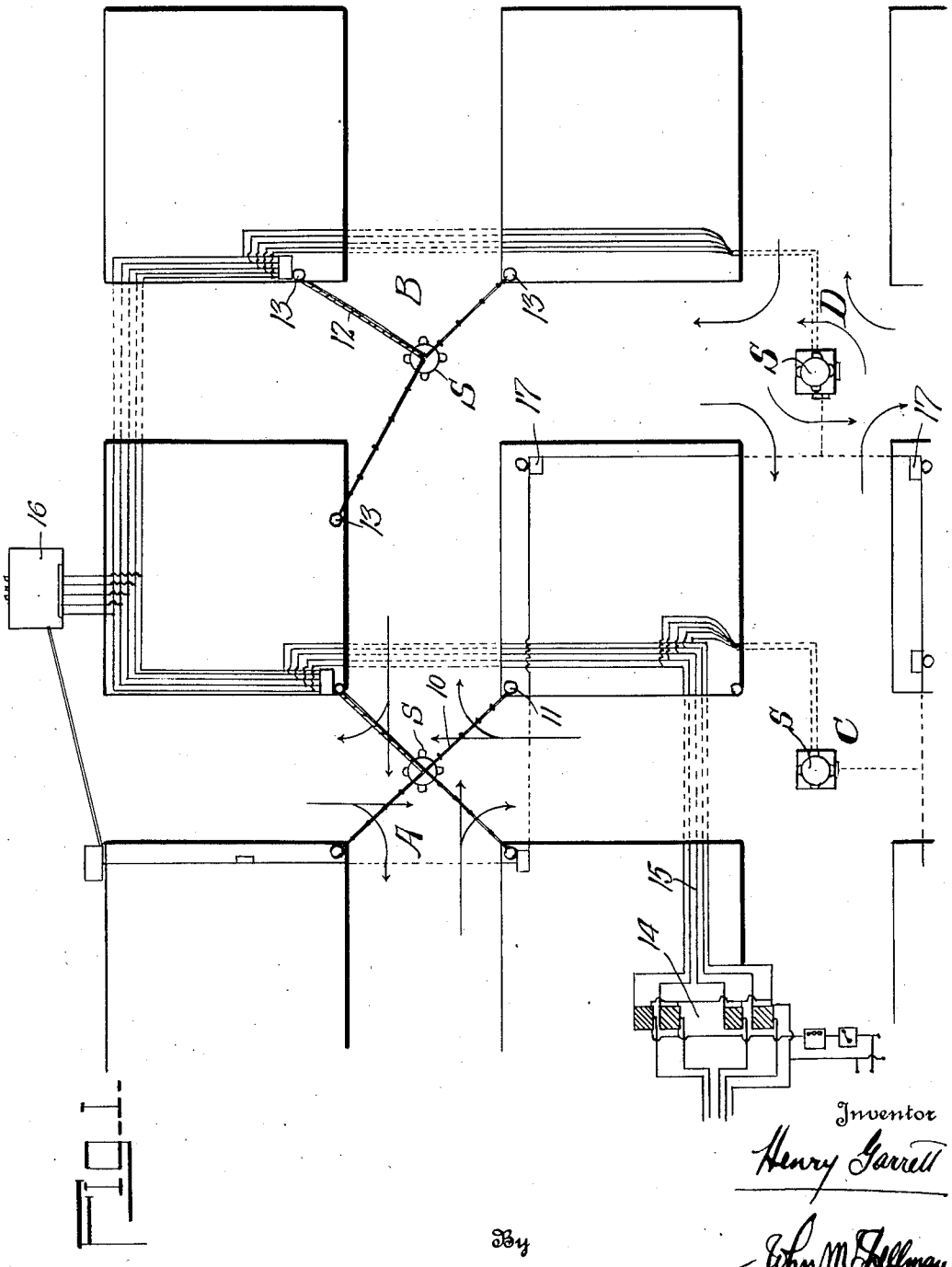
Sept. 17, 1929. H. GARRETT 1,728,602

AUTOMATIC STREET SIGNALING SYSTEM

Filed Feb. 16, 1925 4 Sheets-Sheet 1



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AUTOMATIC STREET SIGNALING SYSTEM

Filed Feb. 16, 1925 4 Sheets-Sheet 2

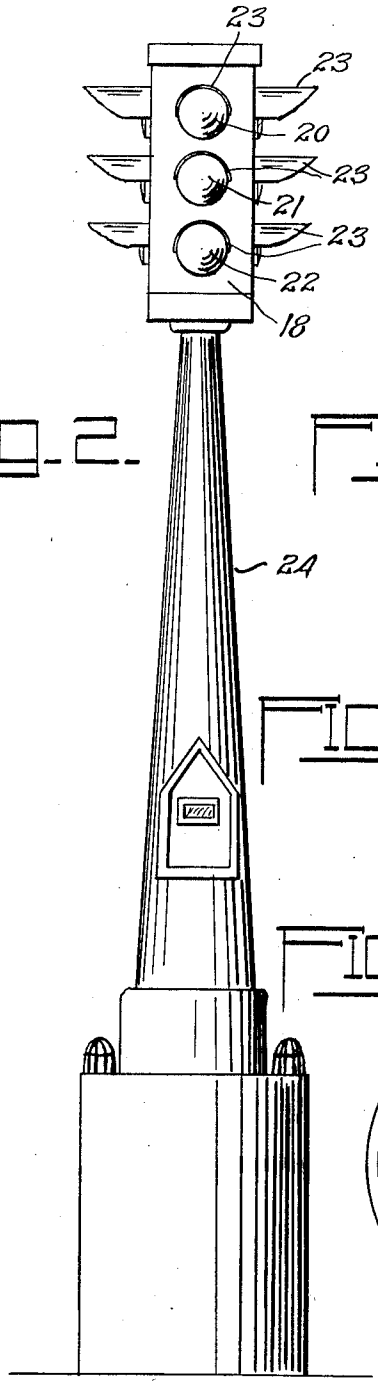


Fig. 2.

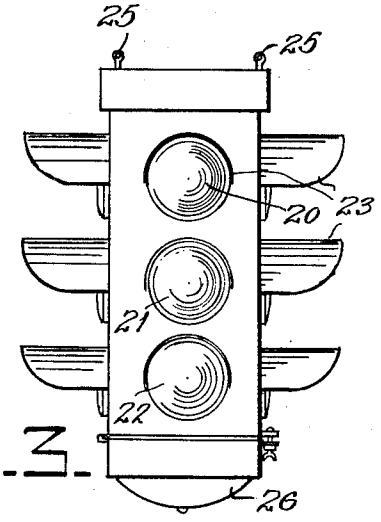


Fig. 3.

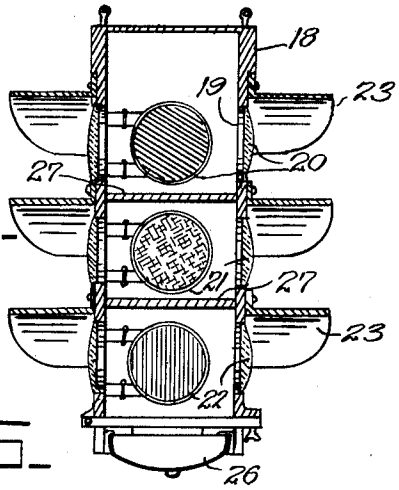
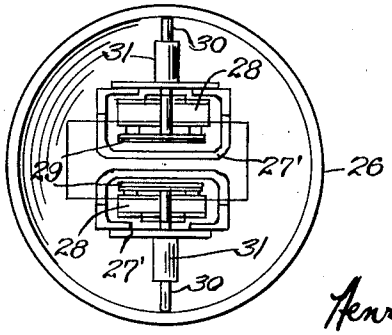


Fig. 4.

Fig. 5.



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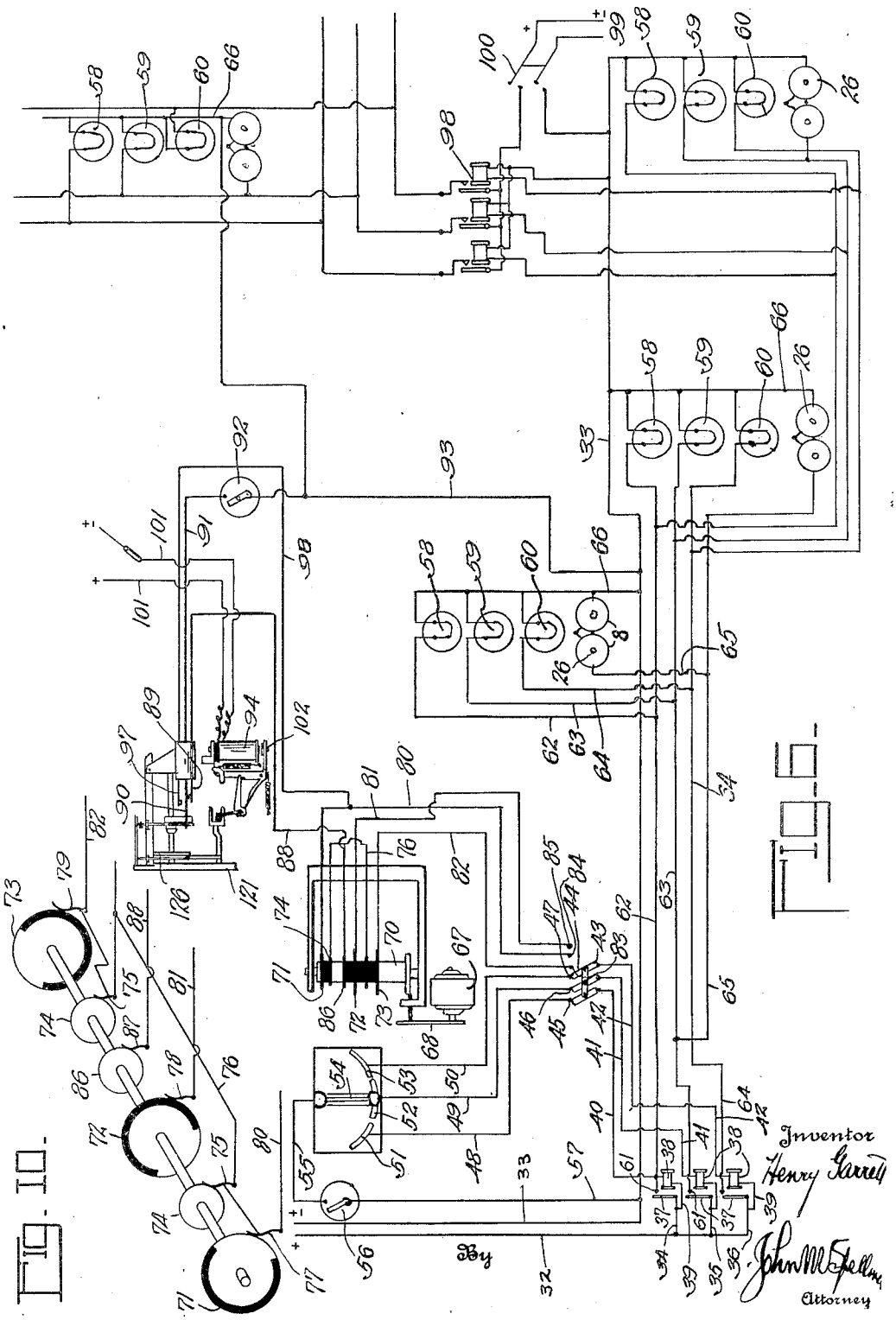


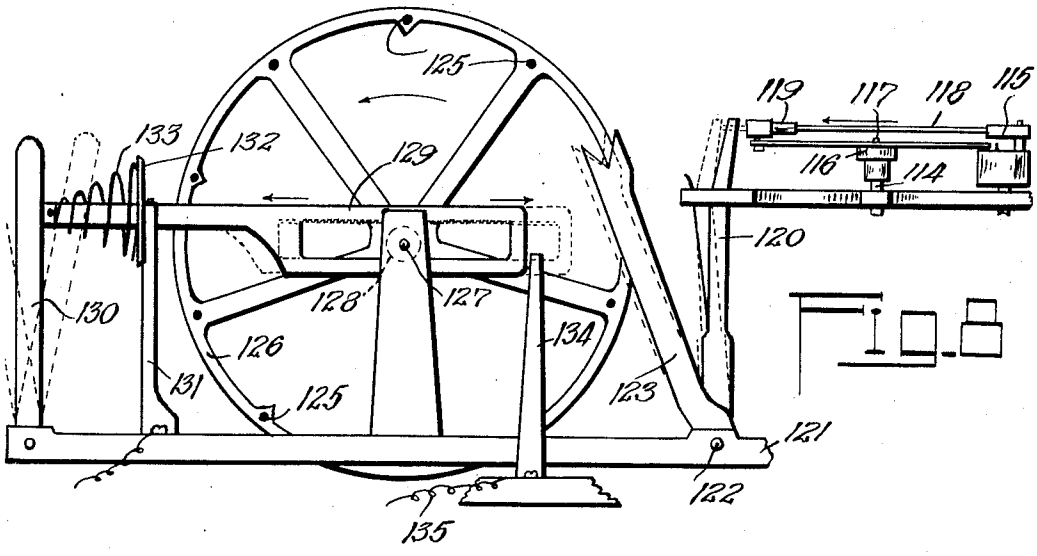
Fig. 10.

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AUTOMATIC STREET SIGNALING SYSTEM

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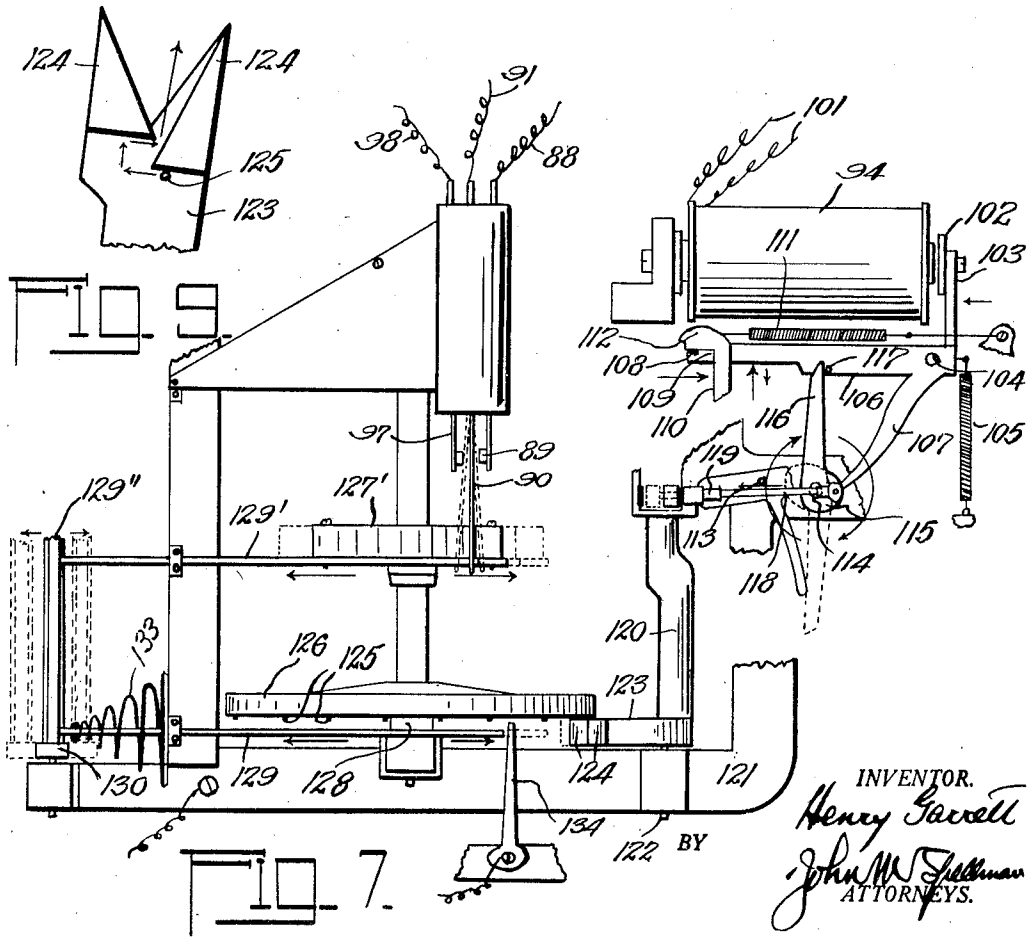


FIG. 7.

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UNITED STATES PATENT OFFICE

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AUTOMATIC STREET SIGNALING SYSTEM

Application filed February 16, 1925. Serial No. 9,625.

This invention relates to traffic signals and has special reference to an improved traffic signaling and fire alarm system and the apparatus therewith used.

One important object of the invention is to improve the general construction of systems of this character so that both audible and visual signals may be given to traffic moving over streets or highways.

A second important object of the invention is to provide a system of this character having novel circuit arrangements for the controlling of traffic and pedestrians at street crossings and intersections.

A third important object of the invention is to provide a system of this character whereby the same circuit ordinarily used for traffic control may also be used for fire alarm controls so that the streets may be kept clear for the passage of the fire apparatus, the circuit arrangement being of novel and improved character.

With the above and other objects in view as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:

Figure 1 is a plan view of the general layout of a system of this character showing various means for suspending or supporting the signaling apparatus.

Figure 2 is a side elevation of a signal post adapted for use in connection with this system.

Figure 3 is a side elevation of a signal intended to be suspended from overhead wires.

Figure 4 is a vertical section through such a signal.

Figure 5 is a view of a special double clapper bell preferably used herewith.

Figure 6 is a wiring diagram showing the various connections and layout of several signals diagrammatically, the view also showing the automatic arrangements and the fire alarm control.

Figure 7 is a plan view of the preferred apparatus for fire alarm apparatus.

Figure 8 is a side elevation of such preferred apparatus, certain parts being omitted.

Figure 9 is a rear view of an end of a certain escapement lever used in connection with the apparatus shown in Figure 7.

Figure 10 is a diagram showing certain circuit closing wheels as used herewith.

In Figure 1 there is disclosed a diagrammatic showing of intersecting streets, four intersections being shown to illustrate different methods of displaying the signals. These intersections are marked respectively A, B. C, and D. At A it will be seen that the signal S is suspended from a pair of crossed wires 10 carried by suitable supports 11 at the corners of street intersections, four of these supports or posts being used. At B there is disclosed an arrangement wherein three meeting wires 12 support signal S from three posts 13. The signal S at C is supported on an ordinary iron column at the street intersection while the signal S at D is intended to show a column on a concrete base. A main station 14 is connected to these various signals by wiring 15 and at 16 is illustrated a fire alarm station, the alarm box being indicated at various points as 17. It is to be understood that this view is simply to illustrate the general layout and the wiring 15 is of general character, no attempt being made to show definitely the various apparatus connected therewith.

Each signal preferably comprises a lantern body or casing 18, see Figures 2, 3 and 4. This lantern body or casing is four sided and has on each side a series of three vertically spaced openings 19 carrying colored lenses. Preferably the one lens 20 is of green glass the center lens 21 is yellow and the other lens 22 is red, each lens being protected by a suitable hood 23. These lanterns may either be supported on posts or columns 24 or the lantern may be provided with suspension means for hanging from the wires at the intersections of the streets. At the lower

part of each lantern is a bell 26. Naturally illuminating means will be provided for each set of lenses and it will be obvious that the case 18 must be divided by suitable partitions 27 to prevent light from one bulb reaching other lenses than that proper to that bulb. Suitably supported within the bell by frames 27, attached to the casing 18 in a manner not deemed necessary to be shown in detail, is an independent pair of magnets 28 each having an armature 29 carrying a plunger or striker 30 which passes through a guide sleeve 31 on the frame. These plungers act as clappers and the duplication serves to ensure clear sounding of the bell even if alternating current be used.

While this special form of bell has been shown other forms may also be used in connection with the wiring system now to be described.

Referring to Figure 6 it will be noted that there is provided a pair of line wires 32 and 33, the wire 32 being the feed wire and the wire 33 being the return wire. From the wire 32 extends three branches 34, 35 and 36 each leading to the armature 37 of a respective relay having a magnet winding 38, one end of the winding of the respective magnet being connected by a branch wire 39 with a respective branch from the wire 32. These relays are connected respectively by wires 40, 41 and 42 Fig. 6 with the terminals 43 of a triple pole, double throw switch having switch arms 44 engageable in one position with contacts numbered respectively as 45, 46 and 47. From these contacts extend the respective wires 48, 49 and 50 which terminate at the contact arcs 51, 52 and 53 of a switch having an arm 54 arranged to traverse these arcs. From the pivot point of arm 54, a wire 55 extends to an ordinary single pole cut out switch 56, this switch being connected by wire 57 with the wire 33. In this diagram the lamps or bulbs for the respective lenses 20, 21 and 22 are shown respectively at 58, 59 and 60, the bell being indicated at 26 as usual. Each armature 37 is arranged to engage a contact 61 and from the respective contacts 61 lead respective wires 62, 63, and 64, these wires connecting with the lamps 58, 59 and 60. Also branching from the wire 64 is a wire 65 which connects with the bell 26, a common return wire 66 being connected in multiple to all three lamps and leading to the wire 33. As will be obvious the wires 62 to 65 may be branched at various points so that more than one signal may be displayed at a time but it is not regarded necessary to here describe each of these branches by separate numbers since the action is the same in all cases and therefore the branch wires have been shown, in this diagram, numbered the same as the wires leading directly from the several relays just described. However, it will also be obvious that if a circuit be established through one electric lamp at each signal the corresponding lamps and bulbs at the other signals being connected in multiple to the respective wires 62, 63, 64 and 65, will also be simultaneously energized.

Now, to consider the operation. Suppose the arm 54 to be positioned on the contact arc 52; then a circuit will first be established from the wire 32 through wire 35, respective contact arm 44, contact 46, wire 49, contact 52, arm 54, wire 55, switch 56, wire 57 to wire 33. This will cause closing of the relay fed by the wire 35 so that now a circuit will be established from the wire 32, through wire 35, respective armature 37, respective contact 61, wire 63, lamp 59, and simultaneously the bell 26, and wire 66, back to wire 33. Thus in this position the central or yellow lights and bells of the various signals will operate. Now, by shifting the arm 54 to contact 51 or 53 a similar circuit may be traced through the respective lamps 58 and 60. Thus the shifting of the arm 54 controls the display of colored lights in all the signals connected to the circuit and at the same time may, when desired, give the audible signal through the energization into bell 26.

The system just described is intended for manual operation by the shift of the arm 54 but provision is also made for automatic operation, that is to say the three colors of lamps may be arranged for automatic display one after the other without manual intervention. To this end there is provided a motor 67 Fig. 6 connected by a belt 68 and other reducing gearing to a contact shaft or drum 70. This contact shaft or drum is provided with the usual and common construction of contact rings and disks. These contact disks are, as is common in such devices provided with insulating segments as shown in Figure 13 and are arranged at different positions on the drum so that the ordinary brushes make contact therewith at different times. Such an arrangement of common character is illustrated in Figure 13 as well as in Figure 6. It will be noted that in both Figures 6 and 13 there are shown three disks 71, 72 and 73 arranged with their insulation spaced at 120 degrees and extending around two-thirds of the disk. It will be obvious that this arrangement is not essential but the contact portions of the various disks may be varied to suit the particular case.

Also there are two contact rings 74 which are engaged by brushes 75 connected by wire 76. The rings 71, 72 and 73 are engaged by respective brushes 77, 78 and 79 from which lead wires 80, 81 and 82, these wires terminating at respective contacts 83, 84 and 85 positioned to be engaged by the switch arms 44. There is furthermore provided a contact ring 86 engaged by a brush 87 from which

leads a wire 88 which may connect directly with the wire 33 but which is shown as terminating in a contact 89 engaged by a contact arm 90, which is connected by wire 91 with an ordinary single pole switch 92, the latter being connected by wire 93 with the wire 33. The purpose of this particular method of running these wires will be understood when the alarm arrangement part of the invention is described.

Now, under these conditions when the automatic apparatus is desired to be brought into play the switch arms 44 are shifted to the contacts 83, 84 and 85. Then it will be seen that, as the shaft revolves the relays to which the wires 34, 35, and 36 lead will be closed in succession, two of the relays being always open and the other closed. Now consider the conditions as shown in Figure 13. It will be observed that with the switch thrown as described, current will flow from the wire 32, over the wire 34, through the respective magnet 38, wire 40, switch arm 44, contact 83, wire 82, contact disk 73, shaft 70, contact ring 86, wire 88, contact 89, contact 90, wire 91, switch 92, wire 93 and back to wire 33. This, of course, will close the relay feed by the wire 34 and thus a circuit will be established for the wire 32, through wire 34, armature 37, contact 61, wire 62, lamp 58 wire 66, back to the wire 33. As the shaft 70 revolves the other contact disks are successively brought into play.

The fire alarm operation of the system is controlled by a magnet 94 which is in circuit with an ordinary Gamewell fire alarm station through wires 101. This magnet 94 has an armature 102 which, through certain mechanism, hereafter described, shifts the contact arm 90 from engagement with the contact 89 into engagement with a contact 97 connected by a wire 98 with the wire 80. The mechanism interposed between the armature lever 102 and the contact 90 may be of such character, as will be presently understood, as to effect intermittent operation of the contact arm 90. However, we may suppose for the purpose of understanding this feature of the apparatus, that there is an ordinary link connection between the armature 102 and arm 90 so that, as the armature is attracted by the magnet 94 the ordinary automatic circuits are broken and a new circuit established. Now the wire 80 it will be remembered is connected to the contact 74 therefore when the arm 90 is moved into engagement by the action of the magnet 94, with the contact 97 a current will be established from the wire 32 through wire 35, relay magnet 38, wire 41, contact 43, arm 44, contact 84, wire 80, wire 98, contact 97, arm 90, wire 91, switch 92, wire 93 and back to the wire 33. This closes the relay and this establishes the circuit from the wire 32, wire 35, armature 37, contact 61, wires 63 and 65, lamp 59 and bell 26, wire 66 and back to the wire 33. Thus, so long as the arm 90 engages the contact 97 the yellow lamp will be lit and the bell ring in each signal. At the same time by reason of contact being broken between arm 90 and the contact 89 the automatic light shifting apparatus will be disengaged so that current will not flow through the wire 88 and consequently, the lamps 58 and 60 will remain unlit so long as the fire alarm is being sent through. This will indicate that the traffic must stop in both directions.

In some instances it may be desired to cut in or cut out certain signals and to that end relays 98 may be employed obtaining their power from line wires 99 to which they can be connected by a two-pole single throw switch 100.

We will now consider the specific form of apparatus designed particularly for fire alarm operation, this form of apparatus being shown especially in Figures 7, 8 and 9. As before noted in this apparatus there is provided a relay magnet 94 and from this magnet extends the wires 101 controlled by an ordinary fire alarm switch not shown in detail but illustrated in the patent to Gamewell 273,033. The magnet is provided with an armature 102 which is carried by an arm 103 pivoted at 104 and normally held away from the magnet by a spring 105. This arm 103 has extending therefrom arms 106 and 107 which form a fork. On the arm 106 is a pin 108 which normally rests in the angulared portion 109 of a lever 110. Upon energization of the magnet 94 the armature 102 is attracted, the pin 108 released from its engagement with the lever 110 and this lever, as will be presently described, is pulled over by a spring 111 so that the spring drops into a notch 112. The lever 110 is pivoted at 113 and one arm of this lever is provided with a pivot 114 whereon is supported a cam 115 having an arm 116 extending therefrom and normally engaging a pin 117 on the arm 106. The pin 117 is so positioned that the releasing of the lever 110 from the pin 108 frees the arm 116 and its cam and this lever thereupon is moved around to the dotted line position of Figure 7 by an ordinary spring motor not shown. As this movement takes place the engagement of the cam with the arm 107 restores arm 103 to normal position. Carried by this cam is a link 118 which moves through a sleeve 119 and engages the arm 120 Fig. 8 of a bent lever pivoted to a base 121 at 122 and having a second arm 123. The arm 123 constitutes an escapement device and is provided with a pair of pallets 124 Fig. 9 for operating as an ordinary anchor escapement with respect to certain pins 125 projecting laterly from the periphery of a wheel 126. This

wheel is carried on a shaft 127 and is operated by a spring motor conventionally shown in Fig. 7 at 127′ and on its shaft is a gear 128 whereon meshes a rack 129. Pivoted to the base 121 is an arm 130 to which one end of the rack bar 129 is connected a rod 129′ extends from an arm 129″ rigid with arm 130 and is connected to the spring contact arm 90, Fig. 7. At 131 is a support extending upwardly from the base 121 and this support carries at its upper end a plate 132 wherethrough the bar 129 passes. A spring 133 positioned between the plate 132 and the arm 130 urges the arm to the left of Figure 8. As is well known, when a fire alarm is turned in from a Gamewell fire alarm box, at least four impulses, generally more, will be necessary for the officer at the central station to locate the box from which the alarm came. In my apparatus, therefore, there will always be four or more impulses sent through the magnet 94 and the wheel 126 will turn at least four steps under the control of the pallets 124. This will move the rack bar 129 at least four steps which will always be sufficient to move the arm 90 over into contact with the contact 89, Fig. 7, thus cutting out the automatically operated red and green lights and cutting in continuous lights and bells. After the fire, the bar 129, Fig. 8, is restored in any convenient way by an attendant, thus permitting the arm 90 to assume its normal position for making connection to automatically operate the red and green lights alternately. This arm 130 is the arm that controls the operation of the arm 90 as will be seen by reference to Figure 8. Accordingly energization of the magnet 94 causes the cutting off of the ordinary circuit and the turning on of the fire alarm circuit.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

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

1. In a traffic control system, in combination, a crossing signal station including an electric stop and go traffic signal, means for automatically operating the signal periodically and successively for normally controlling street traffic, and electrically operated means for automatically cutting out all except the stop signal and for operating said stop signal at said crossing station as a fire warning, said electrically operated means being connected with a city fire alarm circuit and automatically actuated by impulses imposed upon said circuit by the turning in of a fire alarm, whereby a continuous warning signal during the period of the fire alarm is automatically operated by said fire alarm circuit and is substituted in place of the said periodic and successive changes of signals during the normal operation of said crossing signal station.

2. A traffic control system, including a plurality of crossing signal stations, each including an electric stop and go signal, means for automatically operating the signals at all said stations periodically and successively for normally controlling street traffic, and electrically operated means for automatically cutting out all except the stop signals and for operating continuously the stop signals at all said crossing stations as a fire warning, said electrically operated cut out means being connected with a city fire alarm circuit, and automatically actuated by impulses imposed upon said circuit by turning in of a fire alarm, whereby a continuous warning signal is automatically operated by said fire alarm circuit and is substituted in place of said periodic and successive changes of signals during the normal operation of said crossing signal stations.

In testimony whereof I have signed my name to this specification.

HENRY GARRETT.