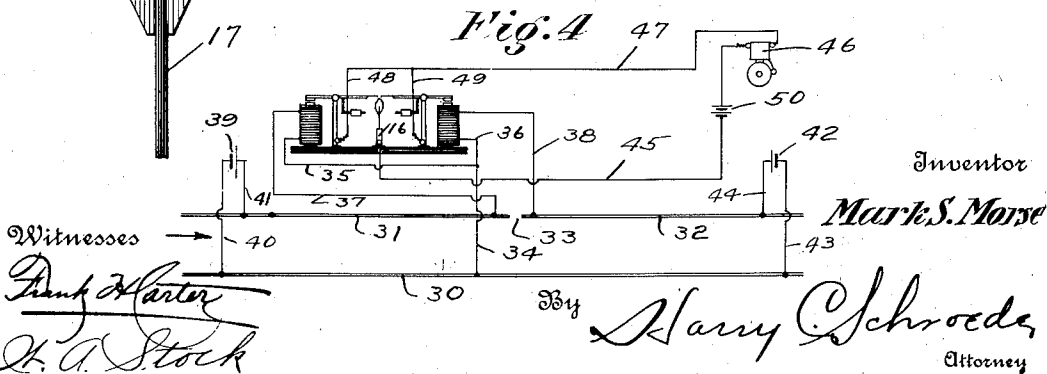
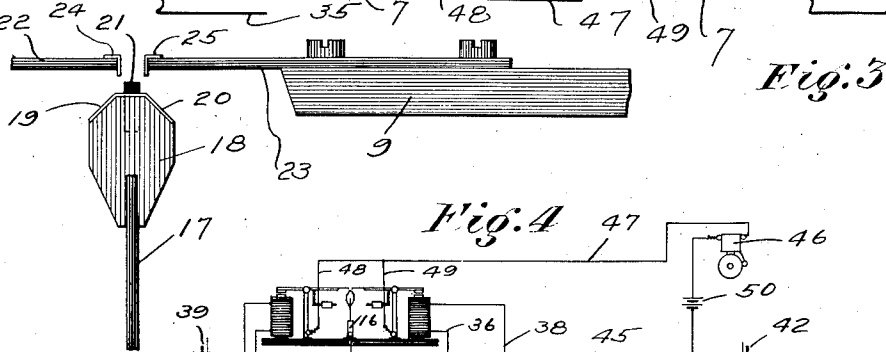
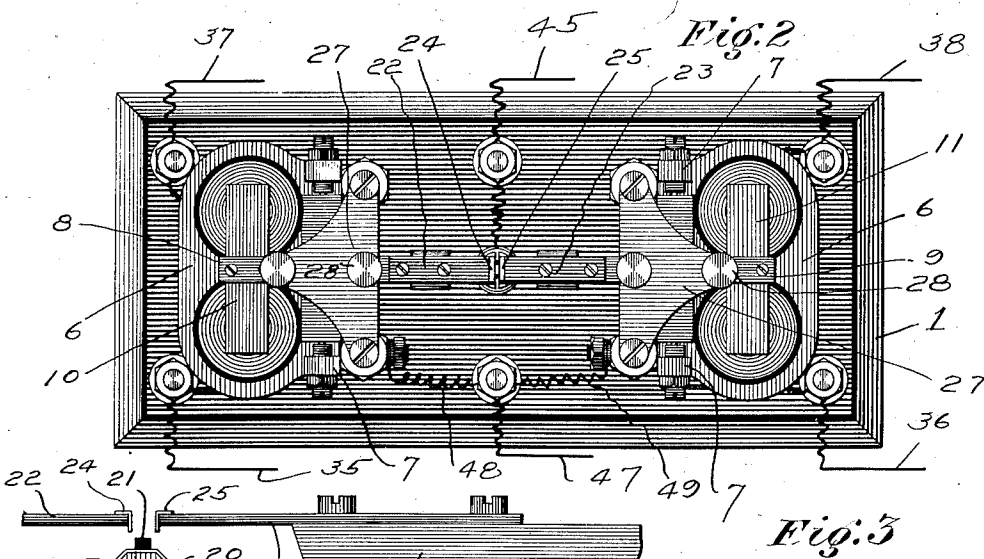
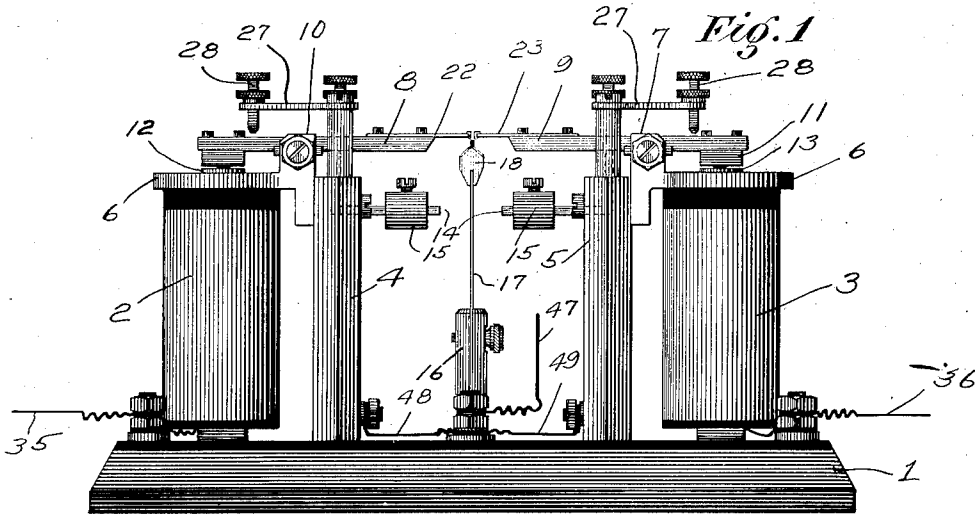


M. S. MORSE.
RELAY.
APPLICATION FILED AUG. 22, 1912.

1,092,283.

Patented Apr. 7, 1914.



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RELAY.

1,092,283.

Specification of Letters Patent.

Patented Apr. 7, 1914.

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To all whom it may concern:

Be it known that I, MARK S. MORSE, citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Relays, of which the following is a specification.

My present invention relates to relays, and more particularly to that class of devices which are adapted to control audible or visible signals at railroad crossings, to give warning of an approaching train.

The principal object of my invention is to provide an improved relay to be used in an appropriate system, which is simple in construction, efficient in action and maintained in working condition for a considerable length of time with little or no expense.

Other objects of my invention will appear in the specification, in connection with the accompanying drawing, forming a part thereof, and in which drawing:

Figure 1 is a side elevation of a relay embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a fragmentary detailed elevation of movable contacts used in connection with the relay. Fig. 4 is a diagrammatic view showing the signal system embodying my invention.

Similar characters refer to similar parts throughout the views.

The relay used in connection with the signal system is conveniently mounted upon a base 1, of slate, fiber, or other insulating material, and carries two electromagnets 2 and 3. Standards 4 and 5 are disposed adjacent the electromagnets 2 and 3, respectively, preferably intermediate the two, these standards carrying frames 6 provided with bearings 7. The standard 4 carries an oscillatable arm 8, through the bearings 7 on its frame 6, while the standard 5 similarly carries an oscillatable arm 9. The arms 8 and 9 carry armatures 10 and 11, respectively, at one side of their respective pivot points, such armatures coacting with the cores 12 and 13 of the electromagnets 2 and 3, respectively. With the electromagnets energized, these arms are held in a predetermined position by the influence of the magnets upon the armatures, however, each arm is provided with an angular extension 14 disposed at the side of its respective arm opposite from the armature thereof, and this extension carries a weight 15, adjustable upon the extension so that the arm is actu-

ated to swing about its pivot point by the force of gravity when the armature is not attracted. It is to be understood that any well known equivalent device may be used to actuate the arm from the position determined by energy of the electromagnets, the adjustable feature being desirable inasmuch as the relay may thus be finally adjusted to most efficiently serve its purpose in the system.

The base 1, preferably intermediate the standards 4 and 5, carries a post 16 from which projects a spring conductor 17 carrying a head 18 having bevel platinum facings 19 and 20, converging away from the spring 17. Intermediate the facings 19 and 20, in the axis of convergence thereof, is an insulation abutment 21.

The arms 8 and 9 carry spring extensions 22 and 23, respectively, at the ends opposite from armatures 10 and 11, respectively, these spring extensions projecting in close proximity to head 18, as clearly shown in Fig. 3 of the drawing. The extensions 22 and 23 carry hooked platinum contacts 24 and 25, respectively, to act upon the faces 19 and 20, respectively, or the abutment 21, as hereinafter described, when the arms by which they are carried are actuated by means of weight 15.

To limit movement of the arms 8 and 9, responsive to weight 15, the standards carry plates 27, each provided with a set screw 28, as clearly shown in Fig. 1 of the drawing, preferably acting as an abutment upon the arm projection carrying the armatures.

It is to be noted that when one of the arms 8 or 9 is free to move responsive to the weight 15, or its equivalent, such movement of the arm brings the contact at the end of extensions 22 or 23, into sliding engagement with one of the facings 19 or 20, of head 18, and forces said head toward the arm held under the influence of its respective energized electromagnet. Should the last mentioned arm be free to move responsive to weight 15, then the hooked contact would engage over the abutment 21, but not contact with either facing 19 or 20 of the head, and even though the arm which caused displacement of said head be returned to a position out of contact with the facings of the head, such other arm will still retain the head from assuming a normal position, by its hooked contact about the abutment 21. This condition would exist until the last considered arm has been actuated by the energy of

the electromagnet in operative relation thereto.

Referring now more particularly to Fig. 4 of the drawing, 30 designates one of the rail sections of a track; 31 and 32, complementary rail sections to rail 30, in the track; an insulating joint 33 being interposed between rail sections 31 and 32, along the track, where it is desired to render the signal inactive, as hereinafter described. Rail section 30 is electrically connected with the electromagnets 2 and 3, by main conductor 34 and branches 35 and 36, leading to the coils of the electromagnets 2 and 3, respectively. Rail section 31 is electrically connected through conductor 37 with the other end of the coil of electromagnet 2, and rail section 32 similarly connected with electromagnet 3 by conductor 38. Electromagnet 2 is energized by an electric generator 39, such as a gravity battery, one pole of which, through conductor 40, is electrically connected to rail section 30 and the other pole, through conductor 41, similarly connected with rail section 31. Electromagnet 3 is similarly energized by an electric generator 42, the poles of which are conductively connected by conductors 43 and 44, with the rail sections 30 and 32, respectively. Thus, when a current is completed through conductors 36 and 38, or 35 and 37, the electromagnets 2 and 3 are energized and the arms 8 and 9 held in a position with their contacts out of contact with the facings of head 18.

The post 16, through conductor 45 is electrically connected with an electrically operated signal 46, such as an alarm, while the circuit through the device 46 is conducted by conductor 47 to hooked contacts 24 and 25, by branch wires 48 and 49, respectively, operatively connected with said contact. An electric generator 50 is disposed in either conductor leading to the device 46; in the drawing, it being shown disposed in conductor 45.

It will be understood that while I have shown and described the preferred form of my invention I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:—

1. In a relay for signal systems, the combination of two electromagnets adapted to be independently energized, an armature for each electromagnet to move to or from the core thereof, a head having two converging faces of conducting material, a mounting for said head adapted to hold the same in a predetermined normal position but whereby the head is movable laterally of said position, an insulation abutment between said converging facings of said head, a hook contact for each of said armatures one disposed in close proximity to each of said faces of said head and adapted to be actuated by

movement of its respective armature to make or break contact with the respective facing of said head, the first hooked contact actuated to make contact with the facing of said head forcing the latter laterally to position the other facing thereof out of operative relation to the other contact and disposing said abutment in the path of movement of said last mentioned contact.

2. In a relay for signal systems, the combination of two electromagnets adapted to be independently energized, an armature for each electromagnet to move to or from the core thereof, an oscillatable head provided with two converging faces of conducting material, an insulation abutment between said converging faces of said head, two oscillatable arms one adjacent each electromagnet, said magnets each being adapted to actuate a corresponding arm upon energization of its respective magnet, means for actuating each arm in a counter direction to that resulting from energy of its respective magnet, a hooked contact for each of said arms one disposed in close proximity to each of said faces of said head and adapted to be actuated by movement of its respective arm to make or break contact with the respective face of said head, the first hooked contact actuated to make contact with the facing of said head forcing the latter laterally to position the other facing thereof out of operative relation to the other hooked contact and disposing said abutment in the path of movement of said last mentioned hooked contact.

3. In a relay for signal systems, the combination of two electromagnets adapted to be independently energized, an armature for each electromagnet, to be moved to or from the core thereof, an oscillatable head provided with two converging faces of conducting material, an insulation abutment between said converging faces of said head, two oscillatable arms one adjacent each electromagnet, said magnets each being adapted to actuate a corresponding arm upon energization of its respective magnet, an extension carried by said arms at the opposite sides thereof from the pivot point, from said armatures, a weight adjustable upon each of said extensions, a hooked contact for each of said arms one disposed in close proximity to each of said faces of said head and adapted to be actuated by movement of its respective arm to make or break contact with the respective face of said head, the first hooked contact actuated to make contact with the facing of said head forcing the latter laterally to position the other facing out of operative relation to the other hooked contact and disposing said abutment in the path of movement of said last mentioned hooked contact.

4. In a relay for signal systems, the com-

5 bination of two electromagnets adapted to
 be independently energized, an armature for
 each electromagnet to be moved to or from
 the cores thereof, an oscillatable head pro-
 10 vided with two converging faces of conduct-
 ing material, an insulation abutment be-
 tween said converging faces of said head,
 two oscillatable arms one adjacent each elec-
 15 tromagnet, said magnets each being adapt-
 ed to actuate a corresponding arm upon
 energization of its respective magnet, means
 for actuating each arm in a counter direc-
 20 tion to that resulting from energy of its re-
 spective magnet, means for limiting move-
 ment of said arms responsive to said last
 mentioned means, a hooked contact for each
 of said arms one disposed in close proxim-
 25 ity to each of said faces of said head, and
 adapted to be actuated by movement of its
 respective arm to make or break contact with
 the respective face of said head, the first
 hooked contact actuated to make contact
 30 with the face of said head forcing the latter
 laterally to position the other face thereof
 out of operative relation to the other hooked
 contact and disposing said abutment in the
 path of movement of said last mentioned
 hooked contact.

35 5. In a relay for signal systems, the com-
 bination of two electromagnets adapted to
 be independently energized, an armature for
 each electromagnet to be moved to or from
 the cores thereof, a flexible spring, a head
 carried by said spring and provided with
 40 two converging faces of conducting mate-
 rial, an insulation abutment between said
 converging faces of said head, two oscillat-
 able arms one adjacent each electromagnet,
 said magnets each being adapted to actuate
 45 a corresponding arm upon energization of
 its respective magnet, means for actuating
 each arm in a counter direction to that re-
 sulting from energy of its respective magnet,

a hooked contact of each of said arms one
 disposed in close proximity to each of said
 45 faces of said head and adapted to be actu-
 ated by movement of its respective arm to
 make or break contact with the respective
 face of said head, the first hooked contact
 actuated to make contact with the faces of
 50 said head, forcing the latter laterally to po-
 sition the other face thereof out of opera-
 tive relation with the other hooked contact
 and disposing said abutment in the path
 of movement of said last mentioned hooked
 55 contact.

6. In a relay for signal systems, the com-
 bination of a hand movable laterally of a
 predetermined point and provided with two
 converging conducting faces, an insulation
 60 abutment between said faces of said head, a
 hooked contact having a path of movement
 crosswise one of said faces of said head, but
 normally out of contact therewith, and
 adapted to move the head out of a normal
 65 position by contact with said face, a second
 hooked contact having a path of movement
 crosswise the other face of said head, but
 normally out of contact therewith, and
 adapted to move the head out of normal po-
 70 sition by contact with said face, movement
 of said head responsive to movement of one
 of said hooked contacts out of the normal
 positioning said insulation abutment in the
 path of movement of the other hooked con-
 75 tact, so that movement of said last men-
 tioned hooked contact from the normal po-
 sitions the hook to prevent return movement
 of the head to a normal position.

In testimony whereof I affix my signa- 80
 ture in presence of two witnesses.

MARK S. MORSE.

Witnesses:

M. M. ESCHERICH,
 W. A. STOCK.