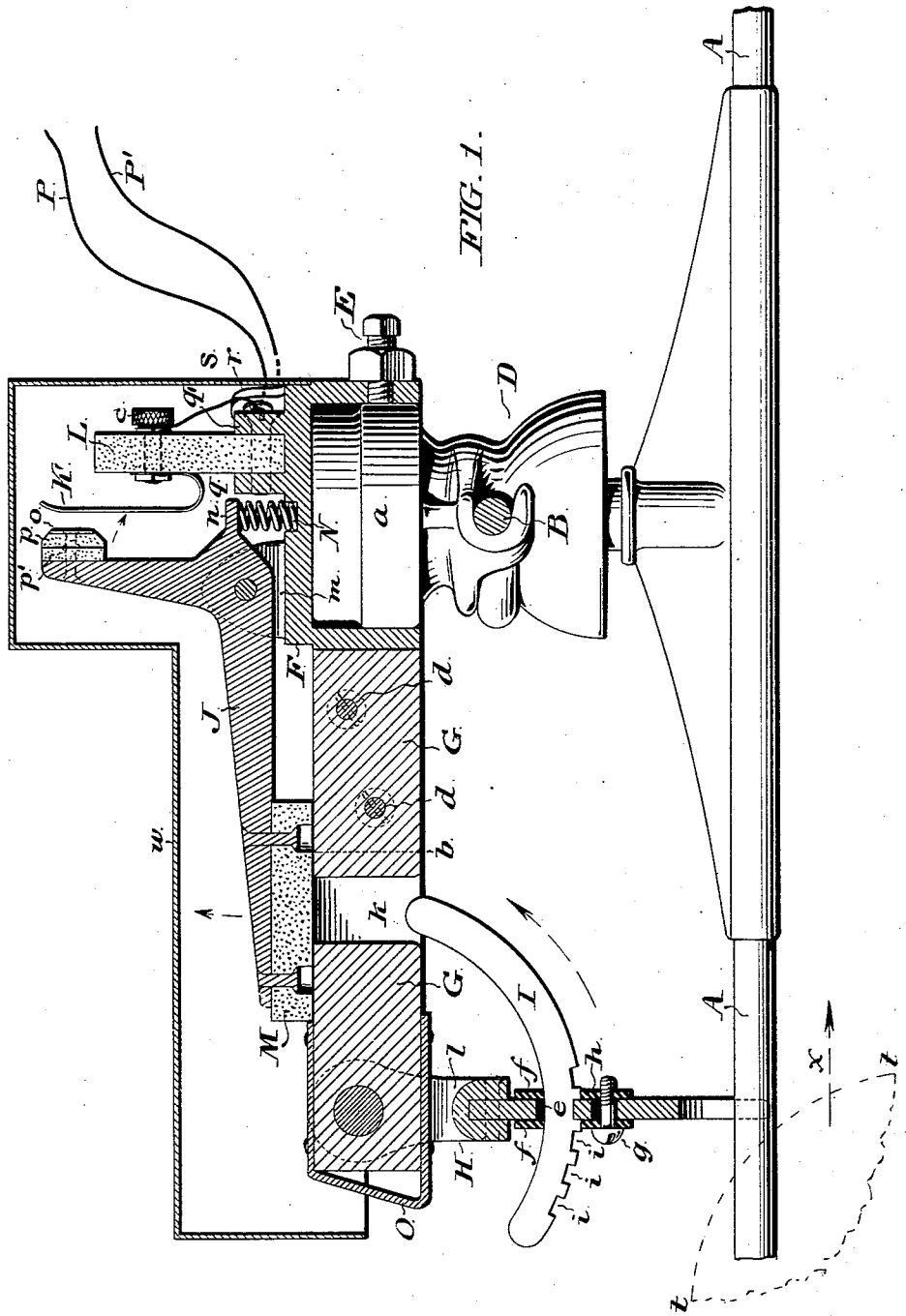
(No Model.) 2 Sheets—Sheet 1.

P. LÜPKE.

SIGNALING APPARATUS.

No. 564,706. Patented July 28, 1896.

FIG. 1.



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(No Model.) 2 Sheets—Sheet 2.

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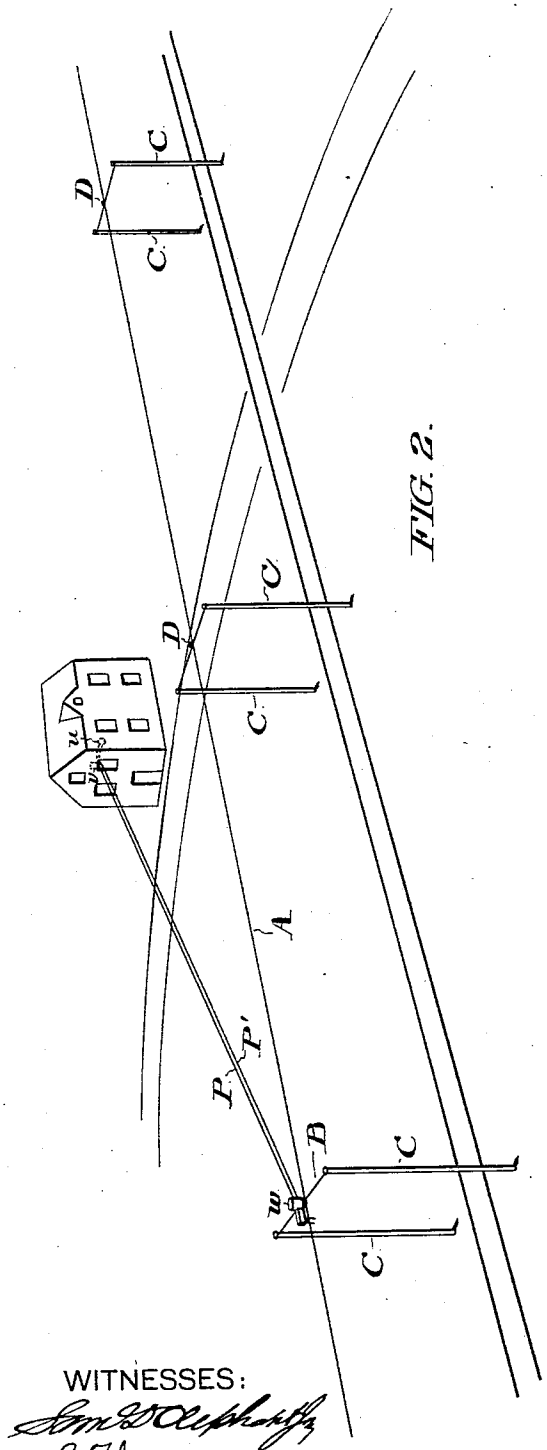

FIG. 2.

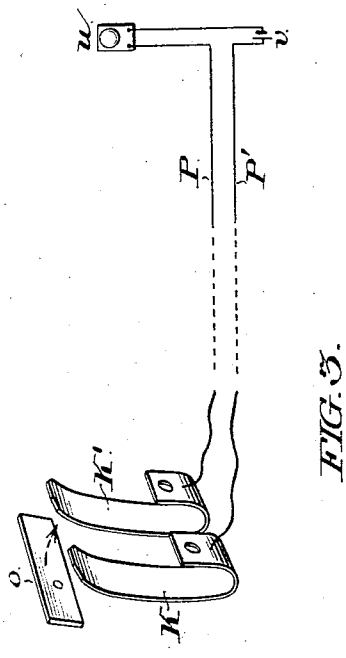

FIG. 3.

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UNITED STATES PATENT OFFICE.

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SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 564,706, dated July 28, 1896.

Application filed May 9, 1895. Serial No. 548,638. (No model.)

To all whom it may concern:

Be it known that I, PAUL LÜPKE, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Signaling Apparatuses, of which the following is a specification.

My improvement relates to that class of signaling apparatuses which are operated automatically by a passing vehicle to convey notice of its approach to a point in advance; and the object of my invention is to provide simple and effective means for enabling such signaling to be effected by electrically-propelled cars operating with a trolley running upon a wire.

In the drawings forming a part of this specification, Figure 1 is a central vertical sectional view of my apparatus, showing the same mounted upon a trolley-wire insulator. Fig. 2 is a perspective view of a portion of an electric railway, showing my apparatus in position and connected with a house near the railway; and Fig. 3 is a detailed view of the contact-springs and their connections.

In the drawings, A is the trolley-wire.

B is a span-wire connected with the trolley-poles C C and supporting the trolley-wire insulator D.

a is the cap of a trolley-insulator, which cap is utilized as a support for the operating mechanism of my signaling device.

F is the base of my device.

G is an arm or extension made of insulating material, preferably wood.

H is a swinging hanger.

I is a curved piece or extension adjustably connected with said hanger.

J is the contact-lever.

K K′ are contact-springs.

L is a support for said contact-springs.

M is an insulating-piece.

N is a spring for restoring the contact-lever J to its normal position after contact.

O is the stop.

P P′ are lead-wires connecting binding-posts *c* with the distant signaling apparatus.

The base F is made, preferably, of metal, which has cast integral with it two parallel projecting arms, which embrace the part G between them and to which said part G is made fast by screws or rivets *d d*. They are of the same height as the part G, and their outer end is indicated by the dotted line *b* in Fig. 1. The part G extends beyond the ends of the metal arms attached to the base F and out parallel to the trolley-wire A, and is made of insulating material of sufficient strength for the purpose, preferably of wood or fiber. This piece G is centrally slotted at *k* for a purpose to be mentioned hereinafter. The hanger H is swiveled upon a pin or lugs passing through or formed upon said part G and depends vertically therefrom. Upon the hanger H is fixed the part I, which is adapted to strike the insulating-piece M, attached to the contact-lever J, when the hanger is swung forward toward the trolley-wire insulator. I prefer to make the part I adjustable upon the hanger H, and do this by centrally slotting the hanger H at *e*. Notches *i i* are cut in the outer face or edge of the piece I, which notches are of a sufficient width to take in the depending bar of the hanger H, through which the part I passes. I attach two metal plates *f f* to the hanger H by the screw *g*. These plates *f f* are slotted similarly to the slot *e* in the hanger H. The screw *g*, which holds the plates *f f* upon the hanger H, passes through another slot *h* in the hanger H, which slot permits of a vertical adjustment of the plates *f f* upon the hanger. The projecting parts of the piece I between the notches *i i* therein are adapted to rest upon the lower walls of the slots in the plates *f f*, as shown in Fig. 1.

If it be desired to change the adjustment of the piece I relatively to the hanger H, the screw *g* is loosened, the plates *f f* are pushed up slightly to make the vertical slots therein register with the slot *e* in the hanger, and the piece I may be passed through the hanger in either direction until the proper position thereof is obtained, and it may then be readjusted substantially as shown in Fig. 1.

The lower end of the hanger H is forked to straddle the trolley-wire A and is hung in the path of the trolley-wheel, an arc of which is indicated by the dotted curved line *t t*. On the base F and integral therewith are formed two metal ears *m*, one of which is shown in outline in Fig. 1. Upon these ears *m* is swiveled a contact-lever J. To the under side of the long arm of said contact-lever is attached

a piece of insulating material M by screws or otherwise, which piece M rests normally upon the part G, as shown in Fig. 1. Projecting from the contact-lever J at its bend is a part n, which is sustained upon a spring N and receives its thrust. This spring N is seated upon the base F and assists in restoring the contact-lever to its normal position after it has been moved and retaining it therein. On the upper end of the short arm of the contact-lever J is attached a contact-bridge of metal o, which is, however, electrically insulated from the contact-lever by the insulating-pieces $p\,p'$. On the base-plate F are formed two ears or projections q q', preferably cast integral with the base, which pieces $q\,q'$ are bored and countersunk to receive two screws, one of which, r, is shown in outline in Fig. 1. Seated between these projections q q' and attached thereto by said screws is the insulating-support L. To this insulating-support are attached the contact-springs K K′ by binding-posts, one of which is shown at c in Fig. 1, and are thus respectively connected electrically with the wires P P′. These wires P P′ lead off from the binding-posts, respectively, through two lugs, one of which is shown in perspective at s in Fig. 1. Each of these lugs is provided with a lateral opening, through which one of the wires P P′ passes, and said openings are bushed with insulating material. The said wires lead off to any desired point, where the signal proper, such as a bell u, is located, and the circuit thus provided includes a battery v or other generator of electricity to operate the signal when the circuit is completed or closed by the pressure of the contact-bridge o against the contact-springs K K′.

As stated above, the entire apparatus is arranged to be automatically operated by the passing electric cars. The trolley, an arc of which is shown in Fig. 1 running along the trolley-wire A in the direction indicated by the arrow x, comes in contact with the forked lower end of the hanger H and throws it forward in the direction in which the trolley is moving, thus passing the curved piece I up within the slot k in the piece G until it strikes the insulating-piece M, attached to the contact-lever J, which is raised by the piece I until the contact-bridge o is brought into electrical contact with the contact-springs K K′, which thus immediately closes the circuit through the wires P P′, whereupon the battery or other generator of electricity sets in operation the distant bell or other signaling device. Instantly the trolley has passed under the hanger H the hanger falls back to its normal position by force of gravity, the contact-lever I resumes its normal position, in which it is shown in Fig. 1, and the circuit between the contact-bridge o and the distant signaling device is broken. If the cars pass in both directions under the same trolley-wire, a car moving in the opposite direction to the arrow x will throw the hanger H upwardly in the opposite direction until the part l of the hanger is brought in contact with the under side of the stop O, which prevents the hangers being thrown above the part G and permits it to drop to its normal depending position as soon as the trolley has passed.

To protect the operating device attached to the insulator B from the weather, I prefer to incase it in a metal covering w, which is shown in section in Fig. 1, and is attached to the base F by screws (not shown) or in any other convenient manner. This case or covering w has two vertical slots formed in it, (not shown in the drawings,) which slots coincide with the bushed openings in the lugs $s\,s$ when the covering w is in position on the operating mechanism forming the circuit-closer, and as said slots are opened to the bottom of the cover no difficulty is experienced in placing the cover properly upon the circuit-closer.

As will be readily understood, the distant signal may be operated by breaking instead of closing the circuit indicated in the drawings. This may be effected by reversing the arrangement of the contact bridge and springs so that they shall remain normally in contact and be separated by the operation of the lever J, and by adding a relay and local circuit, or by operating the signal by any convenient mechanical means through the breaking of said circuit. The circuit-closer (or circuit-breaker in the latter modification) may also be modified in various ways, and may be arranged to be set in operation by the contact of a part thereof with the trolley-poles of the passing cars or any projecting part of the car, and even the location of the operating mechanism may be changed. I do not, therefore, wish to be confined to the precise construction shown; but

What I claim is—

1. In a signaling apparatus, the combination with an electric circuit including a signal to be operated, of a circuit-closing device adapted to be supported above the trolley-wire of an electric railway, and comprising a base having a slotted extension of non-conducting material, a depending contact-hanger pivoted to said extension, and adapted to be struck by the trolley-wheel, and carrying an arm adapted to project through the slot of said extension, an insulated contact-lever fulcrumed upon said base and normally resting over said slot, and electrical contact-points for closing the circuit when said lever is raised; substantially as described.

2. The herein-described circuit-closer adapted to be supported upon the insulator on the span-wire of a trolley-railway, consisting of a base recessed to fit upon said insulator and provided with an arm or extension of wood or other non-conducting material, said arm having a transverse slot, a lever fulcrumed upon said base, one arm of said lever supporting a contact-bridge, while its other

arm is provided with a block of insulating material to rest over said slot, a pivoted hanger depending from the outer end of said arm extension and carrying a curved adjustable arm adapted to raise said lever and throw its contact-bridge against electrical contact-springs also supported upon said base; substantially as described.

3. The combination with the base and slotted block G secured thereto, of the insulating-block L, springs K, K′, the lever J and its contact-bridge, said bridge being insulated from the lever, a block M of insulating material and a swinging hanger and means connected therewith for raising the lever J; substantially as described.

4. In a circuit-closing device adapted to be operated by a pivoted hanger when the latter is struck by a traveling obstruction, the combination with the slotted hanger H, of the curved adjustable arm I provided with a series of slots, and secured by parallel plates *f*, *f*; substantially as described.

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Witnesses:
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