E. W. VOGEL.

ELECTROMAGNETIC BELL.

APPLICATION FILED NOV. 10, 1909.

1,091,548.

Patented Mar. 31, 1914.

2 SHEETS—SHEET 1.

Fig. 1

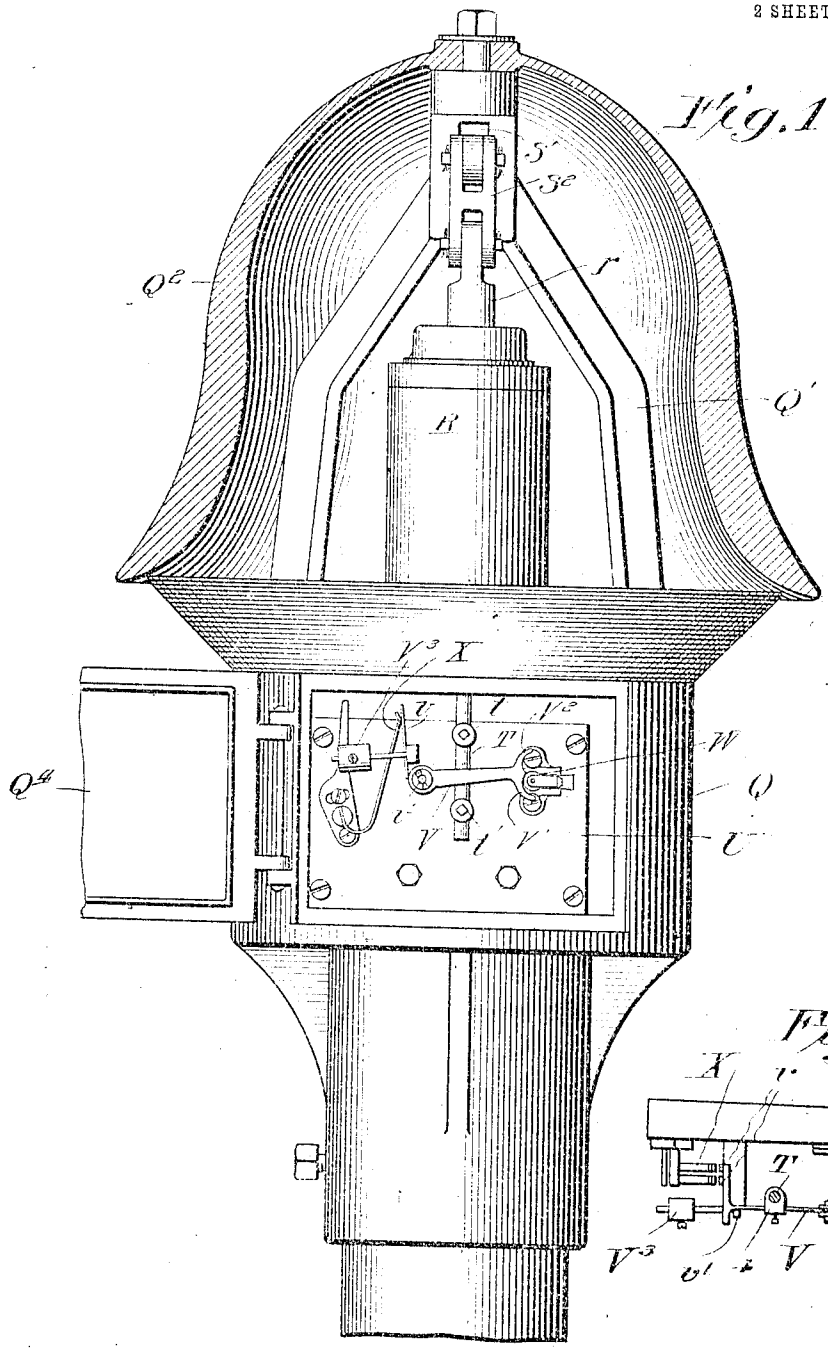

Fig. 3.

Witnesses:

Harry S. Gaither

B. Brandwein

Inventor:

Eugene W. Vogel

By Chamberlin & Prendergast

Attys.

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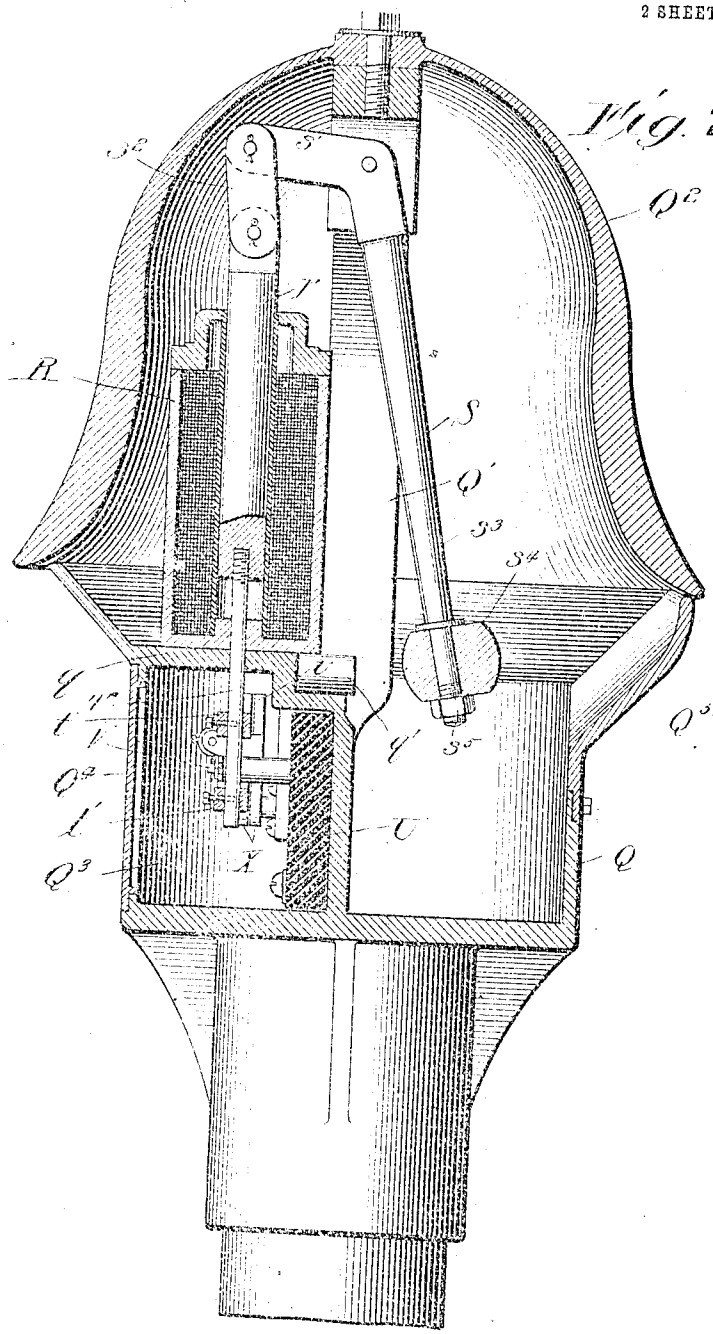
2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

Harry S. Gaither

Alexander.

Inventor:

Eugene W. Vogel

By Chamberlin Brandenburg

Attys.

UNITED STATES PATENT OFFICE.

EUGENE W. VOGEL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE RAILROAD SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ELECTROMAGNETIC BELL.

1,091,548. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed November 10, 1908. Serial No. 527,183.

To all whom it may concern:

Be it known that I, EUGENE W. VOGEL, citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Electromagnetic Bells, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its principal object to provide a powerful electro-magnetic bell which shall require but a small expenditure of power for its operation.

A further object of my invention is to provide an electro-magnetic bell which shall be simple and durable and which will give a loud, clear tone.

A further object of my invention is to provide an electro-magnetic bell which may be used in exposed positions, as at railway stations and crossings without danger of injury to the working mechanism through the entrance of dirt, water or other foreign matter.

A further object of my invention is to provide an electro-magnetic bell in which the parts may readily be inspected and adjusted without removing the gong or bell proper.

A further object of my invention is to provide an electro-magnetic bell wherein the operating mechanism can be housed within the gong or bell proper without making it necessary to remove the latter in order to inspect the operating mechanism and without making it possible for dirt, water or other foreign matter to enter under the usual conditions to which exposed bells are subjected.

A further object of my invention is to provide a simple and novel arrangement for securing accurate adjustments of the controlling mechanism in such bells.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its various objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a side view of a bell mechanism arranged in accordance with my invention, the door being open, and the bell being in section; Fig. 2 is a central vertical section taken at right angles to the plane of Fig. 1; and Fig. 3 is a detail of a portion of the automatic switch mechanism.

I have shown an embodiment of my invention wherein the bell is in the form of an ordinary locomotive bell.

Referring to the drawing Q represents the casing or housing which is partially open at the top and provided with an upwardly-projecting post Q^1 on which the bell Q^2 is mounted.

R is an electromagnet vertically arranged upon the top wall q of the closed compartment Q^3 of the housing. The compartment Q^3 is adapted to be closed by a door Q^4.

S is the striker which consists of a bell crank lever pivoted at its elbow upon the post Q^1. The short arm s^1 of the bell crank lever is connected to the plunger r of the electromagnet by means of a link s^2. At the lower end of the long arm s^3 of the lever is a striking member s^4; this being conveniently in the form of an eccentric ball which is slipped upon the end of the lever arm and held in place by means of a nut s^5. It will be seen that by changing the angular position of the ball upon the lever the point at which it will strike the bell may be varied.

q' is a buffer of rubber or other elastic material against which the ball s^4 may strike when it rebounds from the bell.

T is a rod which projects from the lower end of the plunger of the magnet through the wall q and into the compartment Q^3.

U is a slab of insulating material mounted in the compartment Q^3 at one side of the rod T and on this slab is pivotally supported a movable switch member V having a contact finger v. The pivot v^1 of the movable switch member is arranged at right angles to the rod T. At one end of the member V is a double cam head comprising cams V^1 and V^2 and at the other end is a counter weight V^3.

W is a spring-pressed roller coöperating with the cams V^1 and V^2.

X is a contact finger adapted to coöperate

with the finger or contact device v. The rod T is provided with two separated laterally-projecting buttons t and t^1 which respectively overlie and underlie the member V.

Normally the parts occupy the positions indicated in Figs. 1 and 2. If current is supplied to the contact X, the magnet will become energized and the plunger will be drawn down, the button t striking against the upper edge of the member V and forcing it down until the roller W engages with the cam V^2. In this position of the parts the circuit is broken at the contacts X and v and the magnet becomes deënergized. As soon as this happens the striker drops back until it engages with the buffer q^1, raising the plunger of the magnet and the rod T until the button t^1 engages with the underside of the member V and lifts this member sufficiently to bring the cam V^1 into operative relation with the roller as indicated in Fig. 1. It will be seen that the counterweight V^3 slightly overbalances the member V so as to assist the device W in holding the contacts v^x together when the parts are in the positions indicated in Fig. 1. The clapper and the plunger partially counterbalance each other so that the clapper will rebound from the buffer and will oscillate back and forth until it comes to rest approximately in the position indicated, in which position the member V is clear of both of the buttons t and t^1. This oscillating of the clapper until it finds its position of rest occurs only, of course, in case the current is shut off for, if current continues to be supplied, the magnet will be energized again as soon as the switch returns to the position indicated and the plunger will again be drawn downwardly in the manner previously described. In this construction, the parts are so proportioned that the plunger substantially completes its working stroke before the switch is actuated, so that the full power of the magnet is utilized to drive the clapper against the bell. Furthermore, the make and break is effected quickly and the final movement of the movable switch member is brought about automatically after the member V has passed the center. Furthermore, the clapper and the plunger partially counterbalance each other so that the clapper responds quickly when power is applied and will accomplish its work with the expenditure of only a small amount of electrical energy. Furthermore, all of the parts are inclosed so that there is no danger of disarrangement of the mechanism through the entrance of foreign matter. It will be seen that the only parts which require adjustment are the switch mechanism and the ball of the clapper. The switch mechanism is all inclosed within a sealed compartment to which access may be obtained by opening the door Q^4 and the position of the ball on the lower end of the clapper arm may be adjusted through an auxiliary closure by a door Q^5.

While I have described in detail only a single preferred embodiment of my invention, I do not desire to be limited to this particular embodiment, but intend to cover all forms and constructions which fall within the terms employed in the definitions of my invention which constitute the appended claims.

What I claim is:

1. In an electromagnetic bell, an electromagnet, a movable gravity-returned armature for said magnet, a bell-striking member connected to said armature and gravity-actuated in one direction, a controlling circuit for said magnet, a switch in said circuit, said switch having a movable switch arm, a device for completing the movement of said switch arm in either direction after it has been moved a predetermined distance in such direction, and then holding the arm in the position into which it has been moved, and shoulders on said armature and lying on opposite sides of said arm and in position to engage therewith for causing said arm to be actuated in both directions by the armature.

2. In an electromagnetic bell, electromagnetic ringing mechanism including a movable armature, a controlling switch having a movable arm, a spring-pressed member for carrying said arm in either direction after it has been moved a predetermined distance in that direction, and coöperating shoulders on said armature and on said arm for causing the arm to be actuated by the armature.

3. In an electromagnetic bell, an electromagnet, a movable armature for said electromagnet, a switch arm, a yielding holding member for said arm, coöperating cam faces on said member and on said arm for enabling said member to continue the movement of said arm in either direction after it has been brought to a predetermined point, and coöperating shoulders on said armature to actuate the arm.

4. In an electromagnetic bell, an electromagnet having a vertically movable core, a bell striker mounted so as to be capable of swinging about a horizontal axis, a connection between the striker and the said core, a controlling switch for said electromagnet lying beneath the same, a rod extending downwardly from said core, said switch having an arm extending past said rod, shoulders on said rod above and below said arm in positions to engage with the arm when the core moves up and down, and means associated with said arm to complete

its movement in either direction after it has been moved a predetermined distance in that direction by one of the shoulders.

5. In an electromagnetic bell, a bell striker, an electromagnet having a vertically movable core, a connection between said striker and said core, a rod depending from said core, a controlling switch having an arm extending past and in proximity to said rod, shoulders on said rod above and below said arm, and means associated with said arm for throwing it out of engagement with either of said shoulders after it has been moved a predetermined distance by that shoulder.

6. In an electromagnetic bell apparatus, a bell open at the bottom, a casing lying below the bell and closing the mouth thereof, a post extending up from the casing into the bell, means for securing the top of the bell to the top of the post, a bell striker mounted on said post, and automatic actuating mechanism for said striker carried by said casing.

7. In an electromagnetic bell apparatus, a bell open at the bottom, a casing lying below the bell and closing the mouth thereof, a post extending up from the casing into the bell, means for securing the top of the bell to the top of the post, said casing being divided into two compartments one of which is closed at the top and the other of which is open at the top, a bell striker mounted on the post and movable in the top of the open compartment, an actuating magnet for the striker mounted on top of the closed compartment.

8. In an electromagnetic bell apparatus, a bell open at the bottom, a casing lying below the bell and closing the mouth thereof, a post extending up from the casing into the bell, means for securing the top of the bell to the top of the post, said casing being divided into two compartments one of which is closed at the top and the other of which is open at the top, a bell striker mounted on the post and movable in the top of the open compartment, an actuating magnet for the striker mounted on top of the closed compartment, switch mechanism in said closed compartment, a connection between said magnet and said switch mechanism, and a door in said closed compartment for giving access to the switch mechanism.

In testimony whereof, I sign this specification in the presence of two witnesses.

EUGENE W. VOGEL.

Witnesses:
WM. F. FREUDENREICH,
BRICEND SWEET.