(No Model.)

L. C. SMITH.

ELECTRIC SIGNAL FOR RAILWAY CROSSINGS.

No. 604,431. Patented May 24, 1898.

FIG. 4

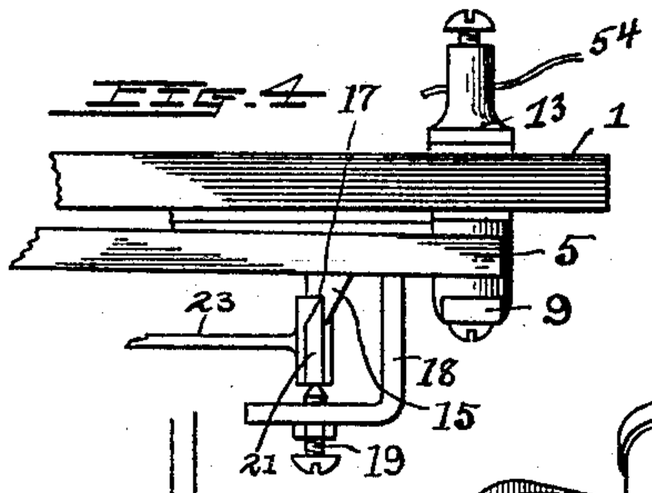


FIG. 3

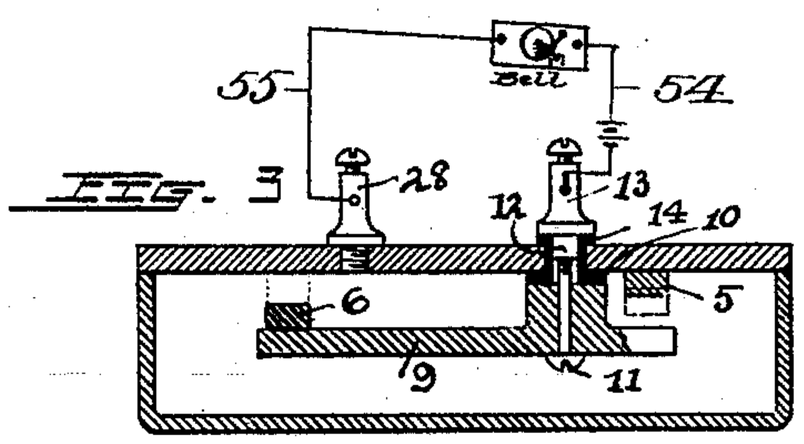


FIG. 2

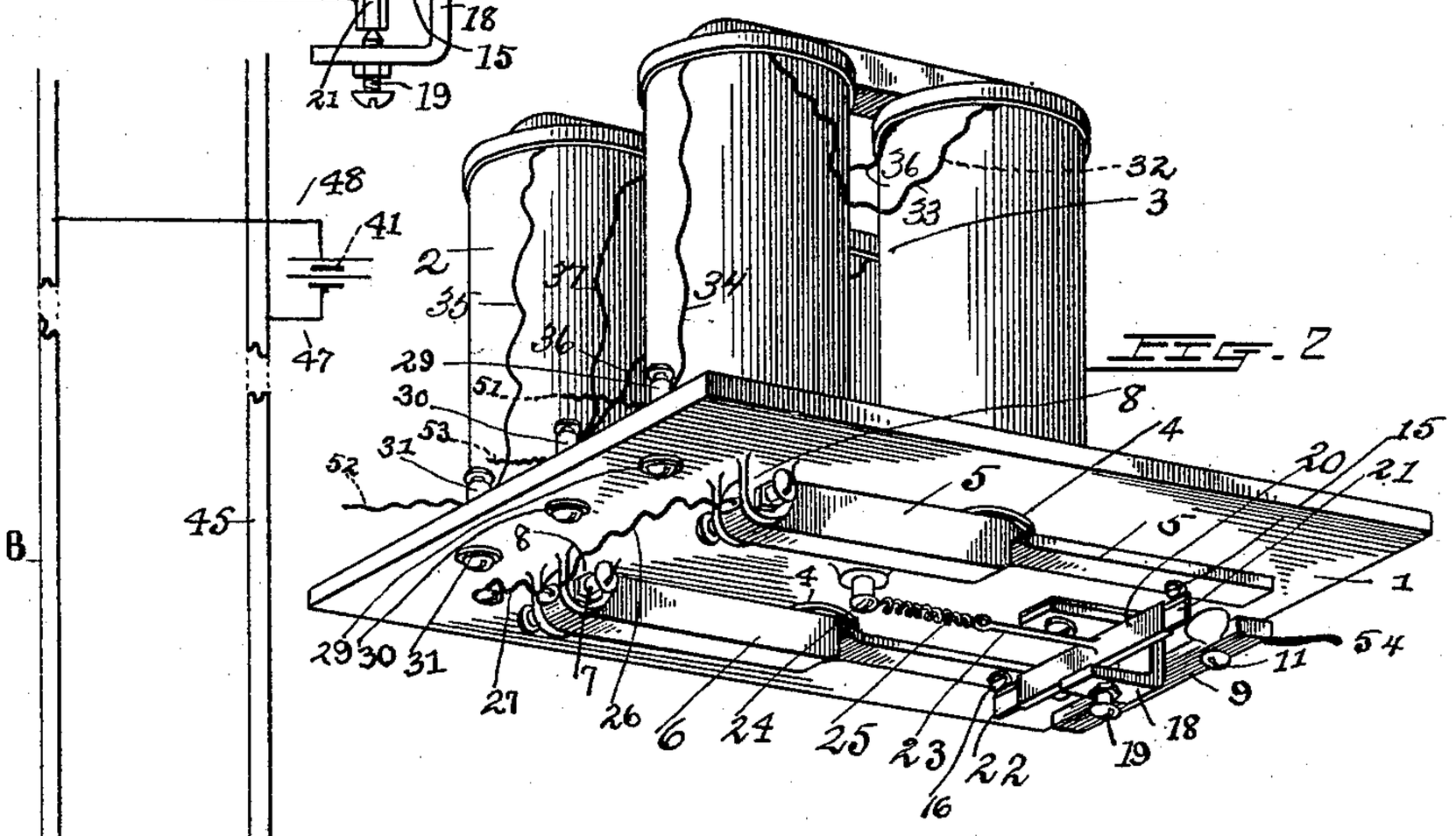


FIG. 1

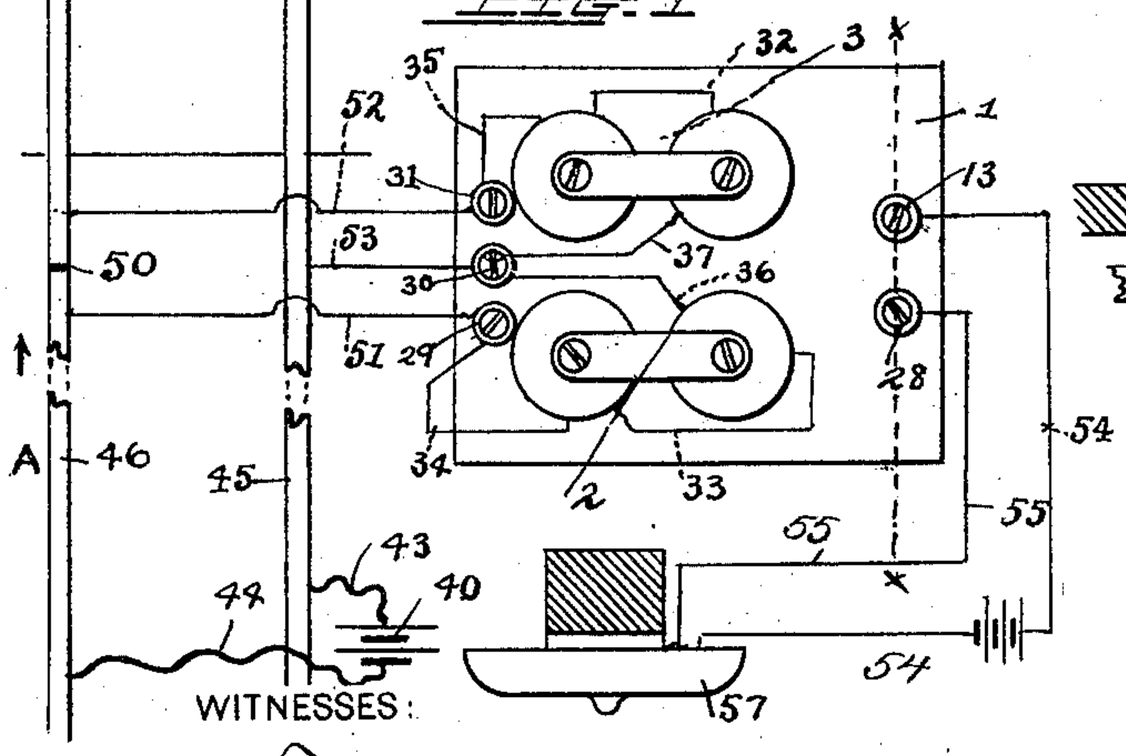
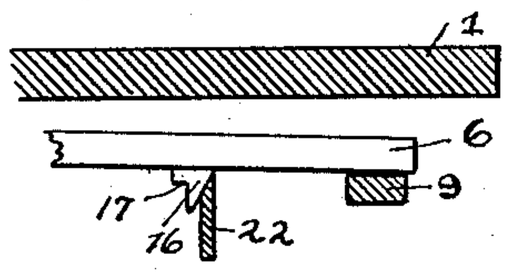


FIG. 5



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LEON C. SMITH, OF COLUMBUS, OHIO.

ELECTRIC SIGNAL FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 604,431, dated May 24, 1898.

Application filed May 18, 1897. Serial No. 637,120. (No model.)

To all whom it may concern:

Be it known that I, LEON C. SMITH, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Electric Signals for Railway-Crossings, of which the following is a specification.

My invention relates to the improvement of electric signaling devices for railways, and has particular relation to that class of signaling devices by means of which danger-signaling bells are automatically rung where roadways or streets cross railway-tracks.

The objects of my invention are to provide an improved electrical mechanism of this character of such construction and arrangement of parts as to result in the automatic ringing of an alarm-bell as the train approaches a crossing from either direction, to so construct and arrange the parts of my device as to prevent the ringing of such alarm-bell after the roadway has been crossed, and to produce other improvements in details of construction and arrangement of parts, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a railway-track and road-crossing, showing the connections of the rails with my device. Fig. 2 is a perspective view of my improved signal-operating mechanism. Fig. 3 is a transverse section taken on line *x x* of Fig. 1 and enlarged therefrom. Fig. 4 is a partial side elevation of portions of my device enlarged from that shown in Fig. 2 and showing the position of one of the armature-bars immediately after the train has crossed the roadway; and Fig. 5 is an enlarged sectional view taken transversely through one of the blade extensions (hereinafter numbered 22) of the armature cut-out bar, showing the position of the remaining or opposite armature-bar until the rear end of the train has reached the crossing.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a magnet base-plate 1, and upon the upper side of the latter I support two double-spool magnets 2 and 3, the cores 4 of said magnets projecting, as indicated in Figs. 2 and 3, through the plate 1. Beneath each magnet formed as above described and on the under side of the plate 1 I provide an armature-bar, the latter being indicated, respectively, at 5 and 6 and the rear ends of these bars being fulcrumed at points 7 to lugs or arms 8, which depend from the under side of the plate 1. Supported transversely beneath what I shall term the "forward end" portion of the base-plate is a contact-bar 9, the latter being provided with an upwardly-extending boss, which, although insulated, as indicated at 10, from the said plate 1, is made to depend therefrom through the medium of a screw 11, which passes upwardly into the downwardly-extending stem 12 of a binding-post 13, which projects from the upper side of the plate 1. As indicated at 14, this binding-post is also insulated from said plate. The end portions of the contact-bar 9 are so located as to normally receive the forward ends of the armature-bars 5 and 6. At oppositely-located points on the under sides of the forward portions of the armature-bars 5 and 6 I provide downwardly-extending stop projections, which are indicated, respectively, at 15 and 16. As shown in the drawings, these stop projections have their forward faces beveled, resulting in imparting to each of said stops a substantially tooth-shaped form, and each of the stops is recessed on its rear side to form a shoulder 17.

Depending from a point midway between the forward portions of the armature-bars and in rear of the contact-bar 9 is a hanger or arm 18, which is preferably of the reversed-L shape shown. Through the lower horizontal portion of the arm 18 passes an adjustable pivot-screw 19, upon the upper end portion of which is pivoted centrally an armature-regulating or cut-out bar 20. At each end the bar 20 terminates in a blade extension, these blade extensions having their upper edges beveled, as indicated in the drawings, and being indicated, respectively, at 21 and 22.

The regulating or cut-out bar 20 is normally retained in its proper horizontal position by means of a rod 23, which extends rear-

wardly from the center of said bar 20 and has its rear end connected with a plate-post 24, through a coil-spring 25.

The rear end portions of the armature-bars 5 and 6 are connected by a wire 26, while the bar 6 is further connected with the plate 1 through a wire 27.

Upon the forward end portion of the plate, near the post 13, I provide a binding-post 28, which is connected with the plate 1, and upon the rear portion of the plate 1 I provide three binding-posts, which are indicated, respectively, at 29, 30, and 31.

As indicated more clearly in Fig. 1 of the drawings, the spools of each magnet are suitably connected by wires 32 and 33, while the outer binding-posts 29 and 31 are connected with the magnets 2 and 3 through wires 34 and 35. The central binding-post 30 is connected, through wires 36 and 37, with the forward spools of the magnets 2 and 3.

In arranging a railway-track adjacent to a street or road-crossing for use in connection with my device I provide batteries 40 and 41, arranged, respectively, at points on opposite sides of the road-crossing, which is indicated at 42. These batteries are preferably located near the usual whistling-posts. Through the medium of wires 43 and 44 the poles of the battery 40 are connected, respectively, with the track-rails 45 and 46, while on the opposite side of the crossing the battery 41 is similarly connected with said rails through wires 47 and 48.

At a suitable point, preferably adjacent to the roadway 42, is located the magnet-supporting plate 1 and its connecting parts. At a point 50 on one side of the roadway and adjacent thereto the track-rail 46 is separated by a suitable insulation, thus separating said rail into two sections, which I have indicated at A and B. On opposite sides of the insulating-point 50 the rail-sections A and B are connected, respectively, with the binding-posts 29 and 31 by wires 51 and 52, while the binding-post 30 is connected with the rail 45 by a wire 53. The binding-posts 13 and 28 are, through the medium of wires 54 and 55, connected through a battery and bell 56 and 57. The rail-sections forming the track-rail 45 between the batteries 40 and 41 are electrically bonded together, while the sections of the track-rail 46 are bonded together on each side of the insulating-point 50.

It is obvious that through the connections above described a closed circuit is normally maintained between the track-rails, the track-batteries, and the magnets and that the armature-bars 5 and 6 are normally drawn upward in contact with the magnet-cores, as indicated in Fig. 2 of the drawings. In these positions it is evident that the armature-bars will be normally raised above and out of connection with the contact-bar 9.

In order to illustrate the operation of my device, we will assume that a train is approaching the crossing in the direction of the arrow in Fig. 1. The wheels of the engine having passed the connecting-points of the battery-wires 43 and 44 with the rails, it is obvious that through the passing of the current through the wheels and engine-axles a short-circuiting of the current previously established through the battery 40, rail-section A, and magnet 2 will occur, which will result in dropping the armature-bar 5 into contact with the bar 9. Through this contact of the bars 9 and 5, the connection of the post 13 with the bell, and the connection of the plate-post 28 through the battery 56 and said bell a circuit is closed through the latter, resulting in a constant ringing until the last car of the train has passed the insulation-point 50. This having been accomplished it is obvious that the current will be reëstablished through the magnet 2 and the armature-bar 5 again raised in contact with the magnet-cores. As soon as the engine and forward cars of the train have passed the crossing or point of connection of the wires 53 and 52 with the rails it is evident that the short-circuiting of the current through the battery 41 will occur, resulting in the demagnetization of the magnet 1 and in a dropping of the armature-bar 6. In thus dropping, however, the end of the armature-bar 6 is prevented from contact with the bar 9 through the contact of the beveled upper edge of the blade 22 with the shoulder 17 of the stop projection 15 of said armature-bar, thus preventing a ringing of the alarm-bell after the train has passed the crossing. As soon as the last car of the train going in the direction of the arrow has passed the points of connection of the wires 47 and 48 with the track-rails it is obvious that the normally-closed circuit will be restored through the magnets and that both armature-bars will be drawn upward thereby and out of contact with the bell-bar 9. Before the train reaches the crossing and between the battery 40 and the crossing the inclined face of the stop projection 15 of the bar 5 is in contact with the beveled upper edge portion of the blade 21, which results not only in the two beveled surfaces sliding together and admitting of the falling of the bar 5, but also results in so turning the bar 21 on its pivot as to cause the blade 22 to come into contact with the shoulder of the opposite stop 16 instead of with the beveled face thereof.

In case a train is approaching the crossing in the direction opposite from that above described it is evident that the circuit through the battery 41, rail-section B, rail 45, and magnet 3 will be short-circuited, with the result that the armature-bar 6 will drop to the position indicated in Fig. 5 of the drawings, the blade 22 bearing against the inclined side of the stop 16 and admitting of the contact of the bars 6 and 9 and resulting in a ringing of the alarm-bell. The operation of preventing the ringing of the bell after the train has passed the crossing is substantially the same as that heretofore described.

Although I have shown and described my invention as applicable to a closed circuit, it is obvious that the same mechanism might be employed for use in connection with an open circuit by so changing the positions of the magnets and armature-bars as to draw said armature-bars downward only when a circuit is established through the magnets by a contact of the car-wheels with the track-rails. In this case it is obvious that the batteries 41 and 40 would necessarily be moved to a position adjacent to the roadway.

From the construction and operation herein disclosed it will be seen that simple, reliable, and effective means are provided for the ringing of an alarm-bell as a train approaches a crossing and that improved means are provided in conjunction therewith for preventing the ringing of such alarm-bell after the train has passed the crossing. It will also be seen that my improved mechanism may be constructed and put into use at a comparatively low cost and that the same is of such construction as to obviate any tendency toward getting out of order.

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

In an automatic electric railway-signal for crossings, the combination with two sets of magnet-spools 1 and 2, armature-bars 5 and 6, oppositely-located stop projections 15 and 16 on said bars, each of said stop projections having one of its faces inclined and its remaining face provided with a shoulder as described, of a cut-out bar pivoted between said armature-bars, the ends of said cut-out bar being adapted when said armature-bars are moved toward them to come into contact respectively with the inclined faces and shoulders of said stops, a bell-contact bar with which said armature-bars are adapted to come into contact, and connections substantially as described whereby circuits may be established through the magnets 1 and 2 with the track-rails on opposite sides of the crossing, substantially as and for the purpose specified.

LEON C. SMITH.

In presence of—
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A. L. PHELPS.