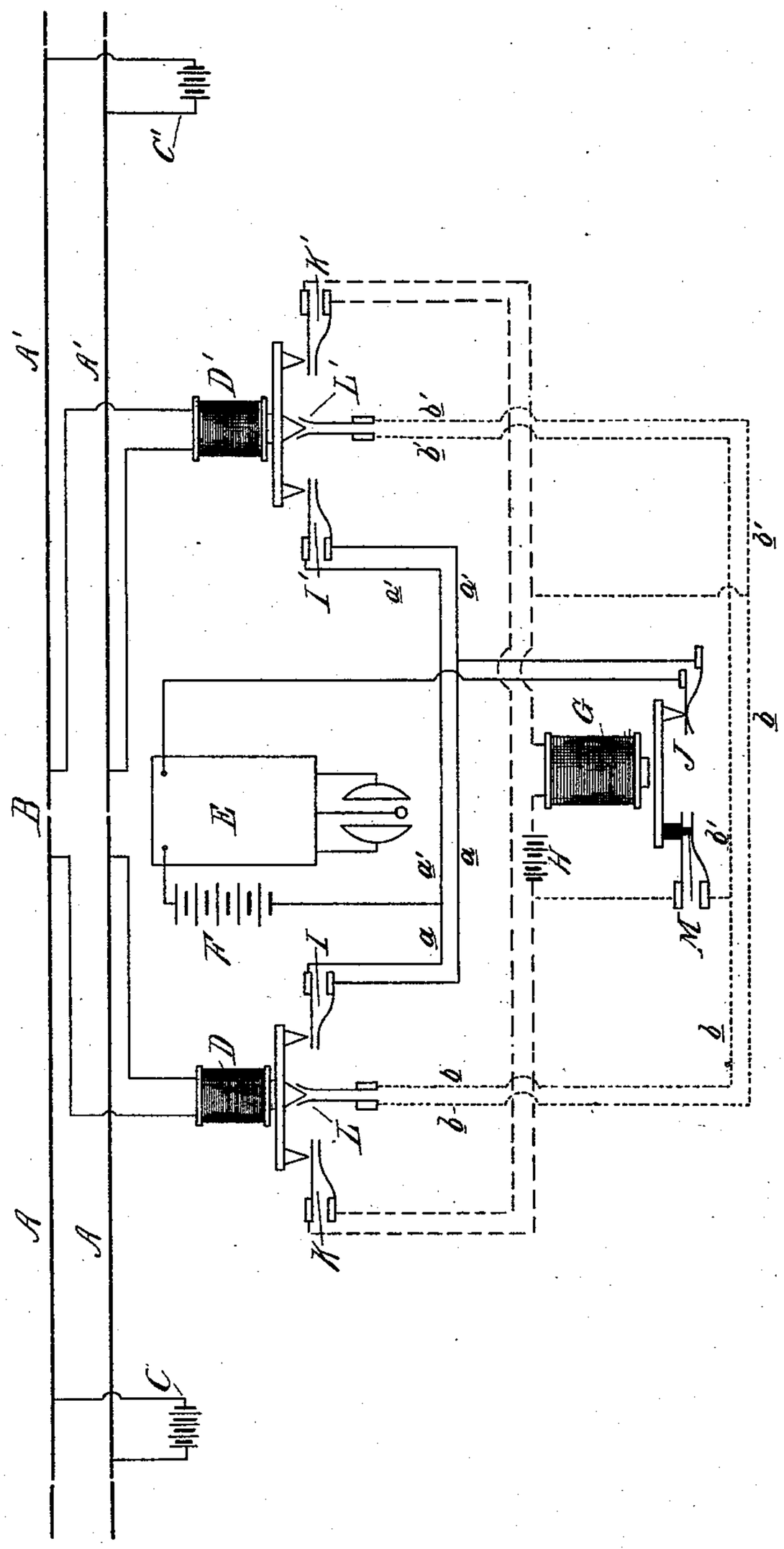
(No Model.)

J. J. ROSS.

ELECTRIC ALARM SIGNAL FOR RAILWAY CROSSINGS.

No. 522,431. Patented July 3, 1894.



Witnesses:
O. F. Barthel.
Thos. S. Dougherty

Inventor:
James J. Ross,
By Thos. S. Sprague & Son,
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES J. ROSS, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO GEORGE R. HOLDEN, OF SAME PLACE.

ELECTRIC-ALARM SIGNAL FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 522,431, dated July 3, 1894.

Application filed April 17, 1894. Serial No. 507,854. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. ROSS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electric-Alarm Signals for Railway-Crossings, of which the following is a specification, reference being had therein to the accompanying drawing.

The object of this invention is to signal the approach of a train to a crossing by an audible signal.

To this end the invention consists in the peculiar arrangement and combination of electrical appliances controlled by a train in passing a crossing with an electric alarm bell located at the crossing, whereby said appliances control the proper ringing of said bell by opening and closing suitable breaks in the circuit of the bell, all as more fully hereinafter described and specifically set forth in the claims.

In the drawing which shows the invention in diagram, A A and A′ A′ represent the rails of a single track railway on opposite sides of the crossing located at B, and these rails for a certain distance from the crossing are insulated from each other and the rest of the track in any suitable manner, so as to constitute conductor rails.

C C′ are two batteries, and D D′ are two electro-magnets, which I will hereinafter call track relays and these batteries and track relays are connected through the rails, as shown, whereby two normally closed rail circuits are formed on opposite sides of the crossing each containing a battery and a track relay.

E is the electric alarm bell located in proximity to the crossing, F is the battery for actuating the bell, G is a controlling relay and H is a local battery for energizing the same.

The arrangement of the circuits is as follows: The bell circuit which is shown in full lines contains two branches *a a′*, the branch *a* includes a normally open break I which is controlled by the armature of the relay D and the branch *a′* contains a corresponding break I′ controlled by the armature of the relay D′, further the bell circuit includes a normally closed break J which is controlled by the armature of the controlling relay G. The local battery includes the controlling relay in a main and shunt circuit, the main circuit (which is shown in broken lines) includes two normally open breaks K K′ which are controlled by the armatures of the relay magnets D D′, the shunt circuit (which is shown in dotted lines) contains two normally open breaks L L′ which are located in two branches *b b′* of the shunt circuit and a normally open break M which is controlled by the armature of the controlling relay.

The parts being thus constructed as shown and described they are intended to operate as follows: In the normal condition of the parts (which is shown in the drawing) the rail circuits are normally closed and the track relays being thus energized hold open the breaks K, L I, and K′ L′ I′, and the circuits of the bell and controlling relay are also open, the armature of the latter therefore holds the break M open while the break J is closed. If a train however approaches the crossing the moment it enters upon the rail circuits A A (or upon the rail circuit A′ A′ if the train approaches from the other side) the rails are short circuited by the axle and wheels and consequently the relay magnet in circuit therewith is cut out and its armature drops. Suppose the train to be approaching from the left upon the rails A A, then as soon as the armature of the track relay D drops, the bell circuit is closed from the battery F through the branch *a* by way of the break I (which is now closed) and the break J (which was already closed), the bell therefore begins ringing. It keeps ringing until the train after passing the crossing enters upon the rail circuit A′ A′, immediately it does this, the rails A′ A′ become short circuited and the relay D′ is also cut out and its armature closes the breaks K′ L′ I′. This closes the main circuit of the local battery by way of the breaks K K′ (both of which are now closed) and therefore energizes the controlling relay G which attracts its armature and thereby opens the breaks J in the signal circuit which stops the further ringing of the bell. As soon as the train leaves the track circuit A A the relay D becomes immediately energized again and therefore restores the normal condition of the track relay D. This also breaks the main circuit of the local

battery, but the controlling relay still remains energized by way of the branch *b'* of the shunt circuit which has become closed through the closing of the break M. After the train leaves the track circuit A' A' the relay D' assumes its normal condition, and thereby opens the break L' in the shunt circuit, and also restores the controlling relay.

As the device operates in the same manner if a train approaches from the right, it is not necessary to describe it any further.

The way in which the signal operates is thus to ring an alarm from the moment a train approaches the crossing on the track circuits until it is astride of the crossing when it ceases to ring, the track circuits therefor should be made suitably long to give the proper time required.

What I claim as my invention is—

1. In an electric signal for railway crossing, the combination of three electric circuits, one containing an electric alarm and the other two circuits forming the main and shunt circuit of a locking relay, two normally open breaks in each circuit, those of the alarm circuit and the shunt circuit being located in two branches—one break being adapted to be closed on the passage of a train over a portion of the track on one side of the crossing and the other on the passage of the train over a portion of the track on the other side of the crossing, and two breaks controlled by the locking relay one normally open included in the shunt circuit, and one normally closed included in the alarm circuit, all substantially as described.

2. In an electric railway signal, the combination of two normally closed rail circuits at opposite sides of a crossing each including a track relay adapted to be short circuited by the train while passing over the rails of an electric alarm circuit having two branches containing normally open breaks controlled by the track relays, a controlling relay provided with a main and shunt circuit, two normally open breaks in said main circuit controlled by the track relays, two normally open breaks in branches of the shunt circuit controlled by the track relays, a normally open break in the shunt circuit controlled by the controlling relay, and a normally closed break in the alarm circuit controlled by the controlling relay, substantially as described.

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

JAMES J. ROSS.

Witnesses:
M. B. O'DOGHERTY,
O. F. BARTHEL.