Nov. 17, 1931. A. MIMMS 1,832,232

AUTOMATIC RAILROAD CROSSING GATE

Filed Sept. 18, 1929 5 Sheets-Sheet 1

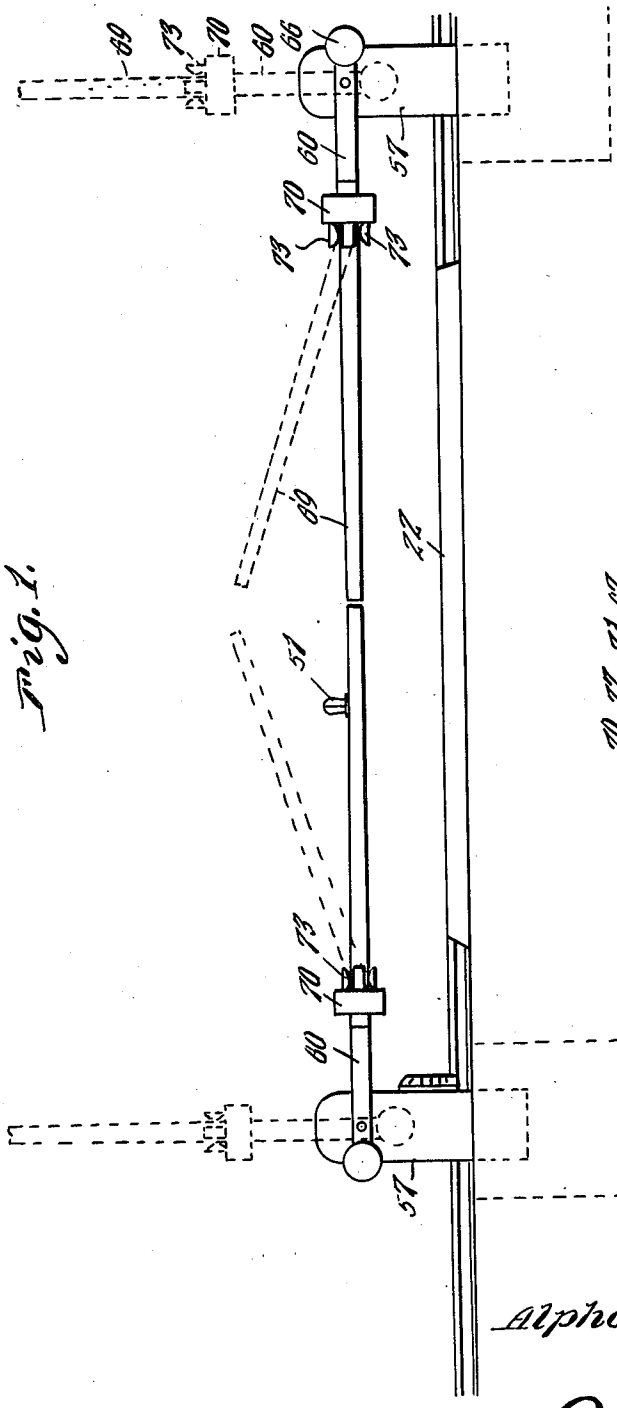


Fig. 1.

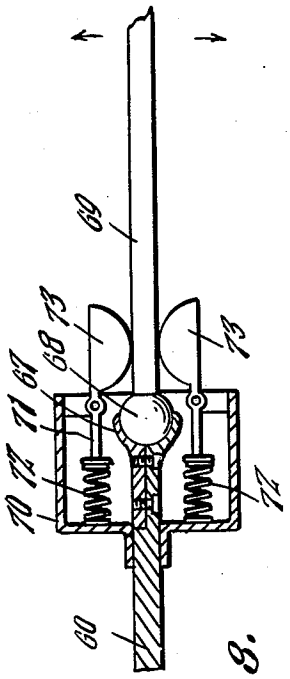


Fig. 2.

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AUTOMATIC RAILROAD CROSSING GATE

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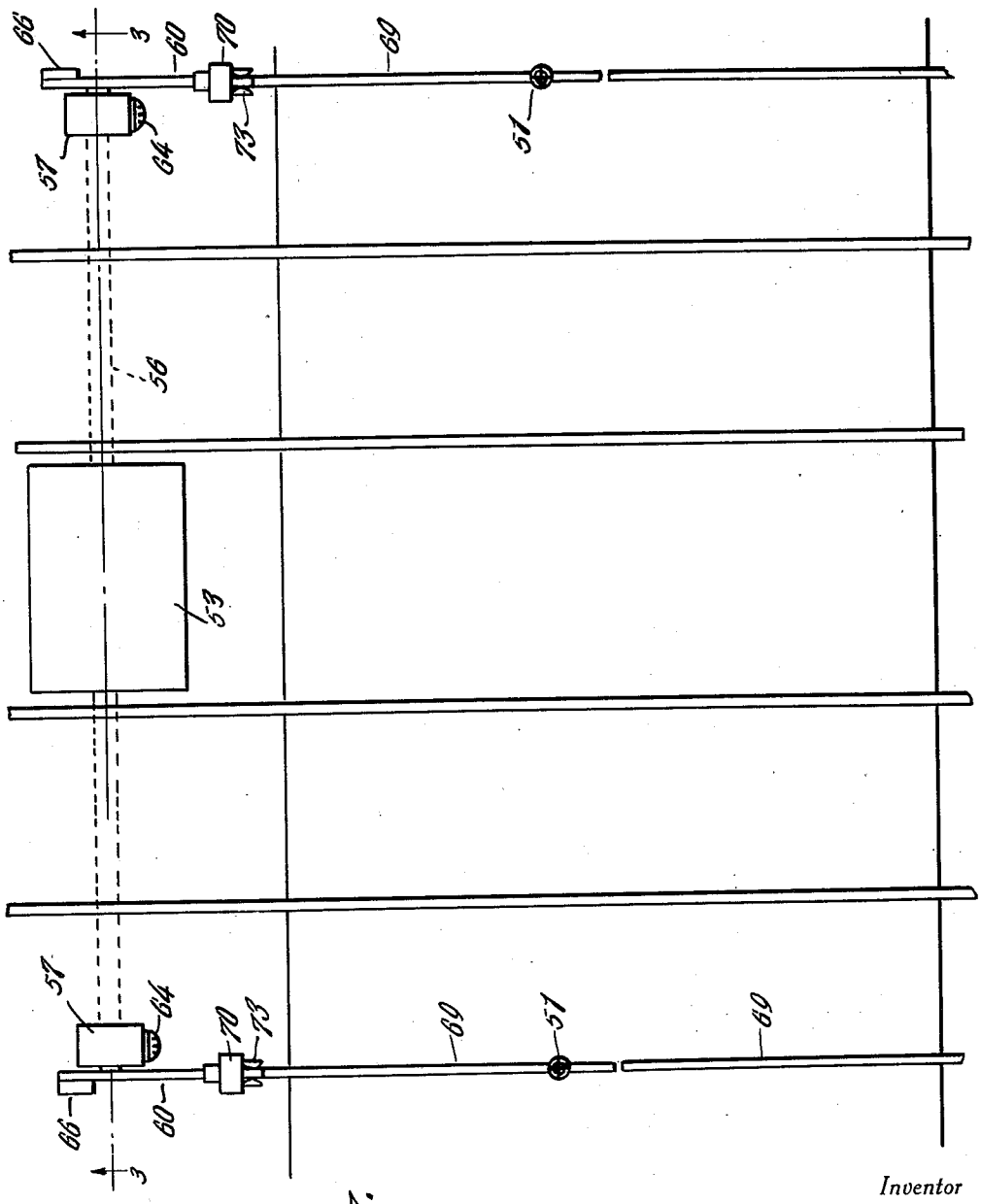


Fig. 2.

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AUTOMATIC RAILROAD CROSSING GATE

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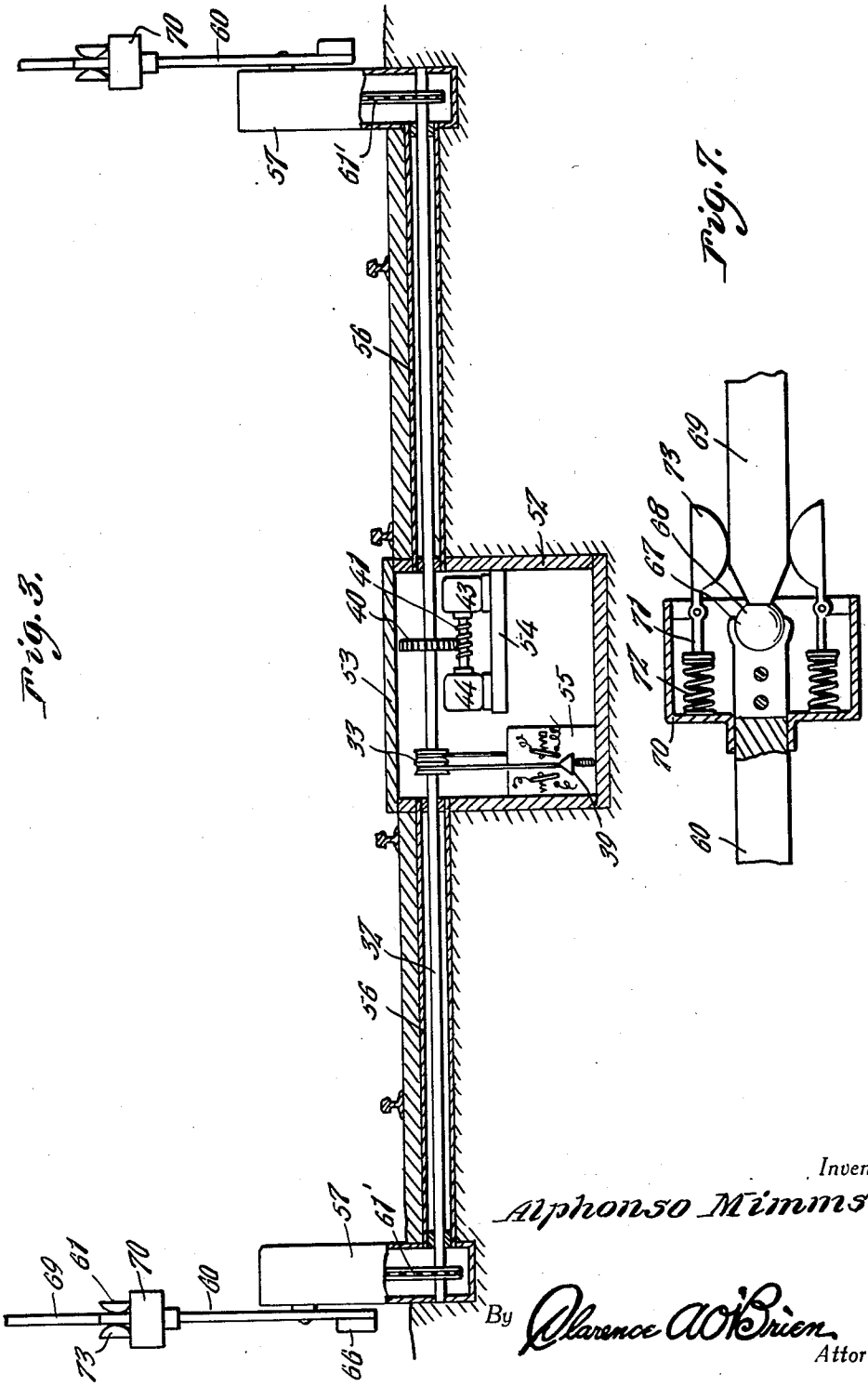


Fig. 3.

Fig. 7.

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AUTOMATIC RAILROAD CROSSING GATE

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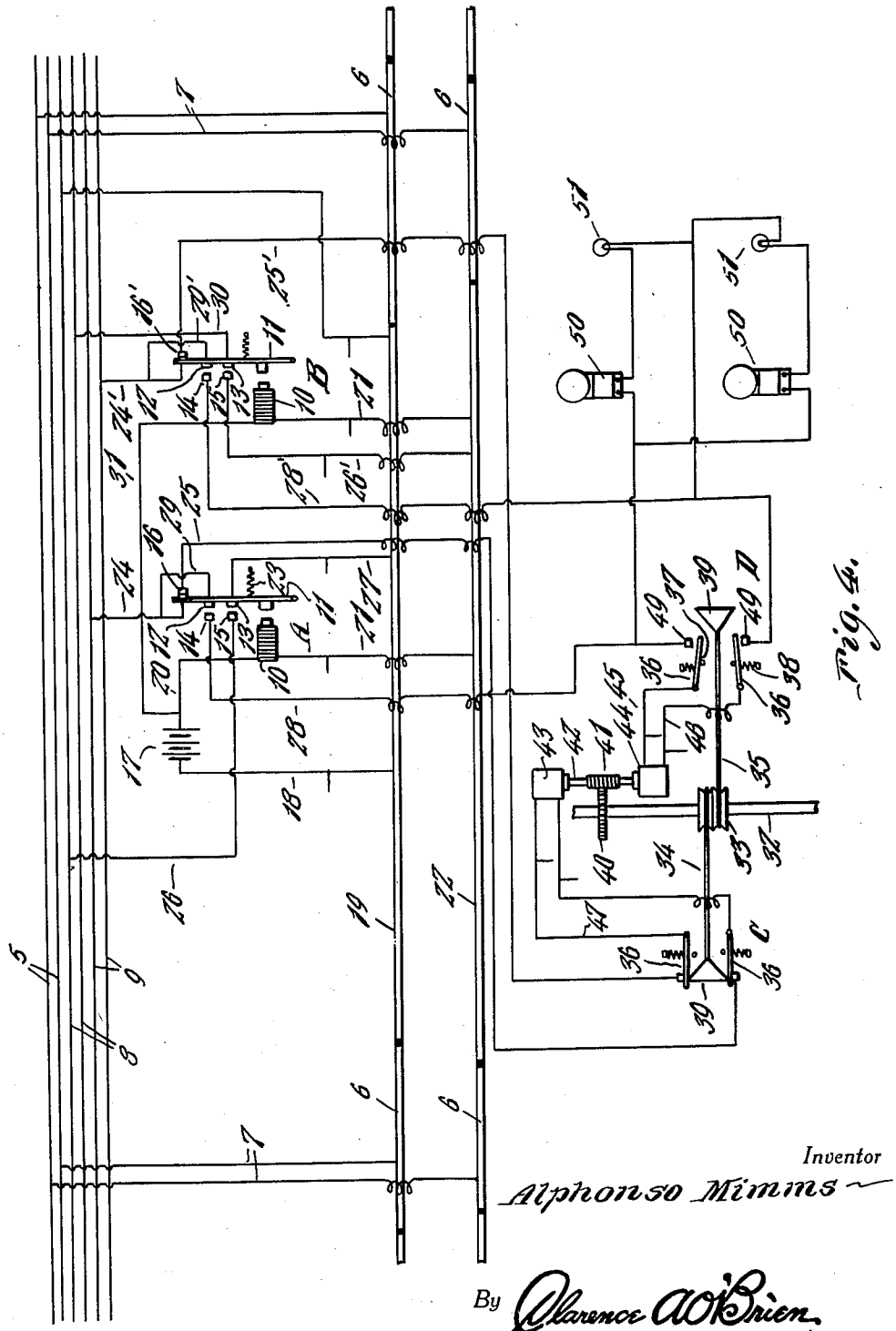


Fig. 4.

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AUTOMATIC RAILROAD CROSSING GATE

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Fig. 6.

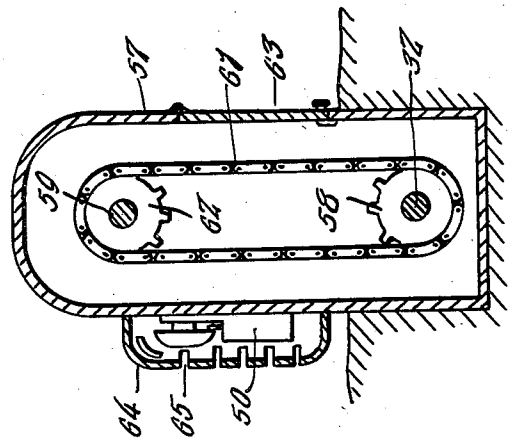
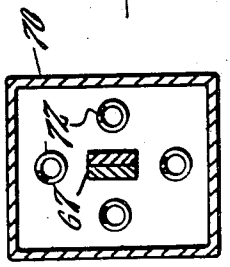


Fig. 9.



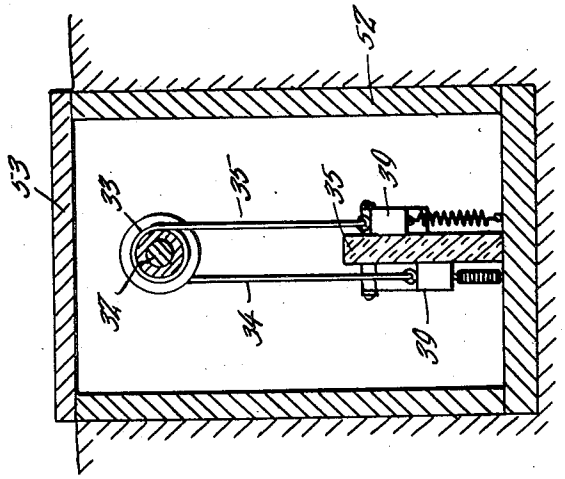




Fig. 10.

Fig. 5.

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Patented Nov. 17, 1931 1,832,232

UNITED STATES PATENT OFFICE

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AUTOMATIC RAILROAD CROSSING GATE

Application filed September 18, 1929. Serial No. 393,475.

The present invention appertains to new and useful improvements in railroad crossing gates and more particularly to a gate capable of being actuated through the agency of automatic means.

The principal object of the invention is to provide an electrically operable crossing gate, the circuit of which includes the rails of the trackway, and this without in any way interfering with the usual block signal system.

Another important object of the invention is to provide an automatic railroad gate of the semaphore type in combination with a signal light and sound producing means which operate during the movement of the gate to road obstructing position.

These and various other important objects and advantages of the invention will become more apparent to the reader after considering the invention as described and claimed hereinafter.

In the drawings:

Figure 1 represents a side elevation of the novel double gate structure at one side of the trackway.

Figure 2 represents a top plan view of a trackway and the gate at the opposite sides of the trackway in operative position with respect to the roadway.

Figure 3 represents a partial vertical sectional view taken substantially on line 3—3 of Figure 2.

Figure 4 represents a diagrammatic view disclosing the system for operating one double gate at one side of the trackway.

Figure 5 represents a vertical transverse sectional view of the automatic switch and gate operating means.

Figure 6 represents a vertical transverse sectional view through the gear housing for operating one of the semaphore arms.

Figure 7 represents a fragmentary and partial sectional view of one of the semaphore arms.

Figure 8 represents a fragmentary and partial sectional view looking at one of the semaphore arms at a point at right angles with respect to the view shown in Figure 2.

Figure 9 represents a cross sectional view through the jointed semaphore arm.

Figure 10 represents a cross sectional view through the conduit and shaft therein leading from the switch housing shown in Figure 3.

Referring to the drawings wherein like numerals designate like parts, the diagrammatic view of Figure 4 will be first taken up for discussion. In this view, by way of example, a single trackway is disclosed along with the typical connection between the gate-operating block and the means for operating one semaphore arm at each side of the trackway. The numeral 5 denotes a pair of conductors which bridge the gate block, the same being connected to the rail section 6 at each end of the gate block by means of connectors 7.

It will also be observed that numerals 8 and 9 each represent current supply lines. In Figure 4, there is also shown a pair of relays denoted by A and B. Each of these relays includes a coil 10 for attracting the armature 11. On each armature contacts 12 and 13 are secured while in opposed relation with respect to these contacts are contacts 14 and 15. The armature 11 normally contacts with a member 16, as is apparent in Figure 4. A battery 17 has one side connected by way of the wire 18 to the rail section 19 while its opposite side has a lead 20 extending to one side of the coil 10 of the relay H.

The opposite side of the relay 10 is connected by way of the conductor 21 to the rail section 22. A spring 23 serves to normally maintain the armature 6 away from the coil 10. A wire 24 extends from the positive side of the current supply 9 and connects to a contact on the armature 11, which contact normally engages the contact 16. This contact 16 has a wire 25 leading therefrom.

A conductor 26 extending from the positive side of the current supply 8 connects to the contact 15 and the opposed contact 13 on the armature 11 is connected by way of the wire 27 to the aforementioned rail section 19. A conductor 28 extends from the contact 14, while the opposite contact 12 is connected by way of the conductor 29 to the aforementioned wire 24.

The relay B has a wire 24′ extending from the negative side of the supply line 9 to a contact on the armature 11 while the opposing contact 16′ has a lead 25′ extending therefrom. A connection 29′ is made between the wire 24′ and the contact 12 while the opposing contact 14 has a connection 28′. The conductor 26′ is connected at one end to the rail section 22 while its opposite end connects to the contact 15, while the opposite contact 13 is connected by way of the wire 30 with the negative side of the current supply 8.

One side of the coil 10 of relay B is connected to the rail section 22 by means of the conductor 21′ while its other side is connected by way of the element 31 to the positive side of the battery 17.

In Figure 4, a shaft 32 is shown and this shaft serves to operate a pair of semaphore arms, one at each side of the trackway. In order to manipulate a pair of these semaphore arms at each side of the trackway, duplicate mechanism must be provided and to accommodate this duplicate mechanism, short leads are shown extending from various wires of the system.

Secured to an intermediate portion of this shaft 32 is a double pulley or roll 33 having a pair of circumferential grooves thereon. Adapted to be wound in one groove is a flexible strand or cable 34, while adapted to be wound in the other groove is a second strand or cable 35. The reversing switches are denoted generally by C and D. Each of these switches includes a pair of arms 36—36 normally urged inwardly toward each other and against the stops 37 by means of springs 38.

A wedge-shaped switch element 39 is secured to the free end of each of the aforementioned cables. A gear 40 on the shaft 32 is in mesh with a worm 41 on the common armature shaft 42 extending between the motors 43 and 44. A connection 45 is made between one of the arms 36 of the switch D and one side of the motor 44, while the opposite side of the motor 44 has a connection 46 to the opposite or complementary arm 36. The switch D has one of its arms 36 connected to one side of the motor 43 through the agency of a wire 47 while the opposite side of the motor 43 is connected to the complementary arm 36 of the switch C, through the conductor 48.

When the switch element 39 of the switch D separates the arms 36, they contact with the elements 49, one of which is connected to the conductor 28, while the other is connected to the conductor 28′. When the switch element 39 of the switch C causes the arms 36 to engage the elements 49, a circuit is completed which involves the wires 25 and 25′. A bell and lamp 50 and 51 respectively are connected in series with the switch D.

As is clearly shown in Figure 3, the shaft 32 is journalled through a housing 52 sunk within the ground in the manner clearly shown in Figure 3. This housing is provided with a removable top 53 and a shell for a bracket 54 supports the aforementioned motors 43 and 44. The contact 49, arms 36 and other features of the switches C and D are mounted on panel boards 55 located within the said housing 52.

Extending away from the housing 52 in opposite directions are the conduit sections 56—56. Each conduit section passes beneath one trackway and communicates with an elongated upstanding housing 57 extending upwardly above the surface of the ground for a substantial height. As is clearly shown in Figure 6, the adjacent end of the shaft 32 is journalled through the lower portion of the housing 57 and carries a sprocket wheel 58, while a short shaft 59 is journalled through the upper portion of the housing and projects at one end through one side of the housing for supporting the section 60 of the corresponding semaphore arm 69.

A sprocket chain 61′ is trained over the sprocket 58 and 62, the last mentioned sprocket being keyed to the aforementioned shaft 59. As is clearly shown in Figure 6, some form of closure 63 is provided at one side of the housing to permit access to the interior thereof. At another side of the housing is secured a casing 64 for enclosing one of the aforementioned bells 50, the casing being provided with suitable sound emanating openings 65.

The semaphore section 60 is connected at an intermediate point to the said short shaft 59 and at one end carries the usual counterbalancing weight 66.

As is clearly disclosed in Figures 7 and 8, the section 60 of the semaphore is provided with a sectional socket 67 at its outer end for receiving the ball head 68 of an extending section 69. To maintain this section 69 in a longitudinally extending position and yet permit the same to flex when struck by a vehicle, cushioning supports are provided. To accommodate these supports a substantially square housing 7 is secured to the section 60 adjacent the socket construction 67 and pivotally secured within the housing 70 and to suitable places thereon are the two pairs of supports, each including an arm 71.

Each arm has one end connected to a spring 72, which spring in turn is connected to the housing 70, while the opposite end of the arm (the end which projects beyond the housing 70) carries a hemispherical shaped enlargement 73 which is normally maintained tensionally against the section 69 by the spring 72.

It will be seen that as the train enters the gate block of the trackway, the switch D will be closed and the motor 44 being energized will rotate the shaft 32 in a direction to swing

the semaphore arms downwardly to road obstructing position. When the train leaves the gate block, the switches reverse their positions whereupon the motor 44 becomes deenergized while the motor 43 becomes energized for retracting the said semaphore arm.

While the foregoing description sets forth the invention in definite terms, it is to be understood that various changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having thus described the invention, what is claimed as new is:

1. A railroad crossing gate comprising an arm formed of two sections, a universal joint connecting the sections together, a supporting member connected with one section, a plurality of levers hinged to the supporting member and having curved parts engaging the sides of the other section and spring means for normally holding the levers with their curved parts against said other section.

2. A railroad crossing gate comprising an arm formed of two sections, a universal joint connecting the sections together, a casing attached to one section and having its open end extending beyond the joint, four levers pivoted in the casing adjacent the open end thereof and having semi-circular portions at their outer ends each of which engages a side of the other section, and a spring connected to the inner end of each lever and to the closed end of the casing for normally holding the levers with their curved portions against the other section.

In testimony whereof I affix my signature.

ALPHONSO MIMMS.