No. 848,636. PATENTED APR. 2, 1907.

W. CONDON.

FIRE AND POLICE SIGNALING SYSTEM.

APPLICATION FILED JULY 7, 1902.

4 SHEETS—SHEET 1.

Fig 1

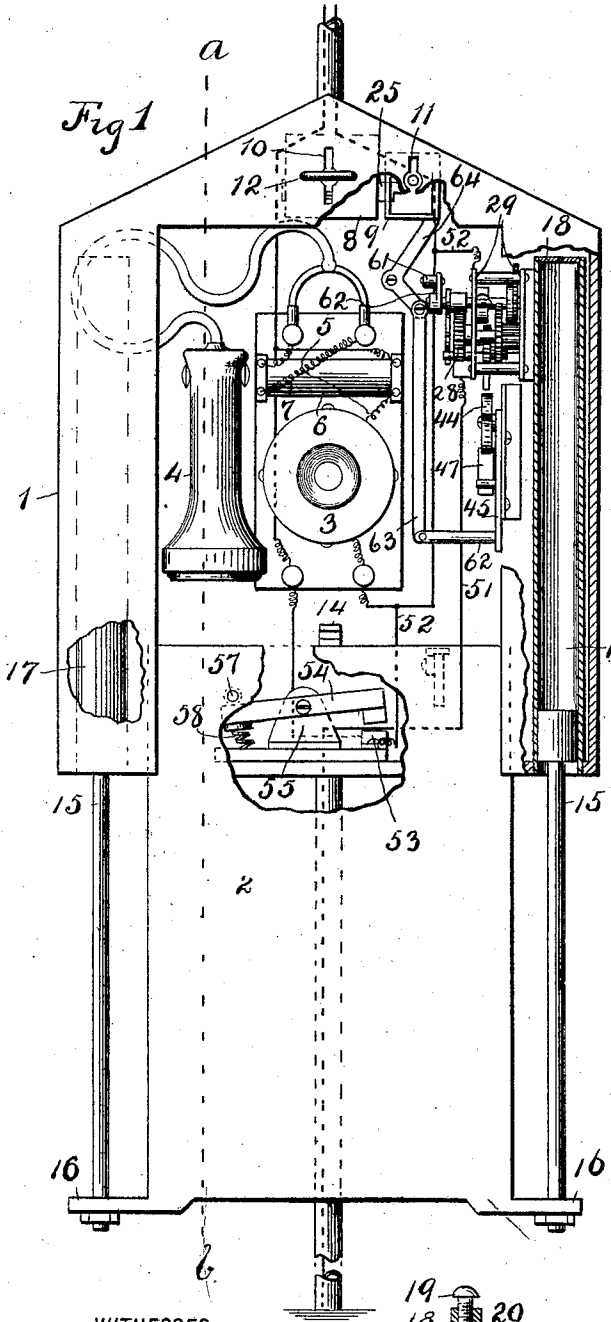


Fig 2

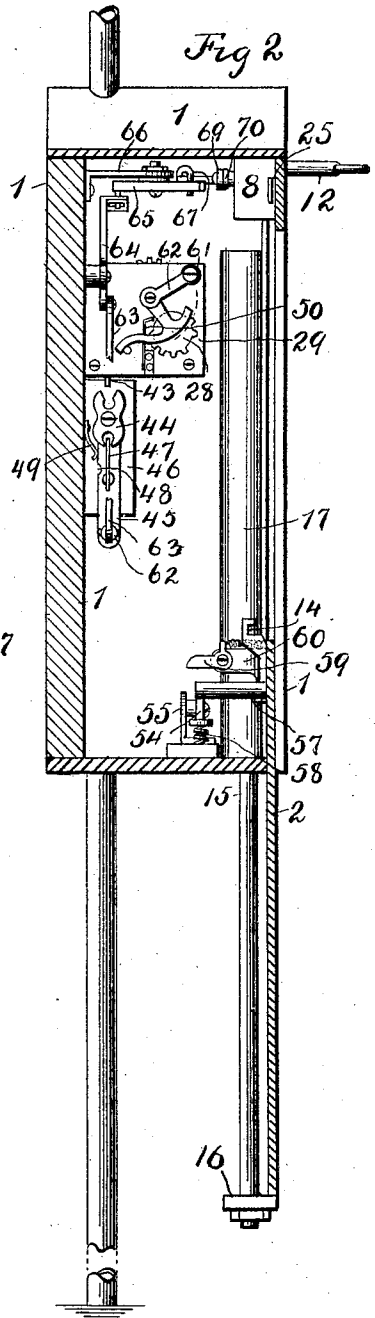
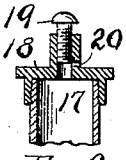


Fig 3



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4 SHEETS—SHEET 2.

Fig 4

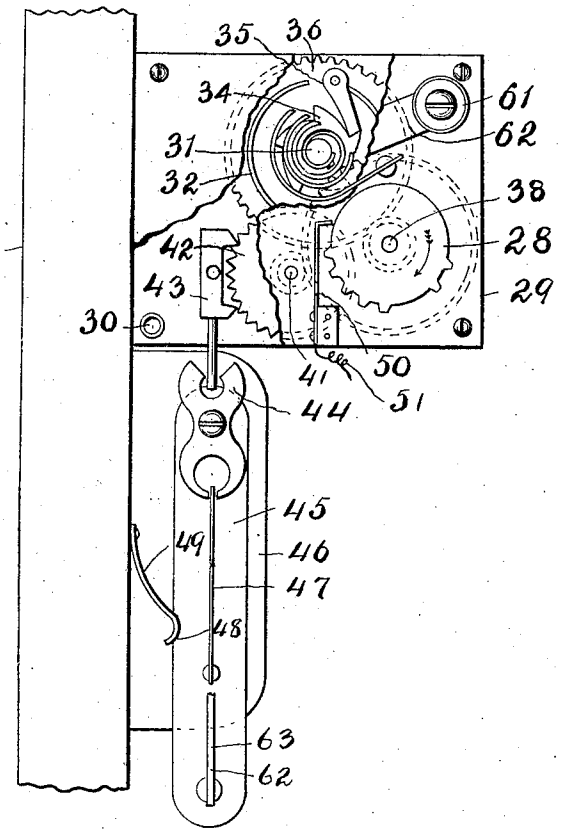
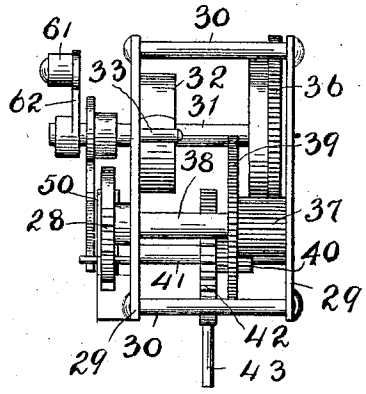


Fig 5



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4 SHEETS—SHEET 3.

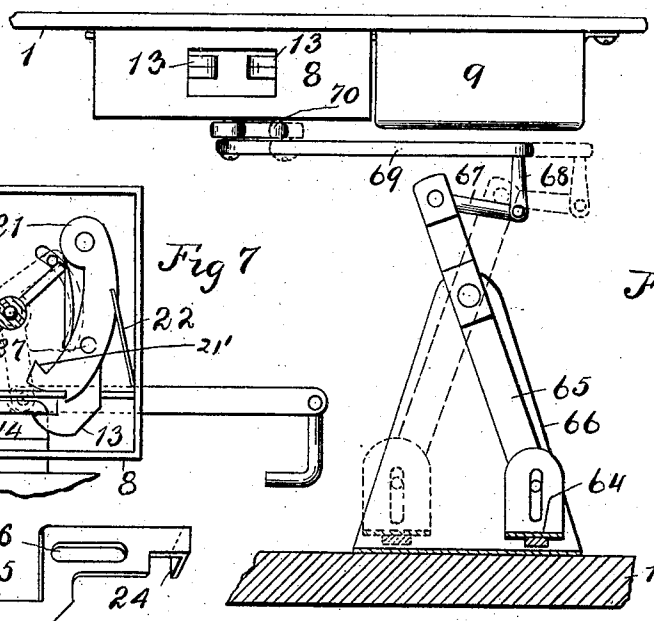

Fig 6

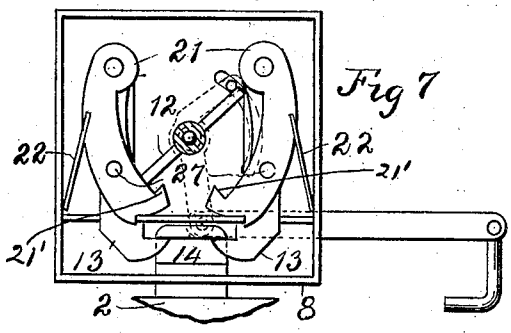

Fig 7

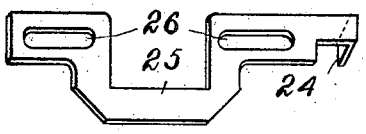

Fig 8

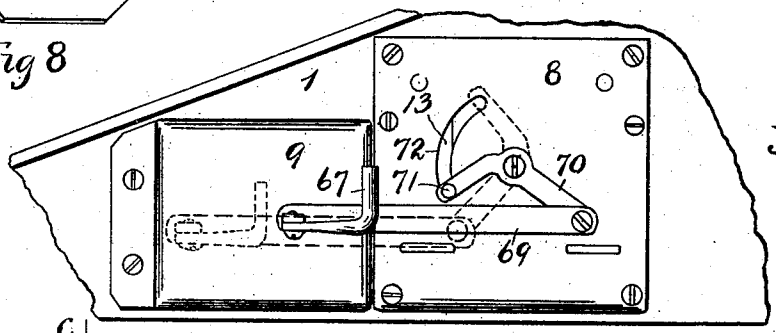

Fig 9

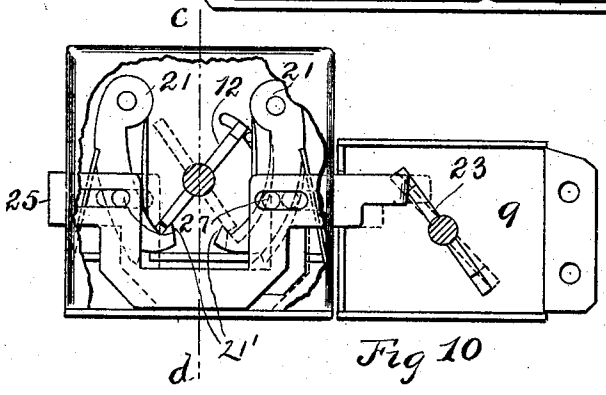

Fig 10

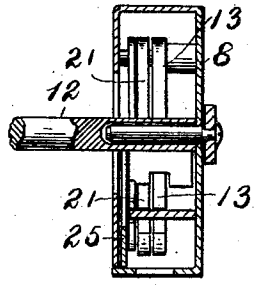

Fig 11

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APPLICATION FILED JULY 7, 1902.

4 SHEETS—SHEET 4.

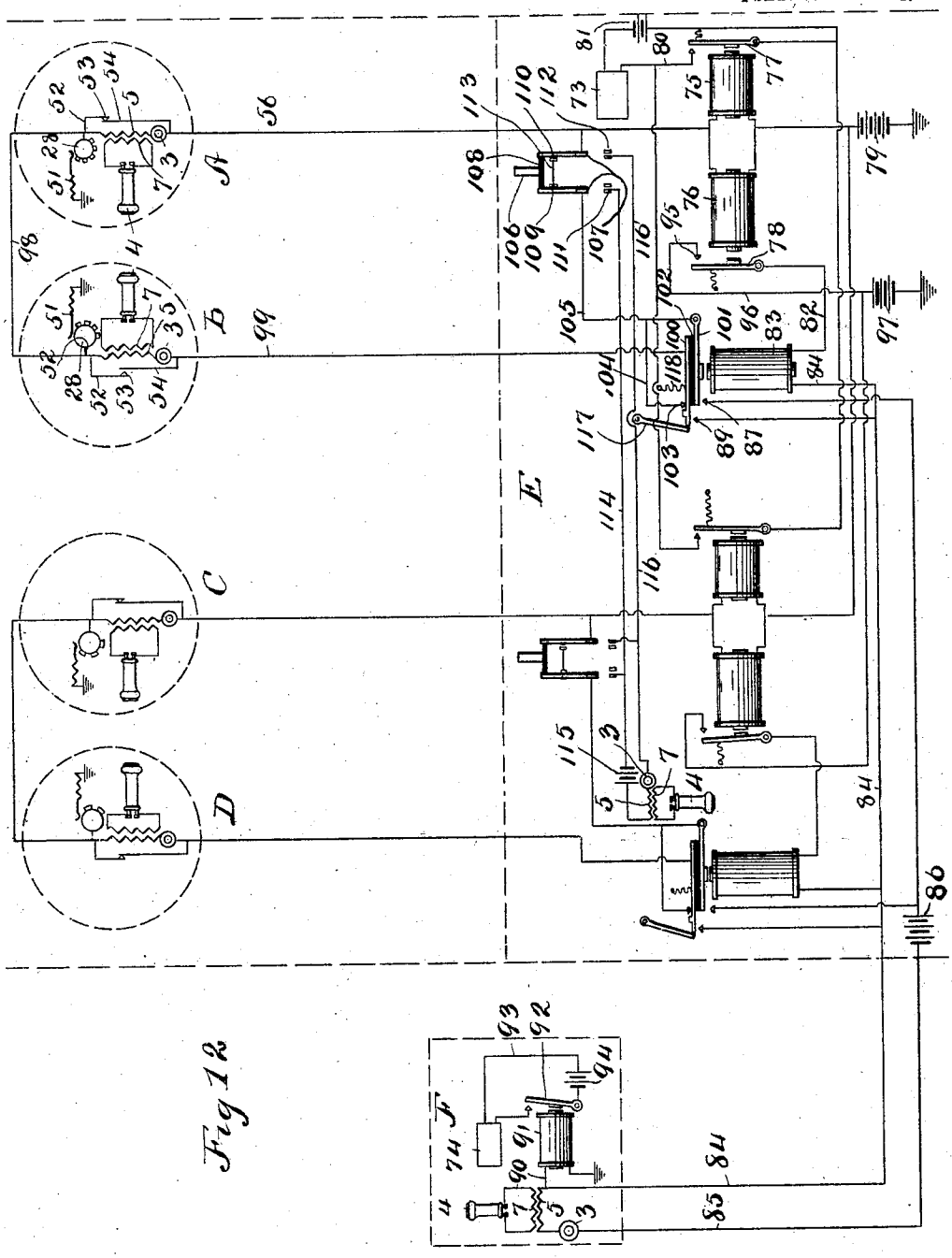

Fig 12

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UNITED STATES PATENT OFFICE.

WILLIAM CONDON, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO ALBERT BARRETT, OF KANSAS CITY, MISSOURI.

FIRE AND POLICE SIGNALING SYSTEM.

No. 848,636. Specification of Letters Patent. Patented April 2, 1907.

Application filed July 7, 1902. Serial No. 114,578.

To all whom it may concern:

Be it known that I, WILLIAM CONDON, a citizen of the United States, residing in Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Fire and Police Signaling Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to police and fire signal systems.

The object of my invention is to provide a signal system by means of which a station on an outlying circuit may communicate telephonically or by automatic signals with either or both of two receiving-stations, such as the police and fire departments of a city.

A further object of my invention is to provide a signal system in which each outlying station on a circuit is provided with a signal-transmitting device capable of transmitting two kinds of signals over the circuit and two receiving devices in the said circuit, one of which responds to both kinds of signals and the other responding to but one of the two kinds of signals sent.

My invention provides, further, registering devices at both receiving-stations, together with means by which one of the registering devices is actuated by either of two receiving devices and the other registering device is actuated only when the receiving device responds which is responsive to only one of the two kinds of signals.

My invention provides, further, a supplemental circuit connecting the two receiving-stations and means by which only certain of the two kinds of signals are repeated over the supplemental circuit.

My invention provides, further, means by which the supplemental circuit may automatically be connected with the main circuit when the receiving device responds which is responsive to only one of the two kinds of signals sent over the main circuit.

My invention provides, further, a transmitting device adapted to transmit the same signal at two rates of speed and two receiving devices connected with the transmitting device by a suitable electrical conductor, one of the receiving devices responding to both fast and slow signals and the other responding to signals sent at but one rate of speed.

My invention provides other peculiarities and features of novelty hereinafter fully described and claimed.

In the drawings, which illustrate my invention, Figure 1 is a front elevation view of one of my improved signal-boxes, portions of which are broken away to better disclose the parts contained therein. In this view the door is shown in the fully-open position. Fig. 2 is a vertical sectional view taken in the dotted line *a b* of Fig. 1. Fig. 3 is a central vertical sectional view of the upper end of a modified form of one of the air-chambers connected with the mechanism for controlling the falling speed of the door. Fig. 4 is a side elevation view of the train of gearing and speed-regulating mechanism connected therewith, portions being broken away to show the inner parts of the train. Fig. 5 is a side elevation view of the train of gearing. Fig. 6 is an end view of the two lock-boxes and a portion of the mechanism which controls the action of the train of gearing looking from the bottom end of the box toward the top. Fig. 7 is a plan view of the lock engaged with the door-catch and the key inserted. Fig. 8 is a perspective view of the slide-plate operated by the master-key. Fig. 9 is a rear view of the lock-boxes and a portion of the signal-box. Fig. 10 is a front view of the same with a portion of the lock-casing broken away. Fig. 11 is a section taken on the dotted line *c d* of Fig. 10. Fig. 12 is a diagrammatic view of the different circuits, together with the different apparatuses used in connection therewith.

Similar numerals of reference indicate similar parts.

1 indicates a signal-box, of which one should be placed at each outlying station.

2 indicates the door of the signal-box, the door being preferably slidable in suitable ways provided in the box and preferably falling by gravity in opening. Within the box is placed a transmitter 3 of any desirable type for transmitting telephonic currents over the circuit which connects the station with the receiving-station. The disposition of the circuits is described hereinafter. The signal-box also contains a telephone-receiver 4 of any desirable style. The telephone-transmitter 3 is connected, preferably, in series with the primary wire 5 of an induction-coil 6, the secondary wire 7 of which is in series with the receiver 4. The primary

wire of the induction-coil is in series with the circuit in which is located the signal-box 1. Access to the telephone receiver and transmitter is to be had when the door 2 is in the open position.

8 and 9 indicate, respectively, two lock-boxes secured to the inner side of the signal-box 1 above the door 2. The signal-box is provided in its front side opposite the lock-boxes 8 and 9 with two keyholes 10 and 11, respectively, adapted to receive therein the operating-keys, one of which, 12, is shown in position in the box 8. In the lock-box 8 are pivotally mounted two tumblers 13, the lower ends of which are adapted to engage with a catch 14 on the inner upper side of the door 2. When the key 12 is inserted in the hole 10, as shown in Fig. 7, and turned either to right or left, the tumblers 13 are released from the catch 14 and the door 2 is permitted to fall by gravity to the position shown in Figs. 1 and 2.

To prevent the door 2 from falling too rapidly, it has connected to it two plungers 15, secured, respectively, to the two lugs 16, provided one at each side of the door at its lower end. The plungers 15 are respectively mounted in two vertical tubes 17, the upper ends of which are provided each with a cap 18, having a small opening for the escape of the air contained in the tubes. In the form shown in Fig. 3 the cap 18 is provided with a central screw-threaded hole in which is mounted a screw 19, adapted to close more or less a lateral hole 20, communicating with the central hole in the cap. In the lock-box 8 are placed also the two tumblers 21, normally held in the path of the operating-key by the springs 22. These two tumblers serve to prevent the withdrawal of the operating-key from the box 8 after it has been inserted therein through the hole 10 and turned far enough to engage the tumblers 21. The ordinary operating-key only is made so as to engage the tumblers 21 and be held in the lock-box thereby by means of projections 21′, one on the inner edge of each of said tumblers near its outer or free end. A master-key that will engage only the tumblers 13 is also provided, which when inserted will actuate the tumblers 13 and release them from the catch 14 on the door 2. A further function of the master-key is to release the key 12 from engagement with the tumblers 21 after the key 12 has been inserted and turned in the lock 8.

In Fig 10 the master-key 23 is shown in position in the lock-box 9. The said key is adapted in this position to engage the projection 24 on the end of a horizontal slide-plate 25, which extends through the side of the box 9 and the adjacent side of the box 8. The slide-plate 25 is provided with two longitudinal slots 26, in which are inserted, respectively, the pins 27, with which the tumblers 21 are provided. By turning the master-key against the projection 24 the slide-plate is so moved lengthwise as to force the left tumbler 21, as shown in Fig. 10, to the left, thus releasing the key 12, which is shown engaged with the said tumbler. If the key 12 had been turned to the position indicated in this figure by dotted lines, thus engaging the right tumbler 21, then the key 23 should be turned in the box 9 so as to engage the other side of the projection 24 and force the plate 25 and right tumbler 21 to the right, thus releasing the key 12. In the signal-box 1 and connected with the circuit which leads to the central receiving-station, as described hereinafter, is a signal-transmitting device adapted to transmit two kinds of signals over the circuit. The two kinds of signals comprise the same arrangement of dots and dashes, but sent at different rates of speed.

The signal-transmitting device comprises, preferably, a rotatable contact or make-and-break wheel 28, which is driven by a spring-actuated train of gears, the spring actuating the same being wound up by the falling of the door 2. The train comprises two parallel plates 29, connected by transverse rods 30, the plates 29 being secured in any desirable manner to the back of the signal-box 1. Referring particularly to Figs. 4 and 5, 31 indicates the driving-shaft of the train, rotatably mounted in bearings provided in the plates 29. A spring 32 is connected to the shaft 31 at one end and to the pin 33 at the other end, the pin 33 being secured to one of the plates 29. Rotatable with the shaft 31 is a ratchet-wheel 34, in which rests a pawl 35, pivoted to a spur gear-wheel 36, rotatable on the shaft 31. The gear 36 meshes with a pinion 37, rotatable with a shaft 38, mounted in the plates 29 and having secured to it a spur gear-wheel 39, which meshes in a pinion 40, rotatable with a shaft 41, having secured thereto a scape-wheel 42 and mounted between the plates 29. Pivoted between the plates 29 is a plate 43, provided at each end with pallets adapted to consecutively engage the teeth of the scape-wheel and stop its rotation. The plate 43 is provided with an arm adapted to enter a recess in a pivoted plate 44, mounted on a slidable plate 45, which is longitudinally movable on a plate 46, secured to the back of the signal-box 1. Lateral movement of the plate 44 is regulated by a flat spring 47, one end of which enters a recess in the plate 44 opposite to the end which engages the arm on the plate 43, the other end of the spring 47 being secured to the slidable plate 45. In one edge of the plate 45 is a notch 48, in which is adapted to fit the free end of a spring 49, the other end of which is secured to the back of the signal-box 1. On the left outer end as viewed in Fig. 5 of the shaft 38 is mounted the con-

tact-wheel 28, which is preferably a wheel provided with peripheral teeth on which is adapted to bear when the wheel is rotated a spring-arm 50, which is connected by a wire 51 with the earth.

The contact-wheel 28 is connected, through the train-frame and shafting by the wire 52, with a contact 53, secured to the bottom of the signal-box 1 and adapted to have normally rest upon it a pivoted contact-arm 54, pivoted to a vertical plate 55, insulated from the contact 53 and connected with the wire 56, which forms part of the circuit in which the station is located. On the rear side near the upper end of the door 2 is a rearwardly-extending post 57, which is adapted when the door falls to bear upon the left end of the contact-arm 54 and cause it to break contact with the contact-plate 53. A coil-spring 58 normally bears upon the said left end of the contact-arm 54 and causes it to renew contact with the contact-plate 53 as soon as the door 2 is raised.

As shown in Fig. 2, on the rear side of the door near the upper end is a bracket 60, to which is pivoted a pawl 59, which is adapted to engage, when the door falls, a roller 61 on the outer end of an arm 62, secured to the driving-shaft 31 of the train. As the door 2 falls the pawl 59 bears upon the roller 61, pulling it downward and winding the spring 32 of the train, which when the pawl 59 becomes disengaged from the roller 61 causes the shaft 31 to rotate and through the intermediacy of the gearing already described causes the contact-wheel to rotate under the spring-arm 50, thereby permitting electrical impulses to pass over the circuit through the contact-wheel 28 to ground. The speed of rotation of the contact-wheel 28 is faster when the slidable plate 45 is so moved as to disengage the pivoted plate 44 from the arm on the pallet-plate 43. When the said pallet-plate is engaged by the pivoted plate 44, the spring 47 retards the swinging of the plate 44, and this in turn resists the lateral movement of the plate 43, thus causing the train to run slower and slowing the rate of speed of rotation of the contact or make-and-break wheel 28. The manner of changing the rate of speed of rotation of the wheel 28 by movement of the key in the lock-box 8 is best illustrated by referring to Figs. 1, 2, 6, and 7.

On the slidable plate 45 is mounted a post 62, to which is pivoted one end of a vertical link 63, the other end of which is pivoted to a bell-crank lever 64, pivoted at its angle to the back of the signal-box 1. The other arm of the said lever is pivoted to a horizontal arm 65, pivoted to a horizontal plate 66, secured to the back of the signal-box. The other end of the arm 65 is pivoted to a link 67, connected also to a post 68, secured to one end of an arm 69, the other end of which is pivoted to one arm of a bell-crank lever 70, the other arm of which has secured to it a post 71, adapted to be moved forward and backward in an arcuate slot 72 in the rear side of the lock-box 8 and extending into the lock far enough to engage a key inserted in the said lock-box through the keyhole 10. The bell-crank lever 70 is pivoted to the rear side of the lock-box 8. By inserting a key into the lock-box 8 and turning in the proper direction to right or left, as the case requires, the bell-crank lever 70 may be swung to right or left and through the mechanism described move the plate 45 upward or downward, and thus causing engagement with or disengagement from of the plate 44 with the arm of the pallet-plate 45. As already described, movement upward and downward of the plate 45 through the pallet-plate 43 and pivoted plate 44 regulates the speed of the train to one of two rates. Thus when the operator turns the key in one direction in the lock-box 8 in opening the door the impulses sent over the circuit by the transmitting device will be at one rate of speed, and by turning the key when inserted in the other direction in the lock-box 8 the transmitting device will send electrical impulses at a different rate of speed.

Referring now particularly to Fig. 12, the dotted circles A, B, C, and D indicate each an outlying station. The space set off by straight dotted lines and indicated by E represents the main receiving-station or police-department. The smaller space set off by straight dotted lines and indicated by F represents the supplemental receiving-station or fire-department. At each station A, B, C, and D is located a signal-box with the apparatus contained therein already described. As stated, each signal-station is provided with means for transmitting to station E two kinds of signals, all of which are recorded on a registering device of the ordinary construction and indicated by 73. 74 indicates a similar registering device located at station F. The stations A and B are located in one outlying circuit, and the stations C and D are located both on another outlying circuit. There may be as many outlying circuits as desired, and there may be as many stations on each of said circuits as can be accommodated on the circuit. Each outlying circuit has provided for it at station E two receiving devices, one of which responds to all signals passing over the circuit and the other responding to only one kind of signals. Means are also provided by means of which when any signal passes over either of the outlying circuits it will be registered at station E on the register 73. Means later to be described are also provided by which the register 74 at station F records all signals, which cause the receiving device to respond which is responsive to only one kind of signals.

The preferable form of receiving devices with which each outlying circuit is provided

at station E comprises two magnets 75 and 76, respectively provided with the armatures 77 and 78, respectively. The line-wire 56, which is connected at one end with the transmitter 3 at station A, is connected at its other end in multiple with the electromagnets 75 and 76 and also through the battery 79 with the ground. The magnet 75 and the armature 77 form an ordinary relay mechanism, the armature serving to make and break a local circuit 80, in which is located the register 73 and a local battery 81. When the magnet-armature 77 is closed, the current passes from the battery 81 to and through register 73, thence through armature 77, and thence to the battery 81, the said register, battery, armature, and wires connecting them forming the circuit 80. The other magnet 76 and armature 78 form also an ordinary relay mechanism the armature 78 of which serves to make and break the supplemental circuit which connects the station F with station E. This circuit begins at the armature 78, then extends by wire 82 to and through electromagnet 83, thence by wire 84 to and through the primary wire 5 of an induction-coil located at station F, thence through telephone-transmitter 3 at station F to and through wire 85 and battery 86 to contact 87. A wire 88 leads from wire 84 to contact 89. At station F the wire 84 connects with the ground through wire 90 and electromagnet 91. The armature 92 of the magnet 91 makes and breaks a local circuit 93, in which is located a battery 94 and register 74.

The armature 78 at station E connects with the ground through contact 95, wire 96, and battery 97. Whenever the armature 78 strikes the contact 95, a current is caused to pass from battery 97 over wire 96, through contact 95 to and through armature 78, thence through wire 82 to and through magnet 83, thence through wire 84 to and through magnet 91 by way of wire 90, and from magnet 91 to ground. The energizing of the electromagnet 91 operates the armature 92 and repeats by the action of the battery 94 through the local circuit 93 the signals sent through the magnet 91.

The outlying circuit in which the stations A and B are located is completed from wire 56 through the primary wire 5 at station A, as already stated, thence by wire 98 to and through primary wire 5 at station B, if there should be more than one station on the outlying portion of the circuit, thence by telephone-transmitter 3 at station B to and through wire 99 to conducting-plate 100, carried by the pivoted armature 101, but insulated from it by the insulation 102, thence by conducting-plate 100 to contact 103, wires 104 and 105 to and through an ordinary switch 106, when in the position shown in Fig. 12, to the wire 56. The switch 106 comprises, preferably, a lever provided with two arms 107, insulated from each other by the cross-piece 108. One of the arms is connected to the wire 105 and the other to the wire 56. Four contacts 109, 110, 111, and 112 are adapted to be connected to the arms 107 when the lever is properly thrown. Two of the contacts 109 and 110 are connected together by a wire 113. The contacts 111 and 112 are connected as follows: line 114, battery 115, induction-coil primary wire 5, transmitter 3, and wire 116, which connects with contact 112. A telephone-receiver 4 in a local circuit with the secondary wire of the induction-coil at station E permits telephone messages passing over lines 114 and 116 to be heard by the operator at station E.

The function of the switch 106 is to permit the operator at E to place his telephone-transmitter 3 and induction-coil 5 in circuit with the outlying stations A, B, C, or D when the switch is thrown so as to make contacts with the contacts 111 and 112; but for this purpose the wire 105 could be connected directly with wire 56. By throwing the lever of the switch 106 the operator at station E places his telephone-circuit just described into circuit with the stations on either of the outlying circuits. By throwing the lever so that the arms 107 of the lever have contact with the contacts 111 and 112 the operator places his transmitter in the main circuit. By throwing the lever so the arms make contact with the contacts 109 and 110, as shown, he cuts his telephone out of circuit. The armature 101 is pivoted adjacent to the magnet 83, so as to be attracted by it when the magnet 83 is energized by a current passing through it. When this occurs, the armature is drawn toward the said magnet, thus breaking connection with contact 103 and making connection between contacts 87 and 89 and the armature 101 and the conducting-plate 100, respectively. When such connection occurs, the pivoted arm 117 drops over the armature 101 into the notched end of the plate 100 and holds the plate 100 and armature 101 in contact with the contacts 89 and 87, respectively, thus connecting the circuit in which is located the station F with the circuit in which are located stations A and B. After the pivoted arm 117 is withdrawn from the plate 100 the spring 118, connected to the plate 100, draws the armature back to its original position, as shown in the drawings.

The station F is provided with a telephone-receiver 4, connected in circuit with the secondary wire 7 of an induction-coil, to which the primary wire 5, connected to the wire 84, belongs. Each station A, B, C, and D is similarly provided with telephone-receivers, each located in a circuit containing the secondary wire of the induction-coil located at the said station. The electromagnet 75 of each receiving device located at station E is so constructed as to respond to both the slow

and fast signals passing through the said magnet, but the electromagnet 76 is made with a core so long that the fast electrical impulses passing through it from the line 56 will not, owing to the magnetic lag of the magnet 76, sufficiently energize it to enable it to bring the armature 78 against the contact connected with the wire 95. It is made, however, so as to respond to the slow impulses. Therefore when it is desired to send a fire-alarm the operator at any given station A, B, C, or D causes the transmitting device at his station to transmit only the slow impulses, which are recorded at both the station E and station F on the registers 73 and 74, respectively.

I will now describe the manner of operating my invention. Any one desiring to send a signal from a signal-box, say at station B, inserts a key 12 into the lock-box 8. If he wishes to be connected with only the station E, he turns the key in a direction such that the pivoted plate 44 will, through the mechanism described hereinbefore, be moved out of the path of movement of the arm on the pallet-plate 43, thus permitting the train to run at the fast speed, thus permitting the circuit to be connected through the contact-wheel 28 at the fast rate of speed. As soon as the key is turned as stated the tumblers 21 engage the key and hold it trapped until the master-key is inserted in the lock-box 9 and causes its release, as already described. When the key is turned in the lock-box 8, the tumblers 13 are released from the catch 14 on the door and the door falls by gravity. In falling it winds the spring of the train by pulling down the arm 62, having thereon the roller 61. As soon as the said arm is released from the catch 14 the spring causes the train to rotate the contact-wheel 28, so that the contact-wheel will be connected with the line-wire by striking the spring-plate 50. As the contact-wheel in this instance is rotated at the fast speed, the contacts of the spring 50 and the teeth of the contact-wheel will be short and close together. The resulting impulses which pass over the circuit and through the magnets 75 and 76 will therefore be short and rapid and will affect only the armature 77, thus actuating the register 73 and indicating to the operator at station E that station B desires connection telephonically. The operator at station E then throws the switch so as to place the transmitter 3 and receiver 4 at his station in circuit with the circuit including station B. In the meantime the door 2 at station B continues to fall, being retarded by the plungers 15 in the tubes 17 and finally striking the arm 54 through the post 57 and removing the arm 54 from contact with the contact 53. The telephone-transmitter 3 at station B is then not short-circuited and the operator at that station may take out the receiver from the signal-box and converse with the operator at station E.

When the operator at station E has finished, he replaces the receiver 4 and pushes the door 2 upward until the catch 14 thereon is caught by the tumblers in the lock-box 8. The operator at station E then throws the switch so that its arms have contact with the contacts 109 and 110. The apparatus is then ready for another signal transmission.

If the operator at station B desires to send in a fire-alarm direct to the fire-alarm station at station F, he proceeds in exactly the same manner as just described, excepting that he turns the key 12 in the opposite direction in the lock-box 8. The plate 44 will then be caused to engage the arm of the pallet-plate 43, thus causing the train to run slow and cause the contact-wheel 28 to transmit the slow impulses over the circuit. As these impulses pass through the magnets 75 and 76 both magnets become energized sufficiently to attract their respective armatures against their opposing contacts. The signals will thus be registered on the register 73. The magnet 76 being energized will cause the armature 78 to have contact with the contact 95 in the line 96, thus permitting the current to flow from the battery 97 through the magnet 91 at station F, and thus causing the signals to be registered on the register 74 through the battery 94, armature 92, and wire 93. At the same time the magnet 83, through the armature 101 and plate 100, will connect the outlying circuit in which B is located with the circuit in which the station F is located. Telephonic communication may thus be established between the station B and station F without the intervention of the operator at station E. After the communication has been finished, which the operator at station E may determine by looping in his telephone apparatus, as already described, the operator at station E withdraws the pivoted arm 117 from the notched end of the plate 100, and the spring 118 again breaks the contact of the armature 101, plate 100, and the contacts 87 and 89. For each outlying circuit a duplicate of the apparatus described as being connected with the circuit in which are located stations A and B is required at station E, excepting the register 73, batteries 97 and 79, and the telephone set. These latter articles need not be duplicated, but are connected with each additional outlying circuit in the same manner as described with relation to the circuit in which are located stations A and B.

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

1. In a signal system, the combination with an electrical circuit, of means for transmitting over said circuit electrical impulses at two rates of speed, two receiving devices

located in the said circuit one of said receiving devices being responsive to the said impulses at both rates of speed, and the other responsive to the impulses at the slower rate of speed, a second electrical circuit normally disconnected from the first circuit, and means for connecting the two said circuits together when the receiving device is actuated which responds to the slower impulses, substantially as described.

2. In a signal system, the combination with an electrical circuit, of a plurality of transmitting devices located in said circuit, means by which each of said signal-transmitting devices may transmit impulses over the said circuit at two rates of speed, two receiving devices located in said circuit, one of said receiving devices being responsive to the said impulses at both rates of speed, and the other of said receiving devices responding to only the slower impulses, a second electrical circuit normally disconnected from the first circuit, and means by which the two circuits are connected when the receiving device is actuated which responds to the slower impulses, substantially as described.

3. In a signal system, the combination with a plurality of electrical circuits, of a plurality of signal-transmitting devices located one in each of said circuits, means by which each of said transmitting devices may transmit over the circuit in which it is located electrical impulses at two rates of speed, a plurality of receiving devices located two in each of said circuits, one of each of said two receiving devices being responsive to the impulses sent at both rates of speed, and the other of each of said two receiving devices being responsive to only the slower impulses, a supplemental electrical circuit normally disconnected from the other circuits, and means by which the supplemental circuit may be connected with any of the other circuits when the receiving device located therein and responsive only to the slow impulses is actuated, substantially as described.

4. In a signal system, the combination with a plurality of electrical circuits, of a plurality of signal-transmitting devices located in each of said circuits, means by which each of said signal-transmitting devices may transmit over the circuit in which it is located electrical impulses at two rates of speed, a plurality of receiving devices located two in each of said circuits, one of each of said receiving devices being responsive to impulses sent at both rates of speed, and the other of said receiving devices being responsive to only the slower impulses, a supplemental electrical circuit normally disconnected from the other circuits, and means by which the said supplemental circuit may be connected with any of the other circuits when the receiving device located therein and responsive to only the slower impulses is actuated, substantially as described.

5. In a signal system, the combination with an electrical circuit, of means for transmitting electrical impulses over the said circuit at two rates of speed, two receiving devices located in the said circuit, one of said receiving devices being responsive to the said impulses at both rates of speed, and the other receiving device responding to only the slower impulses, a registering device, means by which the said registering device is actuated when either of the said receiving devices responds, a supplemental circuit normally disconnected from the first circuit, means for connecting the supplemental circuit with the first circuit when the receiving device which responds to only the slower impulses is actuated, a second registering device, and means for actuating the second registering device when impulses are sent over the supplemental circuit, substantially as described.

6. In a signal system, the combination with an electrical circuit, of a plurality of signal-transmitting devices located in the said circuit, means by which each of said signal-transmitting devices may transmit over the said circuit electrical impulses at two rates of speed, two receiving devices located in said circuit, one of said receiving devices being responsive to the said impulses at both rates of speed, and the other of said receiving devices being responsive only to the slow impulses, a registering device, means by which said registering device is actuated when either of said receiving devices responds to the electrical impulses, a supplemental circuit normally disconnected from the first circuit, means by which the supplemental circuit is connected with the first circuit when the receiving device is actuated which responds only to the slower impulses, a second registering device, and means for actuating the said second registering device when impulses are sent over the supplemental circuit, substantially as described.

7. In a signal system, the combination with an electrical circuit, of means for transmitting electrical impulses over the said circuit at two rates of speed, two receiving devices located in the said circuit, one of the said receiving devices being responsive to the impulses at both rates of speed, and the other receiving device responding to only the slower impulses, a registering device, means for actuating the registering device when either of the receiving devices responds, a supplemental circuit, means by which electrical impulses corresponding to the said slower impulses are sent over the supplemental circuit when the receiver is actuated which responds only to the slower impulses, a second registering device for registering the impulses sent over the supplemental circuit,

means for connecting the two circuits together, and means for causing telephonic currents to traverse both circuits, substantially as described.

8. In a signal system, the combination with an electrical circuit, of a station provided with a signal-transmitting device adapted to be connected with the said circuit, means by which the said transmitting device may transmit electrical impulses over the circuit at two rates of speed, a receiving-station provided with two receiving devices, one of which is responsive to the impulses sent at both rates of speed, and the other responsive to only the slower impulses, a registering device at the receiving station which is actuated when either of the receiving devices responds, a supplemental receiving station provided with a registering device, a circuit connecting the first receiving station with the supplemental station and connected with the register at the latter station, means at the first receiving-station for causing electrical impulses corresponding to the said slower impulses to traverse the circuit connecting the two receiving-stations, means at the first receiving-station for connecting the two circuits together and actuated by the receiving device which responds only to the slower impulses, and means provided at each station for permitting telephonic communication between the different stations over the connecting circuits, substantially as described.

9. In a signal system, the combination with a signal-box provided with a door, of a signal-transmitting device, means by which the opening of the said door causes the said signal-transmitting device to be operated, a lock in the box for holding the door in the closed position, and means connected with the lock by which when the key is inserted therein and turned in one direction the signal-transmitting device will be operated at one rate of speed, and when the key is turned in the lock in the other direction the signal-transmitting device will be operated at a different rate of speed, substantially as described.

10. In a signal system, the combination with a signal-box provided with a door, a key and a lock for securing the door in the closed position, of a rotatable contact-wheel means by which the opening of the door causes the said wheel to rotate, means by which the wheel may be made to rotate at two rates of speed, and means by which the rate of speed of rotation of the wheel is controlled by the direction the key is turned in the said lock, substantially as described.

11. In a signal system, the combination with a signal-box provided with a door, a lock for securing the door and a key for the lock, of a train of gears, a spring for driving the same, a contact-wheel rotated by the said train, means by which the train-spring is wound when the door is opened, means for changing the speed at which the train is driven, and means connected with the lock by which the changing of speed of the train is controlled by the direction in which the key is turned in the lock, substantially as described.

12. In a signal system, the combination with a signal-box provided with a door and a lock for keeping the door in the closed position, the lock being adapted to receive a key for the purposes of unlocking the same and releasing the door, of a movable make-and-break device actuated by the opening of the said door, and means controlled by the movement of the key in the lock for determining the speed of movement of the make-and-break device, substantially as described.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

WILLIAM CONDON.

Witnesses:
WARREN D. HOUSE,
G. W. DUVALL.