D. ROUSSEAU.

Circuit Closers for Railroad-Signals.

No. 166,558. Patented Aug. 10, 1875.

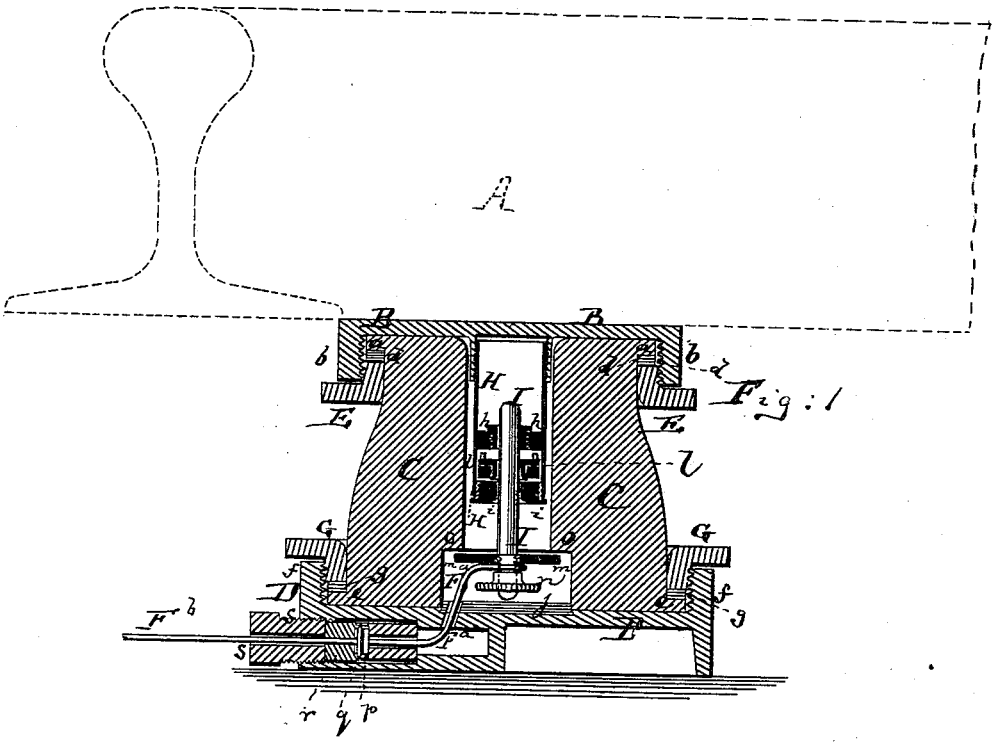

Fig: 1

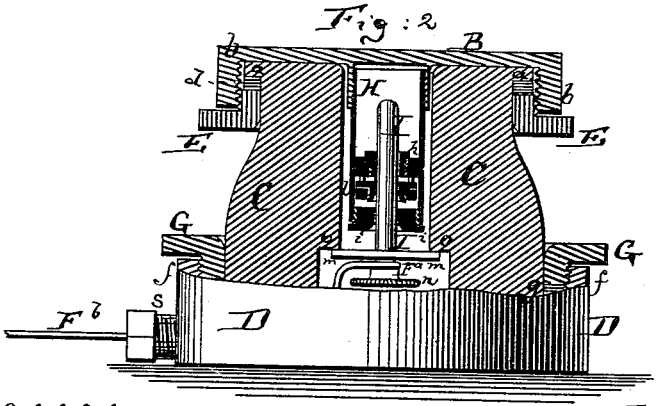

Fig: 2

Witnesses:

A. Moraga.

O. A. Weidner.

Inventor:

David Rousseau

by his attorney

A. v. Briesen

UNITED STATES PATENT OFFICE.

DAVID ROUSSEAU, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM F. SMITH AND SAMUEL SAMUELS, OF SAME PLACE.

IMPROVEMENT IN CIRCUIT-CLOSERS FOR RAILROAD-SIGNALS.

Specification forming part of Letters Patent No. **166,558**, dated August 10, 1875; application filed July 21, 1875.

CASE B.

To all whom it may concern:

Be it known that I, DAVID ROUSSEAU, of New York city, in the county and State of New York, have invented a new and Improved Circuit-Closer for Railroad-Signals, of which the following is a specification:

This invention has for its object to improve the circuit-closer which is described in Letters Patent No. 140,953, granted to me July 15, 1873, and to prevent, more particularly, the contact of the conductor with the upper plate of the circuit-closer after the train has left the superposed rail.

My present invention consists, chiefly, in attaching to the upper plate of the circuit-closer a pendent tube, which carries at its lower end an annular plate, and above said annular plate another, both arranged to embrace a rod that projects upwardly through them. Between these annular plates a circuit-closing sleeve is fitted upon the said rod, in such a manner that the least upward or downward motion of the rail and top plate will cause the sleeve to break or close metallic contact with the upper annular plate.

One somewhat objectionable feature of my former circuit-closer was, that if the rubber cushion should fail to throw the top plate of the closer up to a sufficient height after a train had left the rail, the metal contact between the conductor and such top plate and rail would not be broken, and the current, therefore, rendered continuous when it was desired to have the same interrupted. This objection I have now entirely overcome.

Another feature of my present invention is, the production of means for obtaining a water-proof joint where the cable or underground wire enters the instrument. My invention also has other features of improvement, which will hereinafter be more fully specified.

In the accompanying drawings, Figure 1 represents a vertical central section of my improved circuit-closer. Fig. 2 is a similar section, showing the circuit closed.

Similar letters of reference indicate corresponding parts in both figures.

A represents a portion of a railroad-rail. Beneath the same, and in contact therewith, is a metal plate, B, resting on a rubber or other insulating cushion or support, C, which, in turn, rests upon a bed-plate, D. The cushion C is, by preference, made hollow to receive the end of a telegraph wire or cable, F, which enters into the hollow of the cushion, as shown. The rubber cushion C is flanged at the upper and lower ends, the upper flange *a* entering within a pendent flange, *b*, of the top plate B, where it is confined in position by a screw-ring, E, a washer-ring, *d*, being interposed between such screw-ring and the flange *a* of the cushion. The lower flange *e* of the cushion is confined in a similar way by a screw-ring, G, in an upwardly-projecting flange, *f*, of the lower plate or bed-plate, D, a washer-ring, *g*, being interposed between the flange *e* and the ring G. This mode of fastening the cushion I deem preferable to that shown in the former patent, because it provides more intimate connection of the parts. From the middle of the top plate B is suspended into the hollow of the cushion C a metal tube, H, which carries within it, at a certain distance above its lower end, an annular fixed plate, *h*, that is in metallic connection with the body of the tube. The lower end of the tube receives a screw-ring, *i*, of rubber or other non-conducting material. I is a rod, which rests with its lower end on a non-conducting disk, *j*, which is placed upon the bed-plate D. The rod I extends through the ring *i*, and also through the ring *h*, the inner circumference of the latter-named ring being provided with a non-conducting lining, so as to prevent metallic contact between *h* and I. *l* is a sleeve, which embraces the rod I between the rings *h i*, and which is, by preference, made of two semi-annular pieces of metal, that are crowded against the sides of the rod I by a surrounding rubber ring, as indicated in the drawing. The upper surface of the sleeve is metallic, and has, preferably, projecting metal pins, as indicated. The lower part of the rod I is in metallic contact with the wire F.

As thus far described, the operation of the

circuit-closer is as follows: The distance between the rings *h i* is so regulated that a very small space will intervene for the play of the sleeve *l* between them, practically not more than one-sixteenth of an inch. When the parts are in the position indicated in Fig. 1—that is, when the cushion C is fully expanded, and the rail A is not weighted down—the metal pins or surface of the sleeve *l* will be a short distance away from the metal ring *h*, and metallic contact between the conductor F and rail A will therefore be interrupted; but as soon as a train passes over the rail, weighting the same down, the top plate B is depressed, and with it the cushion, and by the motion of the top plate the metal ring *h* is carried down into contact with the metallic parts of the sleeve *l*. A current is thus established. Now, if the downward motion of the bed-plate should, under the pressure of a heavy train, be very large, it will cause the sleeve *l* to move down with it along and on the rod I; and while the sleeve is thus forced down by the ring *h*, a space of about one-sixteenth of an inch will intervene between the lower part of the said sleeve and the upper face of the ring *i*, all as in Fig. 2. After the train has passed over the rail, and the same is no longer weighted, the cushion C will expand, and if the expanding motion be ever so small it will suffice to carry the ring *h* away from the sleeve *l*, and thus to break the circuit. If the expanding motion of the cushion C be sufficient to raise the rail to its original normal position, the sleeve will, by contact with the lower ring *i*, be raised in proportionate degree; yet its upper surface will never be more than about one-sixteenth of an inch from the lower surface of the metal ring *h*, and consequently it will afterward only require a short downward motion of the rail, under comparatively light pressure, to re-establish metal connection.

The conductor F is shown to be made in two pieces, one piece pertaining to the instrument proper, and marked F^a, and the other piece leading to the instrument from under ground, and marked F^b. The inner piece F^a is coiled around the rod I, and is clamped to a disk, *m*, that embraces said rod by a nut, *n*, as shown, the upper surface of the disk *m* being also in contact with an inner shoulder, *o*, formed in the cushion C. The outer end of the conductor F^a, being the end that is to connect with the conductor F^b, has fastened to it a plate, *p*, against which a plate, *q*, formed on the inner end of the wire or conductor F^b, is pressed. A rubber cushion, *r*, surrounds the wire F^b directly behind the plate *q*, and enters a socket of the bed-plate D. A hollow screw, *s*, is screwed into this socket against the cushion *r*, causing the same to press the plate *q* firmly against *p*, and also, at the same time, to expand against the walls of the socket, and to produce a water-tight joint, by which the entrance of moisture into the instrument will be entirely prevented.

The entrance of moisture will, of course, also be prevented by the screw-rings E and G, which are applied directly to the cushion ends.

The instrument can be used as a circuit-breaker by making the lower face of the sleeve *l* and the upper face of the ring *i* metallic.

I claim as my invention—

1. The combination of the tube H, formed on the circuit-closer, with the inner rings or plates *h i*, and with the sliding sleeve or plate *l*, substantially as described.

2. The rod I, placed within the cushion C, and through the rings *i h*, and combined with the sleeve *l* and plate B, substantially as and for the purpose specified.

3. The cushion C, flanged on top and bottom, and combined with the plates B and D, and screw-rings E and G, substantially as set forth.

4. The conductor F^b, carrying the plate *q*, combined with the conductor F^a, carrying the plate *p*, and with the cushion *r* and screw *s*, substantially as and for the purpose specified.

5. The combination of the upper and lower movable plate *h i* with the intermediate plate or sleeve *l*, which is capable of motion, all arranged to constitute a circuit-closer, substantially as specified.

The foregoing description of my invention signed by me this 15th day of July, 1875.

DAVID ROUSSEAU.

Witnesses:

A. V. BRIESEN,

E. C. WEBB.