

(No Model.)

3 Sheets—Sheet 1.

J. T. HAMBAY.

APPARATUS FOR CONTROLLING RAILWAY APPLIANCES BY ELECTRICITY.

No. 308,494.

Patented Nov. 25, 1884.

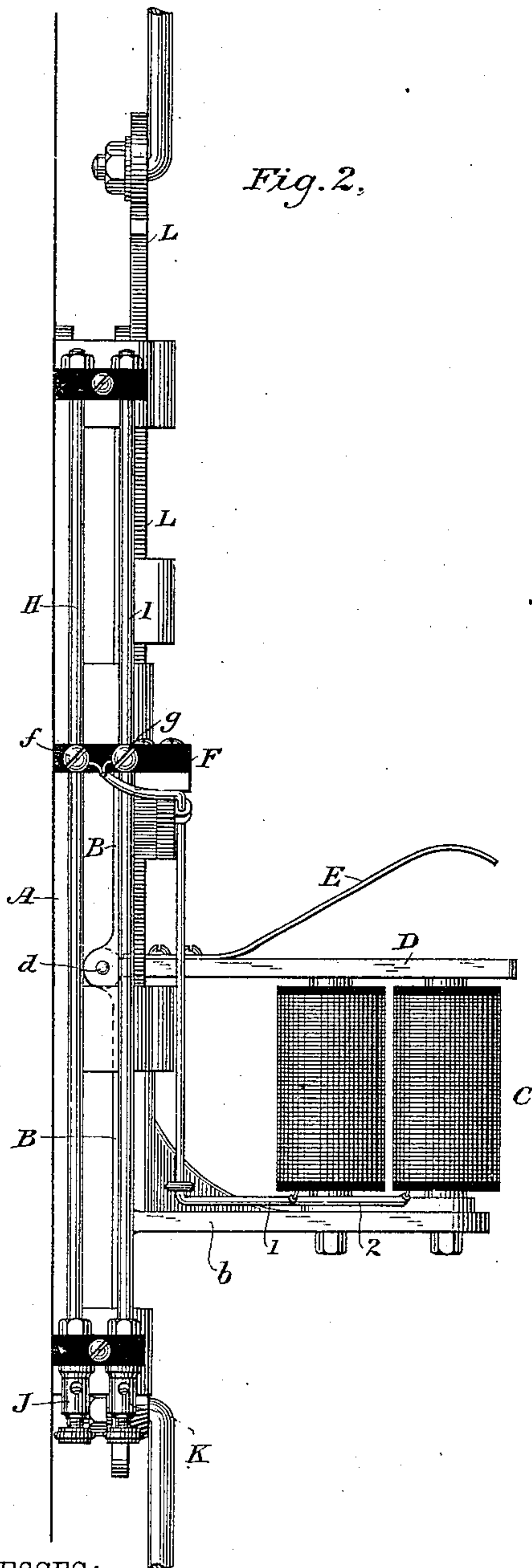


Fig. 2.

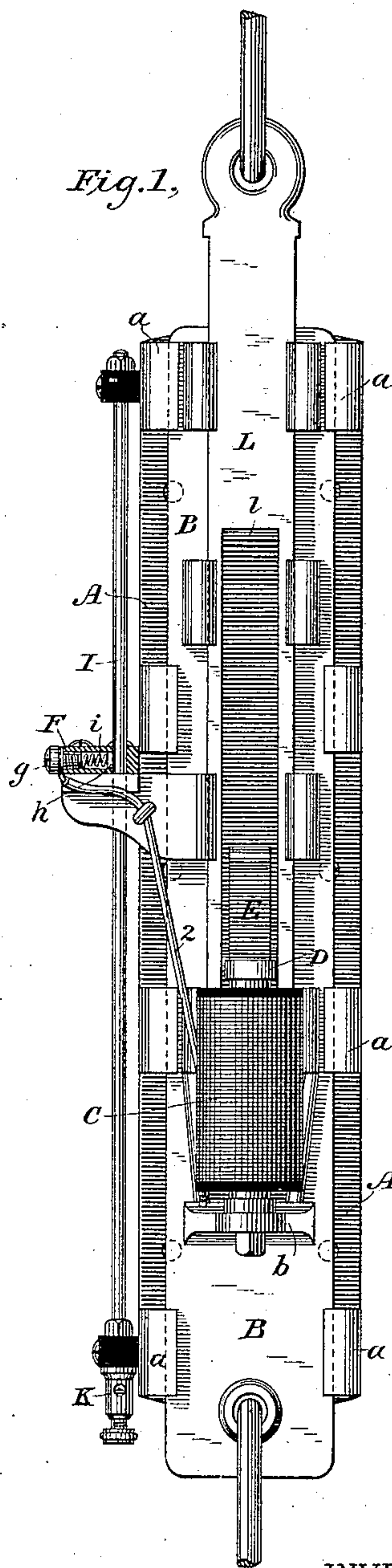


Fig. 1.

WITNESSES:

Wm. A. Shinkle.

Jos. S. Latimer

INVENTOR

James T. Hambay,

BY

Pope Edgecomb & Butler
ATTORNEYS

(No Model.)

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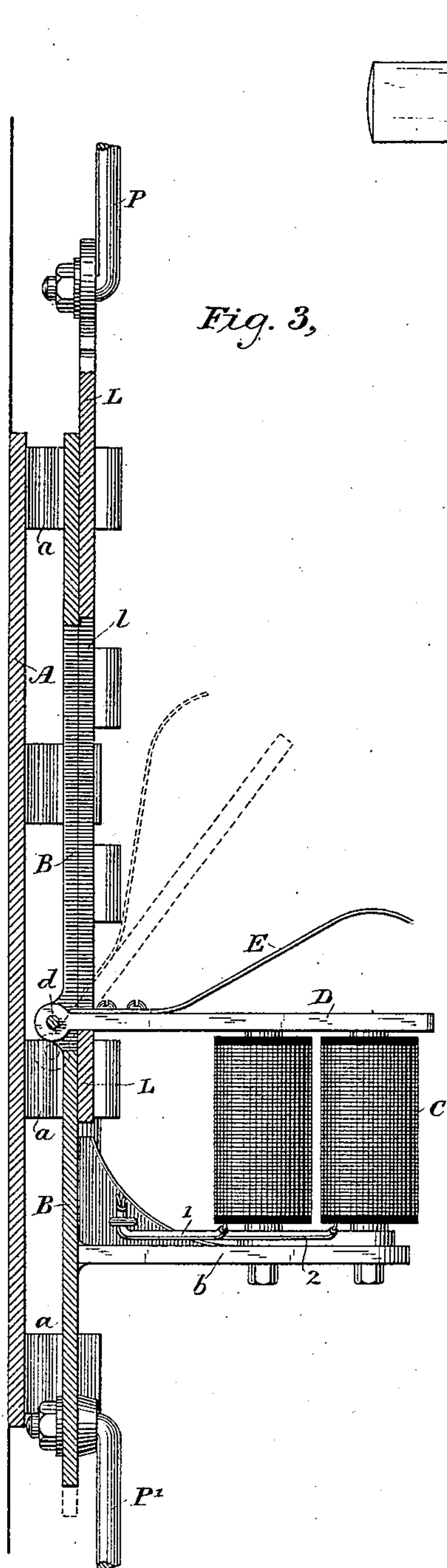


Fig. 3,

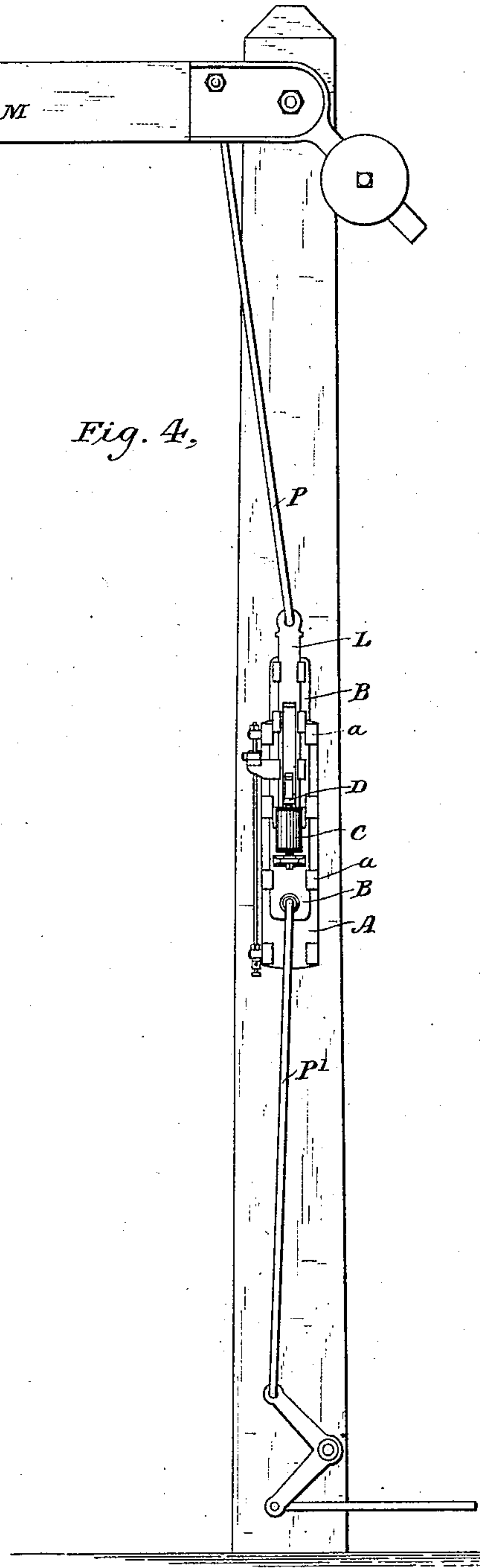


Fig. 4,

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(No Model.)

3 Sheets—Sheet 3.

J. T. HAMBAY.

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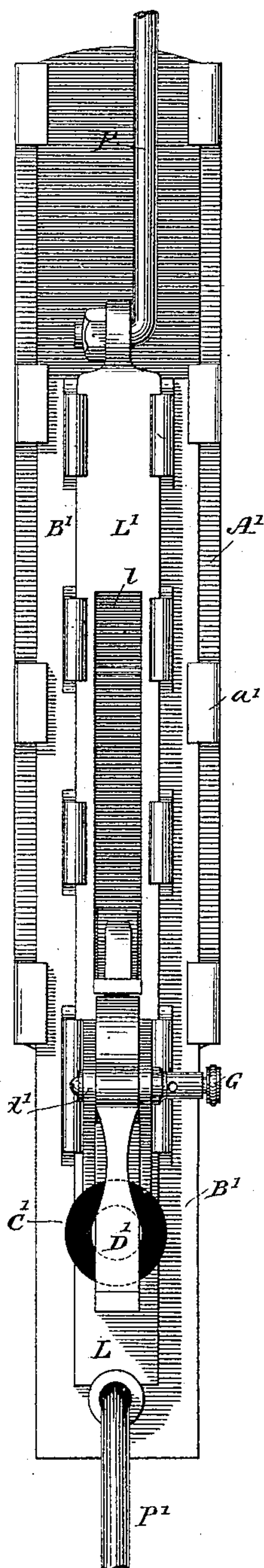


Fig. 5,

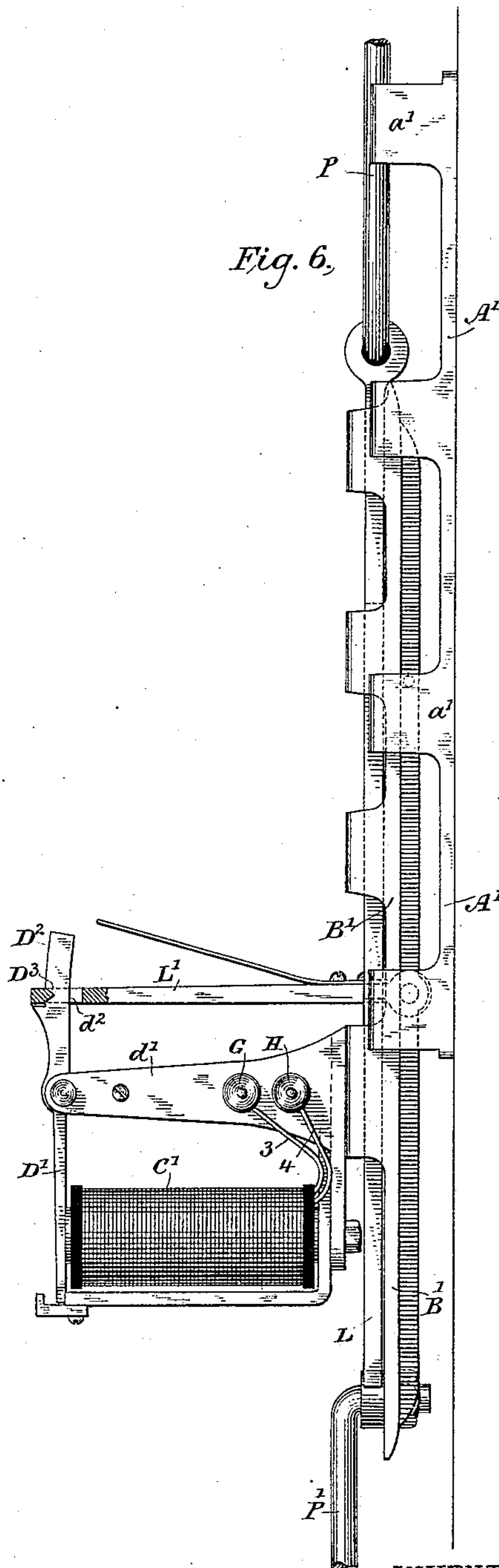


Fig. 6,

WITNESSES:

Wm a Skinkle
Garrie C. Ashley

INVENTOR

James T. Hambay,

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UNITED STATES PATENT OFFICE.

JAMES T. HAMBAY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE
UNION SWITCH AND SIGNAL COMPANY, OF SAME PLACE.

APPARATUS FOR CONTROLLING RAILWAY APPLIANCES BY ELECTRICITY.

SPECIFICATION forming part of Letters Patent No. 308,494, dated November 25, 1884.

Application filed April 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. HAMBAY, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Controlling Railway Appliances by Electricity, of which the following is a specification.

My invention relates to apparatus employed for actuating movable railway appliances—such as signals, locks, switch-rails, or any movable portion whatever of a railway superstructure, upon which the safety of passing trains directly or indirectly depends.

The object of the invention is to provide means for normally actuating a movable railway appliance—such, for example, as a visual or semaphore signal—either by hand or by any convenient power, and combining therewith means whereby the position of such appliance may either be reversed or caused to remain in its normal position by the action of independent controlling devices actuated by means of electricity from one or more points at a greater or less distance therefrom.

In illustration of my invention I have shown a movable semaphore-signal or other equivalent device and a system of levers and connecting-rods capable of being actuated in any convenient manner when it is desired to place the signal in a position to indicate "safety," and in interposing in this system a device which couples sections of the same together by means of a latch or detent and an electro-magnet controlling the same. Whenever the electro-magnet is vitalized the latch, by virtue of its attractive force, is held in position to connect the two sections of the mechanical organization for actuating the signal, and to cause the one to move with the other; but when, on the other hand, the electro-magnet is not vitalized the latch will readily yield to the force exerted upon it through the actuated portion or section of the mechanical system for raising the signal, and will not cause the other and now detached section to move. The signal itself is attached to this last-named portion of the system, while the power which actuates the signal is applied through the other section.

The electro-magnet hereinbefore referred to

is designed to be included in a normally-closed electric circuit, which circuit is intended to be extended to the various points from which it may be desired to control the signal or render it inoperative so far as giving an indication of safety is concerned. By interrupting this circuit or by short-circuiting the battery supplying the current thereto the electro-magnet will be demagnetized and the latch released, and during the continuance of such demagnetization the signal device will remain in the position indicating danger, even though its moving mechanism is actuated.

The application of my invention to the mechanism for moving a switch, a lock, or other equivalent device will be readily understood by those skilled in the art without further explanation.

In the accompanying drawings two methods of carrying out my invention, differing somewhat from each other in detail, are illustrated.

Figure 1 is a front elevation of one form of device, and Fig. 2 is a side elevation of the same. Fig. 3 is a vertical transverse section of this device, and Fig. 4 illustrates the particular method of applying it to a semaphore-signal. Figs. 5 and 6 are respectively a front and a side elevation of a modified form of the invention illustrated in Figs. 1, 2, 3, and 4.

Referring to the drawings, A represents a suitable support or frame, which is designed to be rigidly secured to any suitable stationary structure.

Within the frame A, mounted in suitable guides *a a*, is a vertically-movable plate, B, carrying upon a horizontal projection, *b*, an electro-magnet, C. The electro-magnet C is provided with an armature, D, which is pivoted at one end to the movable plate B, as seen at *d*. When the electro-magnet C is vitalized, the armature D will be held firmly against and in immediate contact with the poles of the magnet in the position shown in full lines in the drawings. When, however, the electro-magnet C is demagnetized, the armature D will, under the influence of sufficient force, be drawn away from the poles of the magnet and into the vertical position shown in dotted lines. For the purpose, however, of preventing the armature D from remaining in this vertical position when not held there by a

positive force, a spring, E, is so placed as to bear against the face opposite that confronting the electro-magnet. This spring serves to prevent the armature from remaining in a position back of its center, and thrusts it forward so far that it tends to fall toward the poles of the electro-magnet at all times by the action of gravity.

The respective terminals of the coils of the electro-magnet C are connected through conductors 1 and 2 with suitable screw-posts, *f* and *g*, which are mounted upon an insulated plate, F. The plate F carries suitable metallic contact-plates, *h*, which are pressed by spiral springs *i* against two rods, H and I, respectively, extending upon one side of the supporting-plate A. The rods H and I are insulated from each other and from the supporting-plate A, and they are provided with suitable binding-posts, J and K, respectively. By means of these binding-posts two conductors may be placed in electrical connection with the rods, and thus with the conductors 1 and 2 and with the respective terminals of the coils of the electro-magnet C, and these connections will be continued even while the plate B and the insulated plate F are moved up and down in their supports, since the contact-plates will continue to slide along and to make contact with the rods H and I.

Supported in the plate B is a second movable plate, L, which is provided with a slot or aperture, *l*, through which the latch or armature D is intended to extend. So long as the electro-magnet C remains vitalized the armature is held by attraction in contact with its poles with sufficient power to resist any force which it may be necessary to apply to the plate L in order to actuate a semaphore or other signal, since that force will be applied through to the armature at a point very close to its fulcrum, while the electro-magnets act through a considerable leverage. While the armature is in this position the plate L therefore remains securely locked to the plate B by reason of the contact of the upper end of the slot *l* with the armature D near its pivot *d*, and if the plate B be moved vertically the plate L will necessarily be carried along with it. When, however, the electro-magnet C becomes demagnetized the armature will instantly be drawn upward by the movement of the plate B and the two portions of the apparatus will be mechanically disconnected.

The application of my improved device to the operation of a semaphore-signal is effected as follows: The entire mechanism which has been described is intended to form a link in a connecting-rod, through which motion is transmitted to operate the signal. Thus the plate L is connected by a rod, P, with a movable signal-blade or semaphore-arm, M, while the plate B, on the other hand, is connected by means of a rod, P', with a suitable system of levers, by which the necessary power is applied to actuate the signal-blade. Thus if the blade M is required to stand normally in a

horizontal position by the action of a counter-balance when it is desired to indicate "danger" and to be drawn downward through the agency of the lever and connecting-rod to indicate "safety," then the device will be operated in precisely the usual manner of such apparatus so long as the electro-magnet C remains vitalized; but whenever the electro-magnet is demagnetized by the interruption of the circuit traversing its coils or by the short-circuiting of the battery normally connected therewith, then, although the system of actuating levers and rods may be actuated, yet the signal-blade M will remain in the horizontal position, for the reason that the mechanical connection between the movable plates L and B has been interrupted. The blade M, or other equivalent signal device which may be employed, is compelled by means of a counter-balance or other like device to automatically move into position to indicate "danger" when not positively held in position to indicate "safety" by the downward pull of the rod P' acting through the plates B and L. If, therefore, for any reason, it is desired at a distant signaling-point to render the safety-signal inoperative—that is to say, to prevent the semaphore-arm from being placed in a position to indicate "safety," or if already in such position to cause it to move into another position to indicate "danger"—it will be necessary only at such point either to interrupt the circuit leading to the binding-posts J and K or to short-circuit the battery. The electro-magnet C will thereupon be demagnetized, and its armature instantly released, and thereafter, although the plate B may be moved by the operator for the purpose of placing the signal in the position to indicate "safety," yet the plate L will remain unmoved and the signal will remain at "danger." The operator is enabled by this means to discover that for some reason the track is obstructed, and appropriate means may thereupon be taken, if necessary, for discovering the cause.

Referring now to the modification illustrated in Figs. 5 and 6, B' represents a movable plate, and C' the electro-magnet, which, in this instance, is placed horizontally. Applied to this electro-magnet is an armature, D', which is pivoted to a suitable bracket, *d'*, extending from the plate B'.

At the upper end of the armature-lever D' is carried a catch, D², for receiving a latch, D³, which is designed to normally couple or lock the plate L' to the plate B', in the same manner as hereinbefore described with reference to the armature D. When the electro-magnet C' is vitalized, the armature D' is held in the position shown in the drawings, against the pole of the magnet, and the latch D³ will be held in the position shown in the drawings by the catch D² entering a hole, *d*², formed therein. If, however, the electro-magnet be demagnetized, the armature will be permitted to recede from the electro-magnet, and

the latch D³ will therefore be free to be thrown upward when the plate B' is carried downward by its actuating-levers. The plate B' may then be actuated independently of the plate L, in precisely the same manner as described with reference to Figs. 1, 3, and 4.

It is not necessary in every instance to employ the rods H and I, described with reference to Figs. 1 and 2, as flexible conductors may be attached, as in Figs. 5 and 6, directly to binding-posts G and H upon the bracket d', and conductors 3 and 4 may lead from the respective terminals of the electro-magnet C' to those binding-posts.

I claim as my invention--

1. The combination, substantially as here-inbefore set forth, with a movable plate, of an electro-magnet carried thereon, a second plate movably supported upon or within the first-named plate, a latch or detent for coupling the second with the first named plate, and an electro-magnet which, when vitalized, retains said latch in a position to so couple said plates, and which, when demagnetized, permits said latch to uncouple said plates.

2. The combination, substantially as here-inbefore set forth, of a vertically-movable electro-magnet, a movable plate, a latch or detent for coupling said plate with said electro-magnet, and means, substantially such as described, for holding said latch in position to so couple said plate with said electro-magnet while the latter is vitalized.

3. The combination, substantially as here-inbefore set forth, of a vertically-movable electro-magnet and support for the same, of a vertically-movable plate, and a horizontal latch or detent for coupling said plate to the support of said electro-magnet, which latch is maintained in a horizontal position through the influence of the electro-magnet when vitalized, thereby engaging said plate, and which is permitted to be moved out of the path of said plate when said electro-magnet is demagnetized.

4. The combination, substantially as here-inbefore set forth, with an electro-magnet, a support for the same, and means for moving said support vertically, of a signal or other movable portion of a railway superstructure, a plate to which said movable portion is attached, means for mechanically coupling said plate to said movable support, consisting of a latch or detent extending through said plate, and an electro-magnet for retaining said latch in a position to engage the same when said electro-magnet is vitalized.

5. The combination, substantially as here-inbefore set forth, of a vertically-movable plate, an electro-magnet carried thereon, a second plate, a signal or other movable portion of a railway superstructure attached to one of said plates, and an armature for said electro-magnet, which armature, when attracted to the poles of said electro-magnet, couples said plates with each other, and which when released from said electro-magnet detaches the one plate from the other.

6. The combination, substantially as here-inbefore set forth, of a vertically-movable electro-magnet, a vertically-movable support for the same, a signal or other movable portion of a railway superstructure, a system of actuating-levers, an armature which serves, when attracted to the poles of said electro-magnet, to couple said levers with said vertically-movable support, two insulated conducting-rods, sliding contacts applied to said rods, and conductors leading from the respective terminals of the coils of said electro-magnet to said contacts.

In testimony whereof I have hereunto subscribed my name this 5th day of April, A. D. 1884.

JAMES T. HAMBAY.

Witnesses:

HENRY SNYDER,
CALEB H. JACKSON.