(No Model.)

W. V. & J. H. ASH.

RAILWAY ELECTRIC SWITCH.

No. 528,898. Patented Nov. 6, 1894.

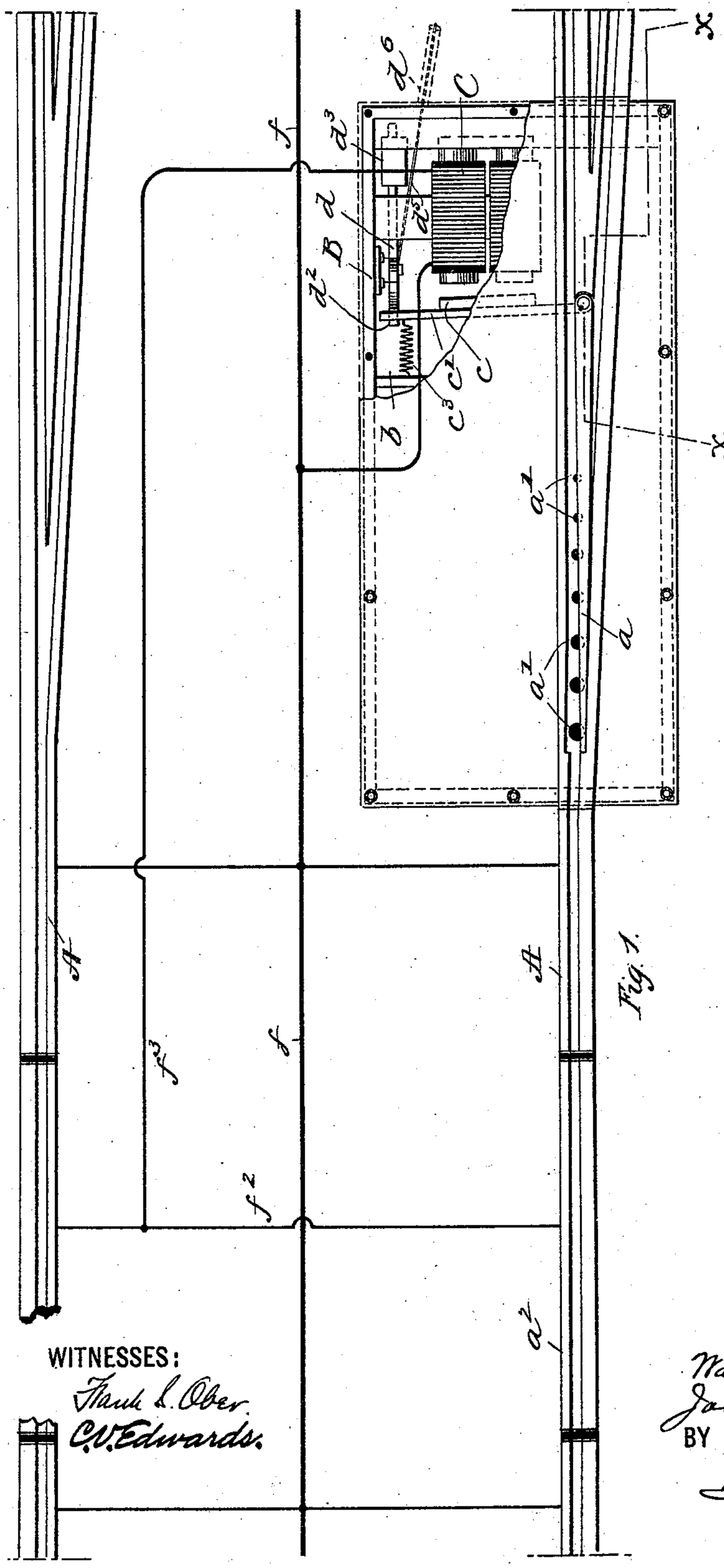

Fig. 1.

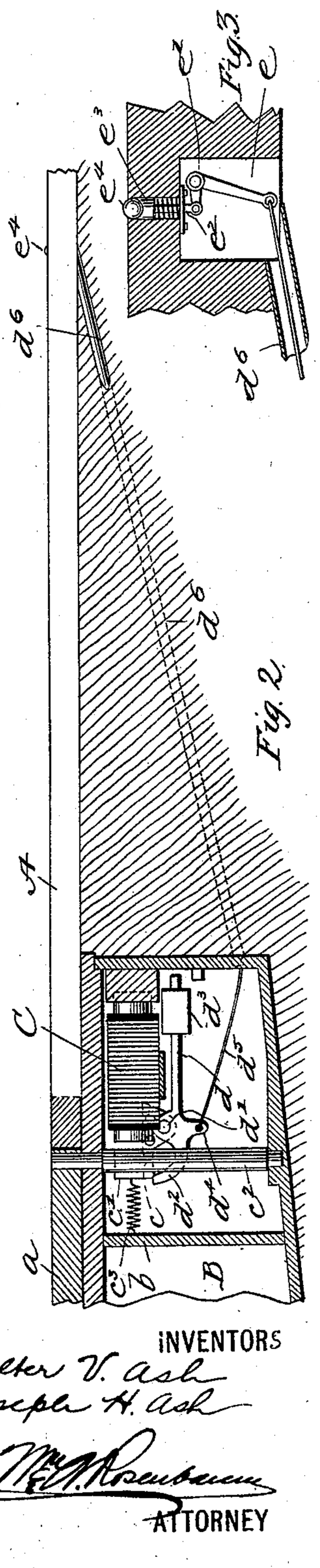

Fig. 2.

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RAILWAY ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 528,898, dated November 6, 1894.

Application filed July 5, 1894. Serial No. 516,538. (No model.)

To all whom it may concern:

Be it known that we, WALTER V. ASH and JOSEPH H. ASH, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway Electric Switches, of which the following is a full, clear, and exact description.

This invention relates to railway electric switches especially adapted for roads upon which the vehicles are propelled by electricity.

The object of the invention is to provide mechanism by which a car approaching a switch in the rails may automatically throw the switch if it is improperly placed, hold it locked while passing over the switch, and afterward release it and return it to its normal position. This is accomplished by a combination of electrical and mechanical devices, all of which will be fully described hereinafter and particularly pointed out in the claim.

In the accompanying drawings: Figure 1 is a conventional plan of a portion of a railway track adjacent to a switch, showing the features of my invention applied thereto. Fig. 2 is a section of the roadbed, taken on the line $x\ x$ of Fig. 1, and Fig. 3 is a detail of the tripping mechanism.

Referring to the drawings by letter, the rails of the track are represented by A, A, in one of which is located a vibrating switch point a of ordinary construction. Beneath the switch point and in the path of its movement, the rail is perforated at several points, as indicated by the holes a', to allow obstructing dust or gravel to be cleared away. At a short distance in advance of the switch point the rails are provided with a short insulated section a^2, it being understood that the return current from the motors on the vehicles passes through the rails of the track.

Beneath or adjacent to the switch point is located a sunken box B. It is divided into two compartments by the partition b and its bottom is inclined to carry all moisture toward one end. The lower end may be connected with a sewer. In one of these compartments is placed an electro-magnet C. This is mounted in a stationary position and its armature c is carried upon a lever c', the latter being attached to a vertical shaft c^2 which is adapted to rotate in suitable bearings in the top and bottom of the box, as shown in Fig. 2. The upper end of the shaft projects through the top of the box and enters the rear end of the switch point a', to which it is rigidly attached.

The free end of the lever c' has attached to it a spring c^3 which acts upon it in opposition to the electro-magnet. This end of the lever is also adapted to be locked in its forward position by a trigger lever d. This lever is pivoted between its extremities at the point d' and at one end is provided with a hook d^2, which, when the armature lever c' is distant from the magnet, rests against the said lever, but when the lever is standing at its nearest position to the heads of the magnet, the hook b^2 may pass up behind the lever and thus hold it in place. The end of the lever opposite the hook d^2 is extended and provided with a weight d^3 which causes the hook to rise when the armature lever is moved to its inward position.

The trigger is provided with an offset d^4 to which is attached one end of a cord d^5 leading over a suitable guide pulley or pulleys and through a conduit d^6 to a point in the track beyond or past the switch point a', where it enters a small chamber e, in which is pivoted a bell crank lever e'. The cord is attached to one end of this bell crank lever and to the other end is attached a vertical thrust rod e^2 carrying at its upper end a spherical socket e^3 in which rests a ball e^4. The ball projects slightly above the surface of the rail, but is held therein by the overhanging edges of the rail which form a part of the ball socket. Beneath the socket e^3 is placed a coil spring which tends to hold the socket in its uppermost position. The ball is located directly in the path of the car wheels.

The return wire conductor which usually serves as an adjunct to the rails is represented by f. To this the rails are connected in the

ordinary manner at intervals. The insulated section of the track, however, is not directly connected with this wire, but instead is connected by means of wires f^2 and f^3 with the electro-magnet C and thence to the wire f. It will thus be seen that the return current must pass through this magnet when the car is upon the insulated section of the rails.

In the operation of this switch, the motorman on the car approaching the switch, first ascertains whether the switch is in the position he requires it. Normally the switch will stand with the main line open. If the car wishes to go off on the branch, the motorman permits his car to pass on to the insulated section of rails without interrupting the current through the vehicle. When the car is upon the insulated section, the return current will energize magnet C and will thus cause lever c' to swing to its nearest position to the magnet. This will throw the switch point to the proper position for switching the car on to the branch line. The moment the lever c' is pulled toward the magnet, weight d^3 on the trigger lever acts and throws the hook d^2 behind lever c', thus locking it in position and preventing any other movement of the switch point while the car is passing over it and thus insures a safe passage to the car.

When the car is safely over the switch, its wheels strike the ball e^4 in the rail, thus thrusting the rod e^2 downward, causing the bell crank to swing and pull upon the cord d^5. This raises the weight d^3 and removes the detent from the lever c', and thereupon the spring c^3 returns the lever to its outer position and thus resets the switch point to its normal position.

In case the motorman finds the switch properly placed and he does not care to move it, he simply cuts off the current and allows the car to pass over the very short length of insulated track by inertia, after which he may turn on the current again and send the car over the switch by the usual motive power.

Ordinarily in railway electric switches of this character it is customary to allow the car to travel by its momentum across the switch, whenever the switch point is found to be properly placed when the car approaches. This is objectionable because it requires quite an extended movement of the car without the aid of its motor, and this on an up grade is oftentimes impossible. With our system, the length of travel by momentum of the car need only be the length of the car wheel base, and the car is thus allowed to be propelled positively over the switch.

Another feature of advantage of our invention is the fact that it comprehends the locking of the switch while the vehicle passes over it, thus preventing derailment.

Having thus described our invention, we claim—

The combination in a railway, of a vibrating switch-point; a pivoted armature lever fixed to said switch-point, an electro-magnet acting upon said armature lever, a trigger adapted to lock the same in one position, a cord connected with said trigger and extending to a distant point in the rails, a thrust rod projecting above the rails through an opening therein and adapted to be moved downward by the wheels of the vehicles running upon said rails and thereby moving the trigger and releasing the armature lever, substantially as described.

In testimony whereof we subscribe our signatures in presence of two witnesses.

WALTER V. ASH.
JOSEPH H. ASH.

Witnesses:
FRANK S. OBER,
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