W. A. HESSE & P. G. SANBORN.

CROSSING SIGNAL.

APPLICATION FILED NOV. 18, 1914.

1,234,664.

Patented July 24, 1917.

4 SHEETS—SHEET 1.

Fig. 1.

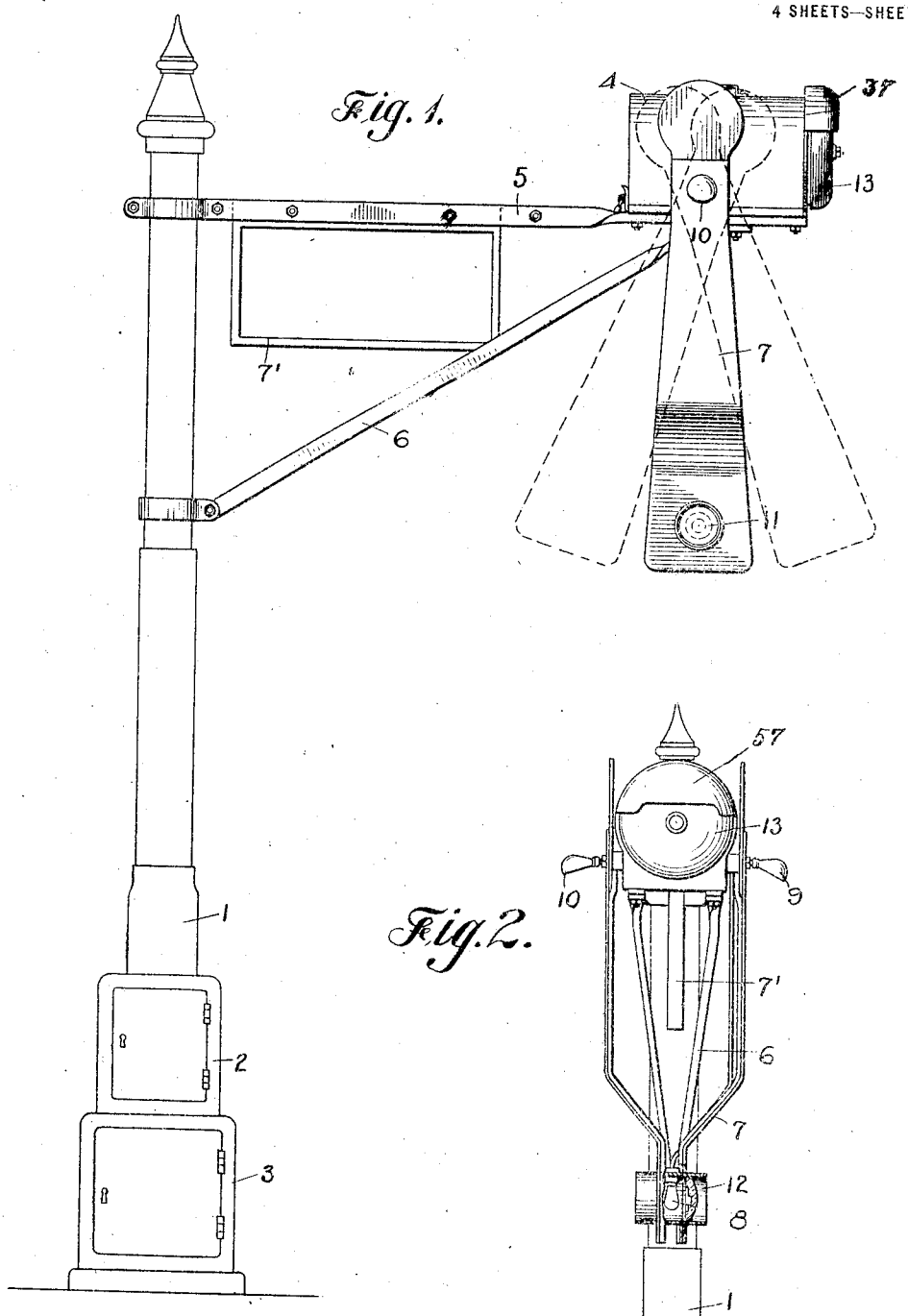


Fig. 2.

WITNESSES

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4 SHEETS—SHEET 2.

Fig. 4.

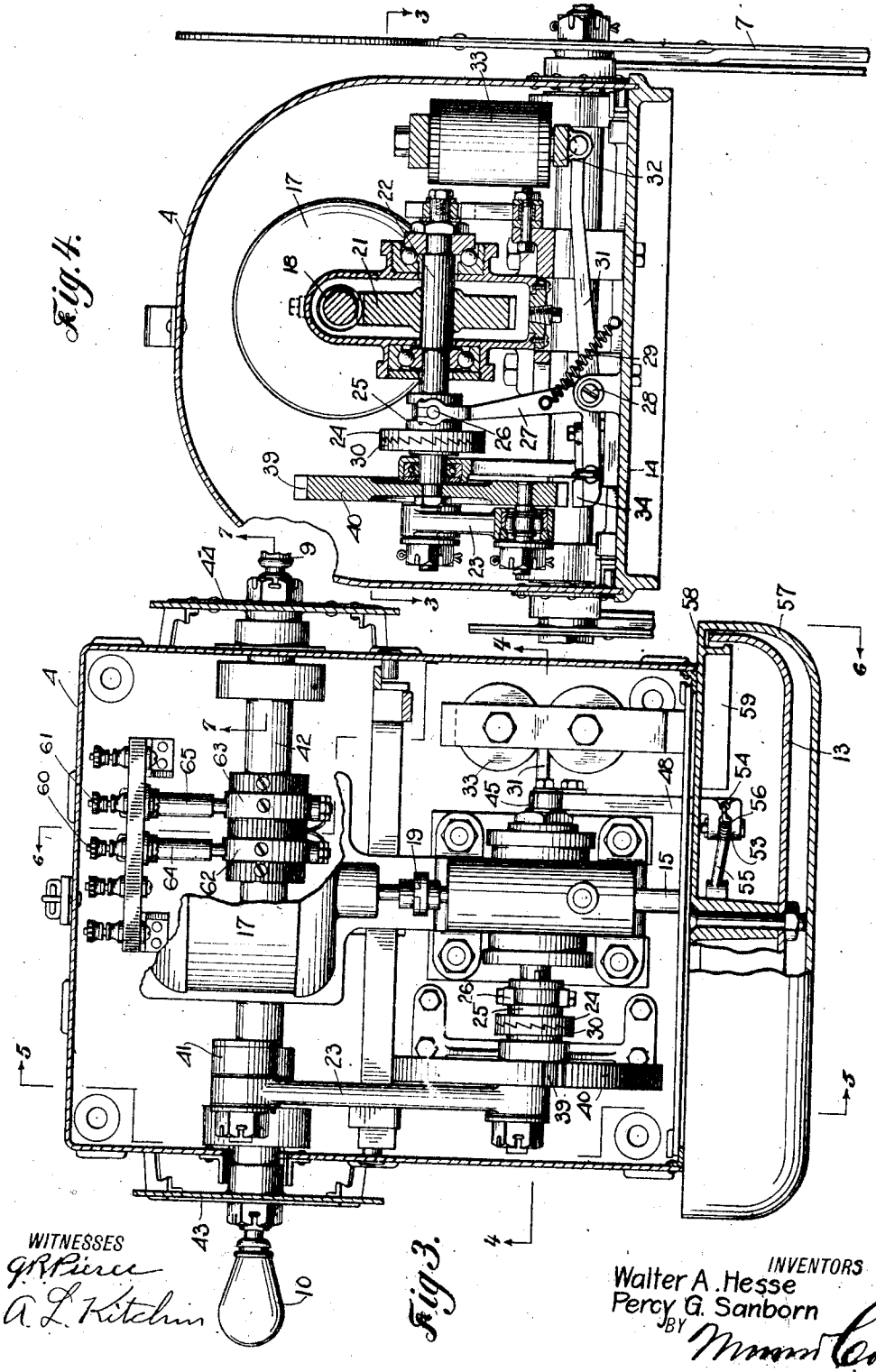


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 5.

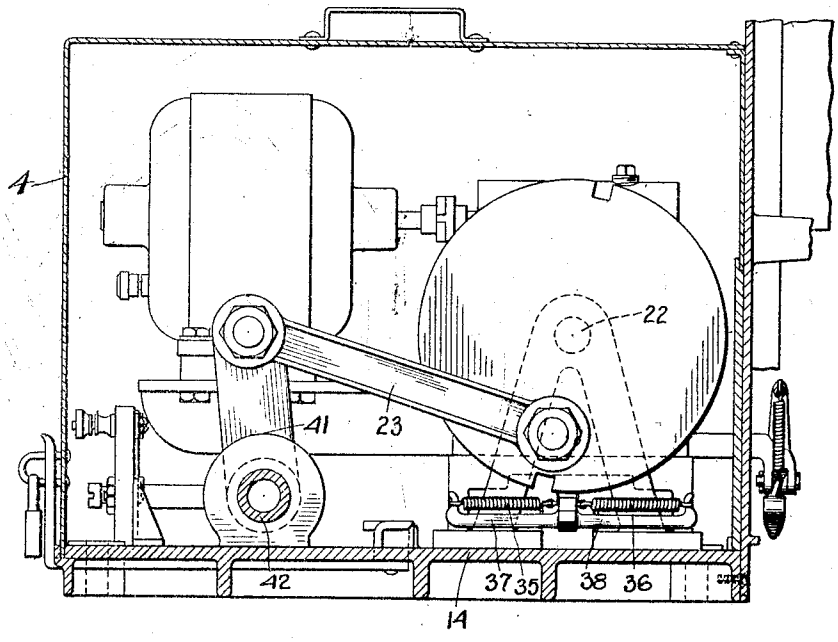
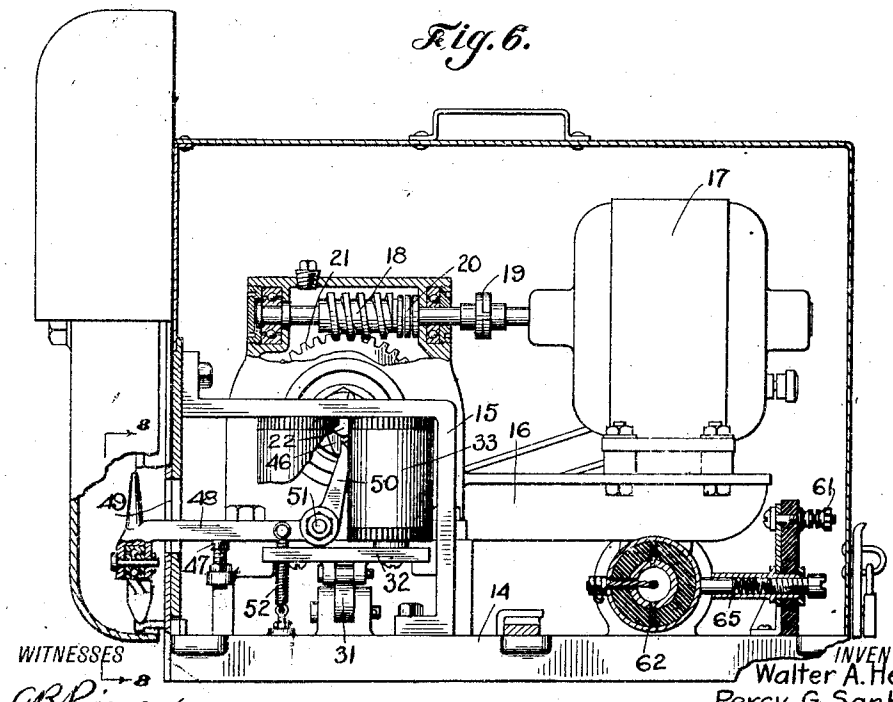


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

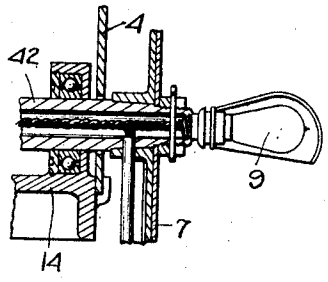


Fig. 8.

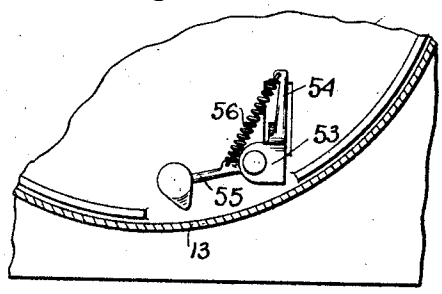
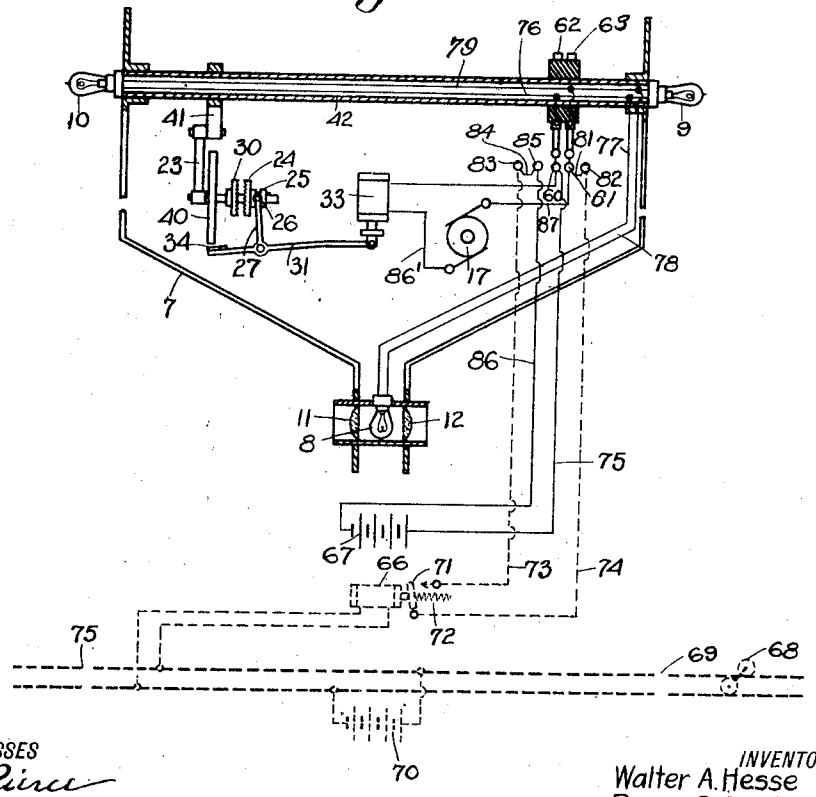


Fig. 9.



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER ALEXANDER HESSE, OF ALAMEDA, AND PERCY GILMAN SANBORN, OF SAN FRANCISCO, CALIFORNIA.

CROSSING-SIGNAL.

1,234,664. Specification of Letters Patent. Patented July 24, 1917.

Application filed November 18, 1914. Serial No. 872,755.

To all whom it may concern:

Be it known that we, WALTER A. HESSE and PERCY G. SANBORN, both citizens of the United States, and residents, respectively, of Alameda, in the county of Alameda and State of California, and San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Crossing-Signal, of which the following is a full, clear, and exact description.

This invention relates to improvements in crossing signals, and particularly to signals used on railway crossings for indicating to pedestrians, drivers and other persons crossing a railroad track the condition of the track, namely, whether or not a train is approaching.

Another object of the invention is to provide a crossing signal which will oscillate and which will be automatically lighted when in operation, the light and the signal arm operating in connection with a gong or other sound producing device.

A further object of the invention is to provide an improved and simplified construction oscillating the signal arm and for lighting the lamps so that there will be a minimum number of parts not easily thrown out of order.

A still further object of the invention is to arrange a driving mechanism for the swinging arm so that the arm will begin its movement promptly, and will cease its movement promptly, the various parts being locked when not in operation so that an accidental movement of the arm cannot take place.

In the accompanying drawings—

Figure 1 is a side view of a signal arm and support, and associated parts embodying the invention;

Fig. 2 is an edge view of the arm and associated parts shown in Fig. 1;

Fig. 3 is a sectional view through Fig. 4 approximately on line 3—3, the same being on an enlarged scale;

Fig. 4 is a sectional view through Fig. 3 on line 4—4;

Fig. 5 is a sectional view through Fig. 3 on line 5—5;

Fig. 6 is a sectional view through Fig. 3 on line 6—6;

Fig. 7 is a detailed fragmentary view showing how the arm lights are arranged;

Fig. 8 is a detailed fragmentary sectional view showing the arrangement of hammer used in the gong;

Fig. 9 is a diagram showing the general arrangement of the various parts and the way current is supplied thereto as well as the way the current is turned on and off.

Referring to the accompanying drawings by numerals, 1 indicates a standard of any desired kind provided with compartments 2 and 3 having suitable doors, said compartments being designed to receive the batteries and other necessary parts for supplying current to the mechanism arranged in the casing 4 positioned on the arm 5. Arm 5 and brace 6 are secured to the standard 1 in any desired manner, as for instance by being bolted thereto. Arranged on arm 5 is a suitable sign supporting member 7 which may contain any suitable sign for warning people crossing the track of possible danger. The casing 1 contains operating mechanism as shown in Figs. 3 to 6, inclusive, and also carries the oscillating arm 7 which normally remains vertical, as shown in Fig. 1, but which is designed to swing back and forth as shown in dotted lines in Fig. 1 when a train approaches so that a moving signal will be given somewhat on the order of a flagman. In addition to having the moving member presented to the eye lamp 8 will be lighted as well as lamps 9 and 10, whereby the arm 7 will be lighted and a beam of light will be thrown by lamp 8 through the bullseyes or lenses 11 and 12. It is to be understood that the lamps 8, 9 and 10, and arm 7, are intended as signals for persons crossing the track and not for the engineer. In addition to having the visual parts just mentioned, a sounding device is provided, namely, bell 13, which sounds at regular intervals during the swinging of arm 7. Various forms of lamps may be provided, but preferably electric lights are used, and the description of the device will be in respect to electric lights, though it is to be understood that other forms of lamps may be used without departing from the spirit of the invention, as for instance oil lamps.

The detailed construction of the operating mechanism will be seen in Figs. 3 to 6 to which reference is now made. The casing 4 is provided with a comparatively thin shell at the upper part and a comparatively heavy base 14 at the bottom which may be of any material, as for instance a piece of cast

metal having reinforcing ribs. Arranged on the base 14 is a framework 15 having a bracket 16. The bracket 16 acts as a support for the motor 17 which may be of any suitable type, and which is connected to the worm drive 18 by any suitable form of flexible connection 19. A thrust bearing 20 is provided which will hold the worm 18 to its work so as to properly operate the worm gear 21 to which is rigidly secured shaft 22. Shaft 22 is supported by suitable ball bearings as shown in Fig. 4, and in fact all of the moving parts are provided, preferably, with ball bearings except the driving rod 23 which is provided with roller bearings. The shaft 22 carries a clutch 24 having a grooved sleeve 25 adapted to engage the pins 26 on the bifurcated arm 27, which bifurcated arm is pivotally mounted at 28. A spring 29 acts against arm 27 so as to normally hold the clutch 24 out of engagement with clutch 30. Arm 27 is formed integral with a bar 31 having an armature 32 arranged at one end which is attracted by magnets 33 and a pivotally mounted catch 34 at the opposite end which is resiliently held in place by springs 35 and 36 (Fig. 5) so that the member 34 may yield in either of two directions. The bar 31 is provided with extensions 37 and 38 for accommodating the springs 35 and 36. The catch 34 is designed to fit into either of the notches 39 for locking the disk 40 against rotation. Disk 40 is rigidly secured to shaft 41 which is rigidly secured to clutch 30. Whenever the clutch 30 is in engagement with clutch 24 and shaft 22 is rotated, disk 40 will also be rotated and will drive the link 23. As the end of the link 23 connected with disk 40 moves in a circle the opposite end will be moved back and forth, and as the opposite end is connected with the crank 41, crank 41 will be oscillated, which in turn will oscillate the shaft 42 as crank 41 is rigidly secured to shaft 42. Shaft 42 extends through suitable openings in the casing 4, and is supported by suitable bearings as shown in Fig. 5 so that the end may fit into side members 43 and 44 (Fig. 3). Connected with the extreme end of the shaft 42, which is hollow, are lamp sockets for receiving the lamps 9 and 10. Suitable hoods are arranged above these lamps so as to reflect the light downwardly and against the arm 7. It will be noticed that there is a lamp on each side of the arm, and that lamp 8 shines on opposite sides of the arm so that a person approaching from either direction will be warned. By this construction and arrangement whenever current is turned on to the magnets 33, and to motor 17, magnets 33 will move armature 32 and the parts connected therewith as shown in Fig. 4 so as to clutch the clutch members 24 and 30, and to disengage catch 34. After these operations have been accomplished, the motor will start to rotate the worm 18, and will consequently rotate the worm wheel 21 which will result in the rotation of shafts 22 and 42 and disk 40. Upon the rotation of disk 40 the connecting bar 23 will be operated and shaft 42 will be rocked. The side members 43 and 44 of the arm 7 are rigidly secured to shaft 42 as shown in Figs. 3 and 9 so that when shaft 42 is rocked the arm will also be rocked. Simultaneously with the turning on of the current to the magnets 33 and motor 17, current will be thrown on to the lamps 8, 9 and 10. During the operation of the motor and the parts connected therewith the bell or gong 13 will be sounded. In order that this may take place cams 45 and 46 are rigidly secured to shaft 22, and are arranged to engage the pawl 50 during their rotation. Pawl 50 is pivotally mounted at 51, and is normally held in the position shown in Fig. 6 by a spring 52. When either of the cams 45 or 46 operate the pawl 50 the operation will be against spring 52 which will immediately move the parts back to the original position as soon as the cam has passed. A stop 47 limits the movement of the extension 48 of pawl 50. The extension 48 projects through a suitable opening 49 in the casing 1 so that the head 53 and arm 54 (Fig. 8) may be arranged exteriorly of the casing. A clapper or hammer 55 is pivotally mounted on head 53 and held in a predetermined position by spring 56 so that when the extension 48 is raised and then suddenly dropped the momentum will cause the hammer 55 to strike the bell 13. The bell is especially constructed, as shown in Fig. 3, so as to prevent the entrance of water or any considerable amount of dust or dirt. The upper part is arranged with a hood 57, which hood has a face 58 covering the open part of the bell. The face 58 is provided with an annular ring 59 projecting into the bell but spaced therefrom. This ring is broken away opposite the hammer 55 so that when the hammer works the same may strike the bell directly.

In arranging the wiring system the same may be arranged in different ways, but preferably the current is led to lamps 9 and 10, and also lamp 8 through the binding posts 60 and 61, which binding posts are connected to slip rings 62 and 63 through suitable brushes 64 and 65. The particular way in which the various wires are arranged is shown more particularly in the diagram of Fig. 9 wherein it will be seen that whenever the magnet 66 is deprived of current the lamps, motor and magnets heretofore described will be provided with current from battery 67.

In operation when a train approaches the crossing and the wheels 68 of the first car or locomotive pass the gap 69, the battery 70

will be short circuited which normally supplies current to magnet 66, and thus holds the armature 71 open. When magnet 66 is deprived of current by the train short circuiting the circuit thereof, spring 72 will move the armature 71 so as to close the circuit through wires 73 and 74. Magnet 66 will be deprived of current until the train passes the gap 75, whereupon the battery 70 will energize magnet 66 and move the armature to the dotted position shown in Fig. 9 against the action of spring 72. When the armature 71 is open, and the circuit for wires 73 and 74 is closed, current will pass from the battery 67 to wire 75, binding post 60 and will then divide and part go to the magnets 33 and part to the slip ring 62. Current passing through slip ring 62 will pass from thence to wire 76 through a suitable connecting wire and from wire 76 will pass the lamps 9 and 10, part passing through wire 77 to lamp 8. The current passing to lamp 8 will return through wire 78 to wire 79, and the current from lamps 9 and 10 will also pass to wire 79 and from thence to slip ring 63 through a suitable connecting wire. From slip ring 63 current will pass to binding post 61, wire 81, binding post 82, wire 74, armature 71, wire 73, binding post 83, wire 84, binding post 85, wire 86 back to the battery 67. Current passing from binding post 60 to the magnets 33 will energize these magnets and will then pass through wire 86′ to the motor 17 and from thence back to binding post 61 to wire 87. From binding post 61 the current will pass through the circuit heretofore traced to the source of current, namely, battery 67.

What we claim is—

1. In a crossing signal of the character described, a support, a swinging arm arranged on said support, electrically operated mechanism for operating said swinging arm, a lamp arranged adjacent each side of the pivoted end of said arm, a lamp arranged adjacent the outer end of said arm, and means for simultaneously turning on electrical current to said electrically operated mechanism and to all of said lamps, whereby current will only be supplied to said lamps during the time of operation of the signal arm.

2. In a crossing signal of the character described, a signal arm, means including a rock shaft for swinging or waving said arm, an electrically actuated power member for actuating said shaft, said power member including a rotating member, a locking member adapted to engage said rotating member for locking said rock shaft, electrically operated means for disconnecting said locking member, said electrically operated means being supplied with current simultaneously with said power member, and means for supplying current to said power member and to said electrically operated means.

3. In a crossing signal of the character described, a signal arm, a rock shaft rigidly secured to said signal arm for swinging or waving the arm, a crank and pitman for rocking said rock shaft, a rotating member for operating said pitman, a power member, means for connecting the power member with said rotating member, means for driving said power member, a locking member for locking said rotating means, and electrically operated means for disconnecting said locking member, said electrically operated means being actuated when said power member is actuated.

4. In a crossing signal of the character described, a signal arm formed with a pair of plates spaced apart, a lamp arranged at the lower end of said arm between said plates, a reflecting glass arranged adjacent each of said plates on opposite sides of said lamp, a lamp arranged adjacent each of said plates near the upper end thereof, a rock shaft secured to said plates and supporting the same, said rock shaft being designed to swing said arm, all of said lamps moving with said arm, a motor, means for supplying current to said motor and to said lamps, a movable member for closing the circuit of said means, and mechanism associated with said motor and with said shaft for translating the movement of said motor into a back and forth or rocking motion for said shaft.

5. In a crossing signal of the character described, a movable signal arm, a shaft for supporting said arm, a crank for moving said shaft, a pitman for operating said crank, a rotating disk connected with said pitman for operating the pitman, said disk being provided with notches, power means for rotating said disk, a pivotally mounted catch adapted to fit into any of said notches, a spring arranged on each side of said catch for resiliently resisting the movement of the catch, a movable member for moving said catch toward and from said disk, and means for moving said movable member away from said disk immediately previous to the rotation of the disk so as to unlock the same.

6. In a crossing signal of the character described, a swinging arm, a shaft secured to said arm for moving the same, a crank connected with said shaft for rocking the shaft, a rotating disk provided with notches, a connecting rod pivotally connected with said arm and with said disk so that when said disk is rotated the crank will be moved so as to rock said shaft, a clutch member connected with said disk, a power member having a clutch coacting with said first mentioned clutch member, an arm for moving said clutch on said power member into en-

gagement with said clutch member, a pivotally mounted pawl for actuating said arm, a spring for holding said pivotally mounted pawl in a predetermined position which will maintain the clutch member out of engagement with the clutch, an electrically operated member for moving said pivotally mounted member against the action of said spring so as to cause the clutch and the clutch member to engage a catch mounted on said pivotally mounted member, said catch being adapted to enter any of the notches in said disk, means for causing said catch to yield when the same has entered said notches so as to yieldingly resist the rotation of said disk, an electric motor for driving said power means, and means for simultaneously turning on current to said motor and to the electrically operated means for throwing said clutch into and out of operation, whereby the clutch and clutch members are engaged and the rotating disk is unlocked simultaneously with the application of power to said power member.

7. In a crossing signal of the character described, a swinging arm, a shaft for supporting said swinging arm, means for rocking said shaft, said means including an electric motor, a power shaft, a rotating disk, a pair of clutch members for connecting said power shaft with said disk, and means for translating the rotary motion of said disk into a rocking motion, a pivotally mounted lever having an arm engaging one of said clutch members, a magnet for operating said lever in one direction for causing said clutch members to engage a spring acting on said lever for causing said clutch members to disengage when said magnet is deënergized, and a locking member for said disk mounted on said lever and designed to engage and lock said disk when said lever is moved by said spring, and means for substantially simultaneously turning on current to said electric motor and to said magnet, whereby said disk will be unlocked and said clutches will be engaged simultaneously with the turning on of power to said power shaft.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WALTER ALEXANDER HESSE.
PERCY GILMAN SANBORN.

Witnesses:
SCOTT SIMONS,
JAMES LOOP.