

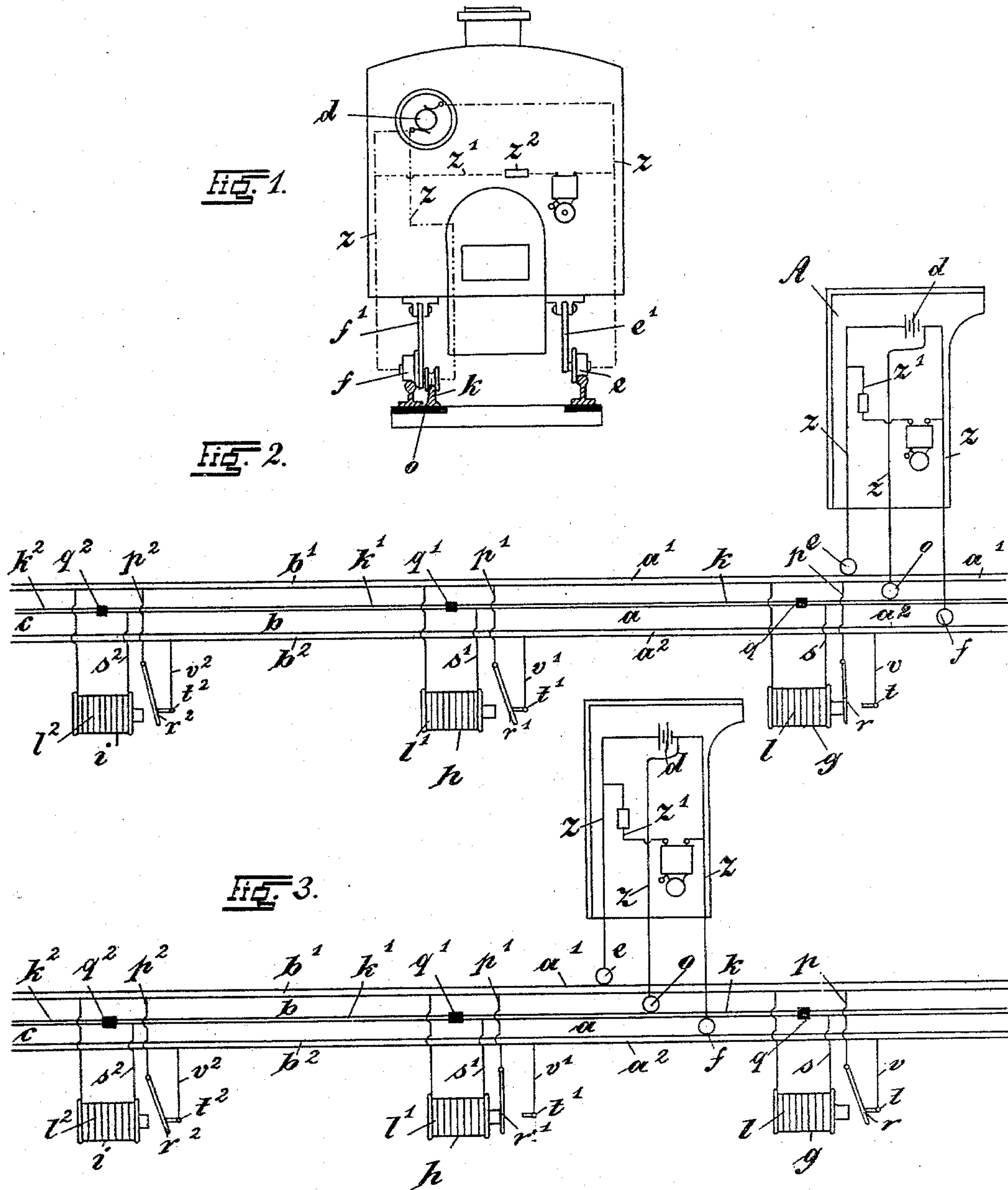
(No Model.)

H. BIERMANN.

DEVICE FOR PREVENTING ACCIDENTS ON RAILROADS.

No. 598,062.

Patented Jan. 25, 1898.



Witnesses:
H. E. DeGner.
Paul Fisher,

Inventor:
Hermann Piernan
by his Attorney:
Dr. J. Schanz & Co

UNITED STATES PATENT OFFICE.

HERMANN BIERMANN, OF BRESLAU, GERMANY.

DEVICE FOR PREVENTING ACCIDENTS ON RAILROADS.

SPECIFICATION forming part of Letters Patent No. 598,062, dated January 25, 1898.

Application filed April 6, 1896. Serial No. 586,444. (No model.)

To all whom it may concern:

Be it known that I, HERMANN BIERMANN, merchant, of 5^a Paradiesstrasse, Breslau, in the Province of Silesia, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Means for Preventing Accidents on Railroads, of which the following is a specification.

My invention relates to a device for preventing accidents on railroads caused by the breaking or loosening of rails or of the connecting parts, as fish-plates, screws, and the like; and the object of my invention is to actuate by means of electricity the alarm and safety apparatuses of the train when a rail has broken or a fish-plate is loosened before the train has reached the defective spot. I attain this object by means of arrangements illustrated in the accompanying drawings, in which—

Figure 1 shows the back view of a locomotive provided with the current-generator and the conductors. Figs. 2 and 3 show diagrammatically a part of the track with a main line and a secondary line.

The track is used as a main line for the electric current flowing from the current-generator d of the locomotive and is divided in several fields $a b c$, non-insulated from each other by means of wires $p v p' v' p^2 v^2$ or other conductors. At the end of each field a contact device is arranged for the purpose of interrupting the main line of each field and conducting the current over the next field and back to the current-generator by means of a secondary line formed by means of the wires $k k' k^2$, insulated from each other at $q q' q^2$, respectively. For every direction in which the train passes a secondary conductor is required, although in the drawings the arrangement is shown only for one direction. (Indicated by arrow.) At the end of the field a the rails a' and a^2 are connected with the wires p and v , and these wires are passed through the contact device g , connecting the wires by means of a spring r and a contact t , the spring r forming the armature of an electromagnet l , electrically connected with the rail a' and with the wire k too by means of a wire s .

At the end of the field b the contact device h is arranged, having the same construction and the same connection to the rails $b' b^2$ and

the wire k' of this field, as well as the contact device g with the rails and wire of its field a . The arrangement of the contact device i , connected with the rails $c' c^2$ and the wire k^2 of the field c , is made similarly to that of the contact device of the field a . In the three contact devices similar reference-letters refer to similar parts, and the letters of the contact device b and c have the additional numerals 1 and 2, respectively.

The locomotive has two contact-levers e' and f' . The lever f' is provided with two rolls f and o , insulated from each other and from the lever f' and connected with the one terminal of the current-generator d by means of wires z , while the roll e of the lever e' is connected with the other terminal of the current-generator by means of a wire z . With the wires z connecting the roll f and e with the current-generator a secondary conductor z' is connected, in which alarm and safety apparatuses and a resistance z^2 are put.

When the train A passes into the field a , (see Fig. 4,) the roll o slides over the wire k , and a secondary current flows from the rail a' through the electromagnet l , wire s' , wire k , roll o , and back to the current-generator, whereby the armature r' is attracted and the electrical connection between the rails a' and a^2 is interrupted. The primary current flowing from the current-generator through the roll e and the rail a' cannot pass any more through the contact device h , the rail a^2 , roll f , and back to the current-generator, but is compelled to flow through the rail b' of the field b , wire v^2 , contact device i , wire p^2 , rail b^2 , rail a^2 , roll f , and back to the current-generator. However, when a resistance of a greater intensity than that of the resistance z^2 put in the secondary conductor z' is produced in the field b through the loosening of a fish-plate or the breaking of a rail, the resistance z^2 will be overcome and the primary current flows through the secondary conductor z' back to the current-generator and actuates in this way the alarm and safety apparatuses of the conductor z' . In this manner the field b is controlled by the current-generator in the field a . The same control of the field c may be effected when the current-generator passes into the field b , whereby the field a has become without current.

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

1. In a device for preventing railroad accidents through break or loosening of rails, the combination of a current-generator arranged in the train, with a main-line circuit adapted to be put in electrical connection with the current-generator and consisting of the rails of the track and divided in several fields, each field being connected by means of two wires with a contact device adapted to be put out of the circuit of the main line, a secondary-line circuit comprising wires insulated from each other at the end of each field of the main line, said circuit being connected with the main-line circuit through the contact device and a secondary conductor on the cab connecting the terminal wires of the current-generator and containing a resistance and the alarm and safety apparatuses of the train, substantially as and for the purpose set forth.

2. In a device for preventing railroad accidents through break or loosening of rails, the combination of a current-generator ar-

anged in the train, with a main-line circuit adapted to be put in electrical connection with the current-generator and consisting of the rails of the track and divided in several fields by means of wires, a secondary-line circuit comprising wires insulated from each other at the end of each of said fields, said circuit being put in the circuit of the main line, a secondary conductor on the cab connecting the terminal wires of the current-generator and containing a resistance and the alarm and safety apparatus of the train, a contact device arranged at the end of each field and comprising a spring-lever adapted to connect the two wires forming the field, and an electromagnet electrically connected with the main line and the secondary line, substantially as and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HERMANN BIERMANN.

Witnesses:

EWALD BÖEHM,

HERMANN BARTSCH.