(No Model.) 2 Sheets—Sheet 1.

M. STOBRAWA.

CONTACT DEVICE FOR CONDUIT ELECTRIC RAILWAYS.

No. 566,035. Patented Aug. 18, 1896.

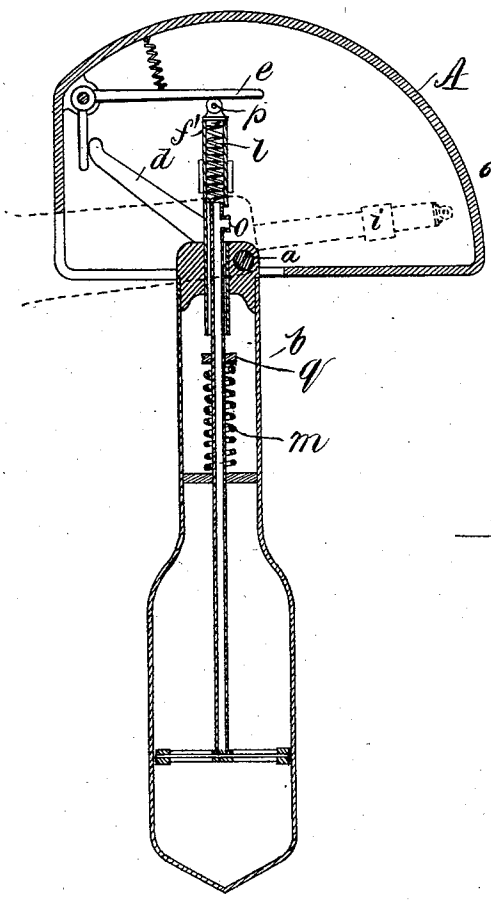

FIG. 1

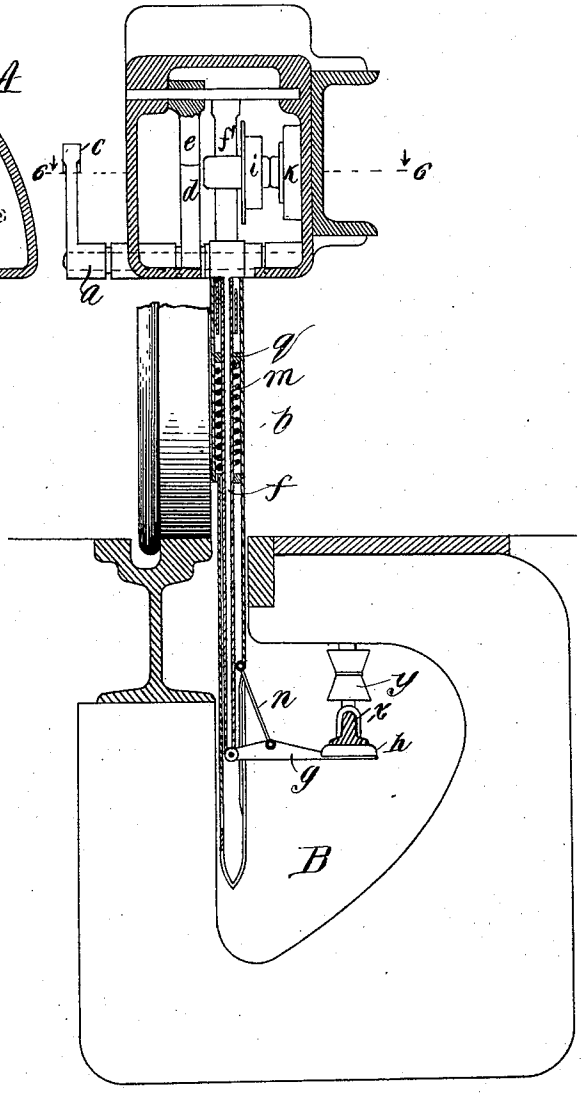

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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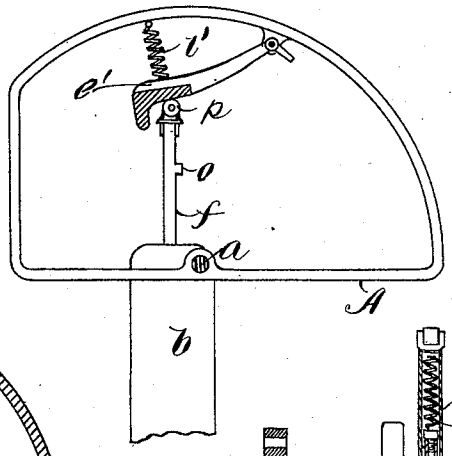


Fig. 4

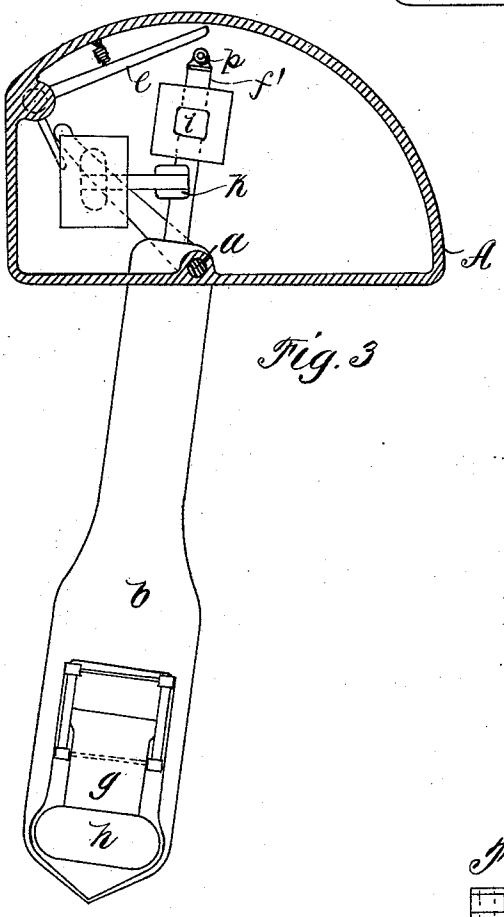


Fig. 3

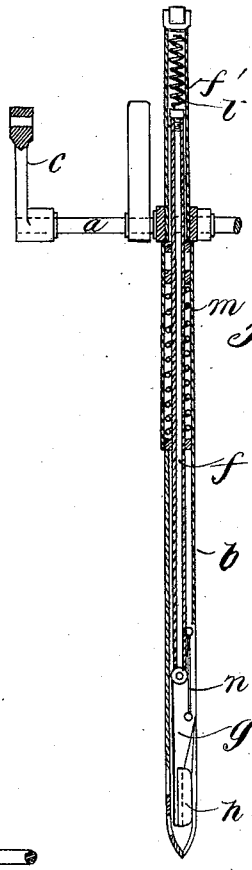
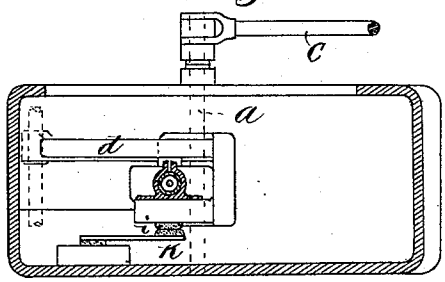


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

MAX STOBRAWA, OF DRESDEN, GERMANY, ASSIGNOR TO THE SIEMENS & HALSKE ELECTRIC COMPANY OF AMERICA, OF CHICAGO, ILLINOIS.

CONTACT DEVICE FOR CONDUIT ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 566,035, dated August 18, 1896.

Application filed April 10, 1896. Serial No. 586,914. (No model.) Patented in England March 21, 1895, No. 5,936; in Italy April 12, 1895, No. 38,460; in Austria June 1, 1895, No. 45/1,948; in Hungary June 18, 1895, No. 3,048, and in France June 21, 1895, No. 245,980.

To all whom it may concern:

Be it known that I, MAX STOBRAWA, a subject of the Emperor of Germany, residing at Dresden, Germany, have invented new and useful Improvements in Contact Devices for Conduit Electric Railways, (Case No. 40,) of which the following is a specification, and for which Letters Patent have been granted in Great Britain, No. 5,936, dated March 21, 1895; in Italy, No. 38,460, dated April 12, 1895; in France, No. 245,980, dated June 21, 1895; in Austria, No. 45/1,948, dated June 1, 1895, and in Hungary, No. 3,048, dated June 18, 1895.

My invention relates to an improved form of contact device or current-collector for conduit electric railways. The object of my invention is to provide a device easily operated from the motor-car, for the conduction of the current from the conduit to the motor, that may be put to ordinary usage without liability of being easily disordered, and permits the conduit to be constructed with a narrow slot or opening through which the contact device may be inserted and form immediate electrical connection with the current-supplying conductor. Furthermore, the device, upon meeting with any obstruction, will automatically break the circuit, withdraw the contact from the conduit, and fold backward out of the way of such obstruction without damage.

The device of the present invention consists of a contact-lever hinged or pivoted to the car or vehicle adapted to be swung into the conduit, said lever carrying upon or near the lower end a contact arm and shoe together with the mechanism for extending the latter when the whole is inserted within the conduit to form electric contact with the current-supplying conductor and for folding said arm and shoe back into the plane of the contact-lever when about to be removed from the conduit.

I will describe my invention more particularly by reference to the accompanying drawings.

Figure 1 is a longitudinal view in section of one form of the contact device. Fig. 2 is a transverse sectional view of the contact device with the contact-shoe in position for receiving current from a supply-conductor located within a conduit. Fig. 3 is a view, partially in section, illustrating the arrangement within the casing for forming the motor connections and operating the contact arm and shoe. Fig. 4 is a sectional view illustrating a modification of the mechanism for operating the contact-shoe. Fig. 5 is a detached view of the contact-lever, illustrating the detailed construction thereof. Fig. 6 is a sectional view on line 6 6, Fig. 2.

Like letters refer to like parts throughout the several figures.

Referring to Fig. 1, an outer casing A, attached to the vehicle, has shaft *a* journaled therein, to which are secured contact-lever *b*, arm *d*, and operating-lever *c*, Fig. 2. In the first two figures the device is shown in position for receiving current from the supply-conductor within conduit B. The rod *f* is of tubular form, through which may be carried the wire connecting shoe *h* and contact *i*. The said rod bears near its end the contact-arm *g*, pivoted thereto, which is constructed of some insulating material, as rubber, and is connected to the lever *b* by link *n* near the middle of said arm.

The contact-lever *b* is hollow and acts as a sheath or casing for the working parts of the contact device contained therein. The contact-arm *g* bears at its end current-collecting shoe *h*, shown in contact with supply-conductor *x*, which is supported by a series of insulators *y* within the conduit B.

The shoulder *q* on rod *f* is acted upon by coiled spring *m*, which tends to force the rod upward, but is opposed by a stronger spring *l* at the upper end of said rod when roller *p* is engaged by bell-crank *e*. The arm *d* is secured to shaft *a* at such an angle that when lever *b* is in a vertical position the said arm bears against the shorter limb of bell-crank *e*, forcing downward the rod *f* by means of roller *p* and spring *l*, secured in position above rod *f* by the tube *f'*. This construction insures a firm contact of the shoe *h* against supply-conductor *x* while the contact-lever is vertically extended into the conduit, but when said lever is swung to the left, as shown

in Fig. 3, the longer limb of bell-crank *e* is disengaged from the roller *p*, so that spring *l* no longer opposes spring *m*, which now forces the rod *f* upward, thus drawing contact-arm *g* and shoe *h* within the sheath *b* in the plane of said rod *f*, as illustrated in Figs. 3 and 5. The device thus is at once in proper position for removal from the conduit through the slot provided therein, whether forced from a vertical position by striking an obstruction or acted upon by lever *c* from the car.

Fig. 4 presents a modified form of this device for accomplishing the above result by placing spring *l'* at the top of casing A, so as to depress the vertically-moving rod as before by means of roller *p* engaging with the hinged arm *e'*.

An opening *o* in hollow rod *f* is provided, through which extends an insulated wire connected with contact *i* at the upper end of rod *f* and shoe *h* below. When the contact-lever is in a vertical position, contacts *i* and *k* are maintained in electrical connection and a feed-wire extending from contact *k* to the motor completes the connection between the conductor *x* and said motor. Upon moving the contact-lever *b* from the vertical the contact *i*, carried upon the extension or tube *f'*, swings forward and at the same time is forced upward by spring *m* until in the position shown in Fig. 3, thereby breaking the electrical connection at contact *k* instantly by the action of said spring *m*.

For its protection the entire device is covered by casing A and contact-lever *b*, except operating-lever *c*, contact-arm *g*, and shoe *h*. The two latter normally lie within the lower part of the contact-lever *b*, but through an opening provided in one side thereof are extended when it is desired to make contact with the supply-conductor *x*. A slot provided at the bottom and rear of casing *a* permits the lever *b* to be swung out of the conduit into the position shown by the dotted lines in Fig. 1.

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

1. In a contact device for conduit electric railways, the combination with an arm or lever pivotally mounted upon the vehicle and adapted to enter the slot provided in the conduit, of a contact or shoe carried upon said pivoted lever adapted to electrically engage the current-supplying conductor within the conduit, and a rod connected with the said contact or shoe, the movement of which is adapted to actuate the same into engagement with the supply-conductor or move said contact into position for removal from the conduit, substantially as described.

2. In a contact device for conduit electric railways, the combination with an arm or lever carried upon the vehicle and adapted to enter the slot of the conduit, of a lever pivoted to the lower end of said arm and carrying a contact or shoe, a longitudinally-movable rod connected with said lever for rocking the same upon its pivot to bring the shoe into engagement with the supply-conductor or to fold the pivoted lever into the plane of the arm to permit the withdrawal of the contact device from the slot, and means for imparting longitudinal movement to said longitudinally-movable rod; substantially as described.

3. In a contact device for conduit electric railways, the combination with an arm or lever pivoted to the vehicle and adapted to enter the slot of the conduit, of a lever pivoted to the lower end thereof and carrying a contact or shoe adapted to engage the supply-conductor, means for moving said pivoted contact into engagement with the supply-conductor or into the plane of said arm, and contacts controlling the circuit through the motor operated by the rocking of the arm upon its pivot; substantially as described.

4. In a contact device for conduit electric railways, the combination with an arm or lever pivoted to the vehicle and adapted to enter the conduit, of a contact or shoe mounted upon the lower end thereof adapted to engage with the supply-conductor, a longitudinally-movable element adapted when depressed to move the contact-shoe into engagement with the supply-conductor, a spring opposing the depression of said longitudinally-movable element, a movable contact carried upon the longitudinally-movable element, a stationary contact adapted to be engaged by said movable contact when the said longitudinally-movable element is depressed, and means controlled by the pivoted arm or lever for releasing said spring to effect the separation of said contacts; substantially as described.

5. In a contact device for conduit electric railways, the combination with an arm or lever *b* pivoted to the vehicle, of a hollow rod *f* longitudinally movable therein, a contact-arm *g* pivoted at the lower end of said rod, a contact-shoe *h* mounted upon the said arm, a link *n* connected at its ends with arm *g* and lever *b* respectively, a spring *m* adapted to oppose the depression of rod *f*, a sleeve or tube *f'* supported upon the upper end of rod *f*, a spring *l* situated between the top of rod *f* and the end of tube *f'*, an operating-lever *c* and arm *d* mounted to move with arm *b*, a bell-crank *e*, one end thereof adapted to be engaged by arm *d* and the other end by the tube *f'* when the lever *b* is in a vertical position; substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

MAX STOBRAWA.

Witnesses:
MAX SCHIEMANN,
OSKAR RICHTER.