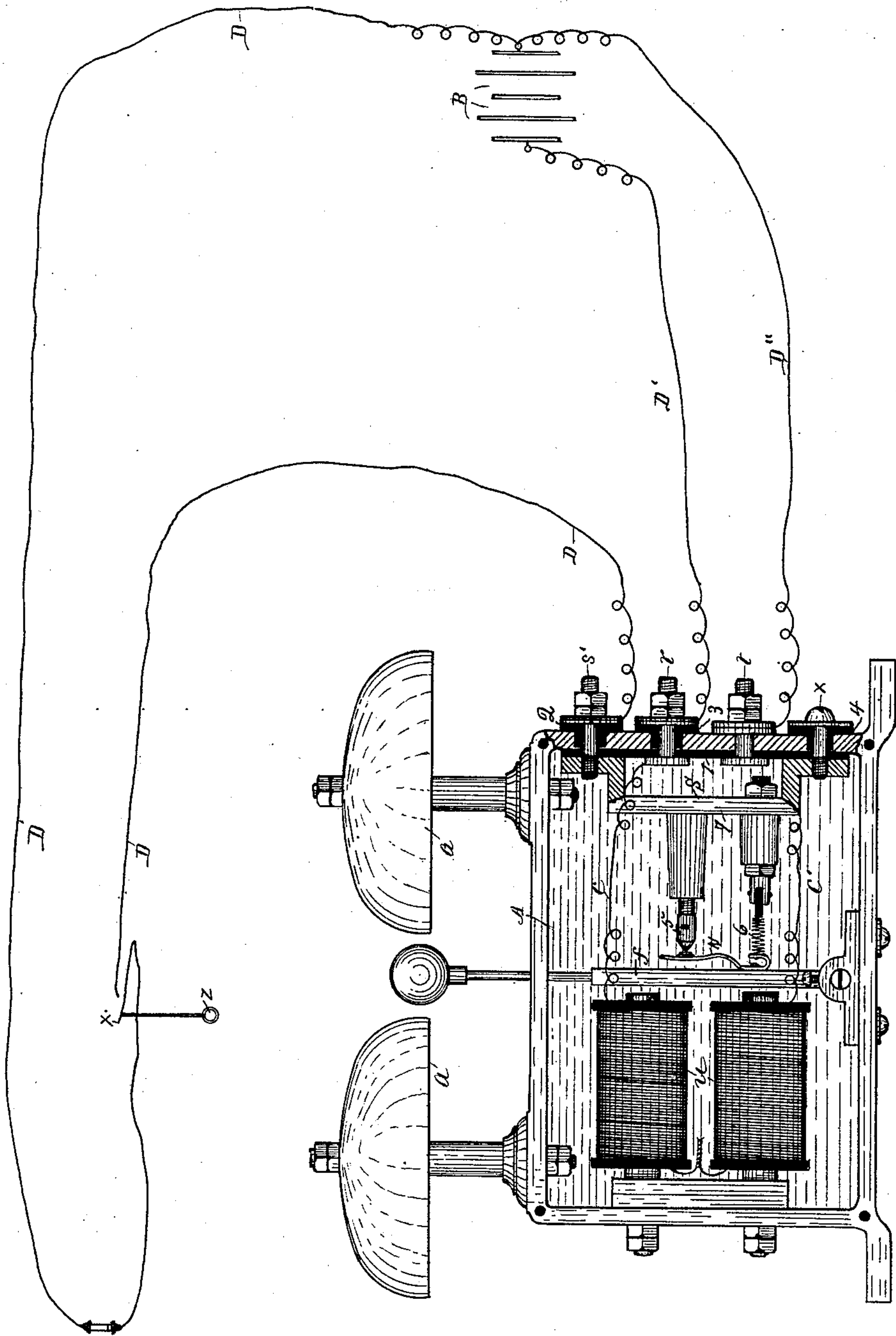


(No Model.)

W. R. COLE.
SIGNALING APPARATUS.

No. 411,120.

Patented Sept. 17, 1889.



Witnesses.

John C. Perkins
Frank M. Brown

Inventor.
William R. Cole
By Lucius C. West
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM R. COLE, OF DETROIT, MICHIGAN.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 411,120, dated September 17, 1889.

Application filed January 4, 1889. Serial No. 295,452. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. COLE, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a new and useful Signaling Apparatus, of which the following is a specification.

This invention relates to that class of electric signaling apparatuses employing two circuits, one of which is broken when desiring to give the signal, and it has for its object certain improvements and novel association of parts especially designing the apparatus for use on railway-trains.

In the drawing forming a part of this specification is shown the signal, battery, and a diagrammatical view of the circuits, one wall of the armature-case being removed and portions at the right broken away.

Referring to the lettered part of the drawing, A is a metal case containing the ordinary magnets *u* and vibratory armature *f*. Upon this case are mounted the bells *a*, between which the bell-clapper of the armature is placed.

At S is a frame having an extended portion 7 and angled or elbow ends attached to the end of the case A on the inside by screw *x* and post *s'*. This frame S, post *s'*, and screw *x* are all insulated from the case A by the insulation 1, 2, and 4.

To the frame S are attached two projections of metal, to one of which the needle 5 is attached and to the other one end of the spring 6 is attached. The other end of the spring 6 is attached to the vibratory armature *f* for the well-known purpose of bringing the end of the spring N in vibrating contact with the needle 5. The spring 6 is of course insulated from the frame S.

One of the magnets *u* is connected with the frame S by the wire *c'*, and the other magnet is connected with the post *r* by the wire *c*. This post *r* is insulated from the case A by the insulation 1 3.

At *t* is a post not insulated from the case A.

It will be observed that the several posts and insulation 1 occupy the whole of one end of the case. This shows one advantage of the frame S having the thrown-out portion for the connection therewith of other parts necessary to have in this end of the case.

At B is shown the battery. When the apparatus is employed on a train of cars, the battery and bell will be located in or near to the engine-cab.

The signaling-circuit D D is extended through the train of cars, and in each car are one or more circuit-breakers in the circuit D. The idea is shown at *z*. By pulling down on the strap *z* the spring *x* will be disconnected from the wire contacting with it, and thus the circuit or line D would be broken, as shown at *x'*; but as the circuit-breaker forms no part of this invention no further explanation relating thereto is necessary.

The direct circuit to battery is shown by lines D' D''. Thus the signal and battery are in both circuits. The circuit through the cars when closed locks the bell from being rung by the jar and shake of the cars, and when the said circuit D is broken the bell is rung by the circuit D' D'' direct from the battery, there then being only one circuit, the circuit D having been destroyed by breaking it. I will now illustrate this by tracing the circuits and noting the results. In the drawing, the circuit D being broken the bell is supposed to be ringing, for the current is now passing through line D'', post *t*, metal case A, spring N, needle 5, metal frame S, wire *c'*, magnets *u*, wire *c*, post *r*, and line D', to battery B.

To stop the bell from ringing, the signaling-circuit D must be closed. The current now will pass through line D, from the battery B, insulated post S', metal frame S, wire *c'*, magnets *u*, wire *c*, post *r*, and line D', to battery B. The effect of this action is to cause the magnets to hold the armature against them, and thus lock the bell.

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

1. In a signal apparatus, the combination of the two circuits and a battery therein, a metal case provided with the signal, an armature and magnets in said case, the metal frame having the thrown-out portion attached to the inside of one wall of the case and insulated therefrom and provided with the projections, the needle attached to one of said projections, and the spring attached at one end to the other projection, insulated there-

from and attached to the armature at the other end, substantially as set forth.

2. The metal case provided with the signal-gong, the magnets and armature in said case, 5 the metal frame attached to one wall of the case and insulated therefrom, the needle and armature-spring attached to said metal frame, a wire attached to one of the magnets and to said frame, a post insulated from the case and 10 frame, a wire connecting the other magnet with said post, a post contacting with the metal case, a battery, a circuit-line direct to the battery from said posts, a post insulated

from the metal case, but contacting with the metal frame, a signaling-circuit line running 15 from said latter-named post to the battery, and a suitable number of circuit-breakers in said circuit, all combined and arranged substantially as set forth.

In testimony of the foregoing I have here- 20 unto subscribed my name in presence of two witnesses.

WILLIAM R. COLE.

Witnesses:

P. M. HULBERT,
J. PAUL MAYER.