall of the car is a spring f^3 , which tends to keep the rod F pulled inwardly to its limit. Engaging the head-plate f^2 is a lever I, which is pivoted at i , and its lower end is so bent as to adapt it to remain normally in contact with the contact-piece e^2 . To this lower end of the lever I is attached the cord J, which may be called the "bell-cord," and extends along the ceiling of the car in suitable hangers to the other end, where it is connected to a similar lever. Now it will be seen that the circuit is a normally-closed one, the current passing through one of the wires—say the wire E—to the connecting hooks e of the flexible cables E^2 between the cars, the arms g' , posts g , and thence under the cars and returning through the wires E' to the hooks e' of the flexible connecting-cables, posts f , rods F, levers I, contact-pieces e^2 , and along the ceilings of the cars. The circuit being a normally-closed one, the bell remains inoperative; but when the bell-cord J is pulled upon in any of the cars or at any part thereof the lever I is drawn out of contact with the piece e^2 and the circuit is opened or broken in the wires E' , and thereupon the bell is set in operation. The sliding rods F, being controlled by springs f^3 , serve to hold the levers I firmly against the contact-pieces e^2 . They also provide for breaking the circuit from between the cars as well as by the bell-cords inside, for by grasping the insulated connected cables E^2 between the cars the rod F will be pulled outwardly and will thereby throw the lever I out of contact with the piece e^2 . On the adjacent ends of the cars the arms g' and f' are normally in a horizontal position, with their ends separated; but at the rear end of the last car of the train these arms are down to a vertical position, in which their outer ends are in contact, thereby completing the circuit.

In order to provide for the attachment to the rear end of the train of a car not provided with my signal-circuit, I have hanging from the post f of the sliding rod F a chain K, the outer end of which carries a coupling k for the bell-cord of the attached and unimproved car. This chain also carries two metallic hooks k' , one of which is adapted to be hooked in the outer end of arm f' and the other in the outer end of arm g' , thereby electrically connecting said arms, which, being raised, would otherwise be out of contact. A pull upon the bell-cord in the last or unimproved car will thus pull out the rod F and open the circuit.

The wires E and E' , I have here shown as extended forwardly to the front end of the locomotive in order to be able to make the connection with the train when the locomotive is reversed end for end.

In order to provide for taking up the slack of the connecting-cables E^2 between the cars,

I pass a bight of the cable through horizontally-arranged guide-rollers L, secured to the end of the car, and connect said bight with a spring M. This will allow for the necessary yield of the cable and at the same time keep it properly taut and out of the way.

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

1. In an electric train-signal, the circuit-wires thereof extending throughout the train, in combination with a metallic rod passing through the car end and forming part of the circuit, a contact-piece also let into the circuit, and a pivoted lever electrically connected with the metallic rod and adapted to be moved into and out of electric connection with said contact-piece to close and open the circuit, substantially as herein described.

2. In an electric train-signal, the circuit-wires thereof extending throughout the train, in combination with a metallic rod passing through the car end and forming part of the circuit, a contact-piece within the car and also let into the circuit, a pivoted lever electrically connected with the metallic rod and adapted to make and break electrical connection with the contact-piece, and a cord extending within the car and connected with said lever, whereby it is operated, substantially as herein described.

3. In an electric train-signal, the circuit-wires thereof extending throughout the train, in combination with the sliding spring-controlled metallic rod passing through the end of the car and forming part of the circuit, the contact-piece within the car also let into the circuit, the pivoted lever electrically connected with the metallic rod and adapted to be thrown into and out of connection with the contact-piece, and connections between the cars for pulling the metallic rod outwardly to operate the lever, substantially as herein described.

4. In an electric train-signal, the circuit-wires thereof extending throughout the train, in combination with the sliding spring-controlled metallic rod passing through the end of the car and forming part of the circuit, the contact-piece within the car also let into the circuit, the pivoted lever electrically connected with the metallic rod and normally in contact with the contact-piece, the cord within the car for operating said lever to break connection with the contact-piece, and connections between the cars for pulling the metallic rod outwardly to throw its lever out of contact with said contact-piece, substantially as herein described.

5. In an electric train-signal, the combination of the circuit-wires, the sliding rods passing through the ends of the cars and having contact-levers, and the contact-pieces within the cars, with which the levers make and break electrical contact, and the flexible cables for carrying the circuit between the cars and elec-

trically connecting one of the circuit-wires with the sliding rods, substantially as herein described.

6. In an electric train-signal, the spring-controlled sliding rods in the ends of the cars, said rods having on their outer ends the bands G, insulated therefrom, and on their inner ends the swinging contact-levers, the contact-pieces within the cars, the arms carried at the outer end of the rods, one in electrical connection with the rods and the other with the bands G, the circuit-wire E, connected with bands G, the circuit-wire E', connected with the contact-pieces within the cars, and the flexible cables between the cars, having hooks electrically connecting the bands and the rods of adjacent cars, respectively, substantially as herein described.

7. In an electric train-signal, the combination of circuit-wires, the sliding spring-controlled rods F in the car ends, provided with contact-levers on their inner ends for making and breaking the circuit, and the contact-pieces within the cars, upon which the levers operate, the swinging arm f' , pivoted to the outer end of said rod, the swinging arm g' on the outer end of said rod and insulated therefrom, the cams on the rod for separating the ends of said arms and permitting their contact, and the flexible cables with hooks connecting the circuit-wires between the cars with the arms f' and g' , respectively, substantially as herein described.

8. In an electric train-signal, the combination of the circuit-wires E and E', the sliding

spring-controlled metallic rods F in the end walls of the cars, the pivoted arm f' on the outer end of the rod, the band G on said outer end and insulated therefrom, the pivoted arm g' of said band, the cams for throwing said arms into and out of contact, the flexible cable E², with hooks e and e' , connecting the circuit-wires E and E' with the arms g' and f' , respectively, the contact-pieces e^2 , with which the wires E' within the cars connect, the contact-levers I, carried by the sliding rods and adapted to make and break contact with the pieces e^2 , and the bell-cords J within the cars and connected with said levers, substantially as herein described.

9. In an electric train-signal, the combination of the sliding rod F of the circuit-breaker, having the arm f' and the insulated arm g' and the chain K, with its cord-coupling k and hooks k' , substantially as herein described.

10. In an electric train-signal, the flexible cables E², connecting the circuit-wires between the cars, in combination with the means for taking up the slack of said cables, consisting of the guides through which the bight of the cable passes, and the spring connected with said bight, substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE MERRITT.

Witnesses:

S. H. NOURSE,
J. A. BAYLESS.