Oct. 26, 1943. K. L. BELL 2,332,774

SIGNALING APPARATUS WITH VISUAL DISPLAY FOR FIRE ALARMS AND THE LIKE

Filed April 25, 1940 4 Sheets-Sheet 1

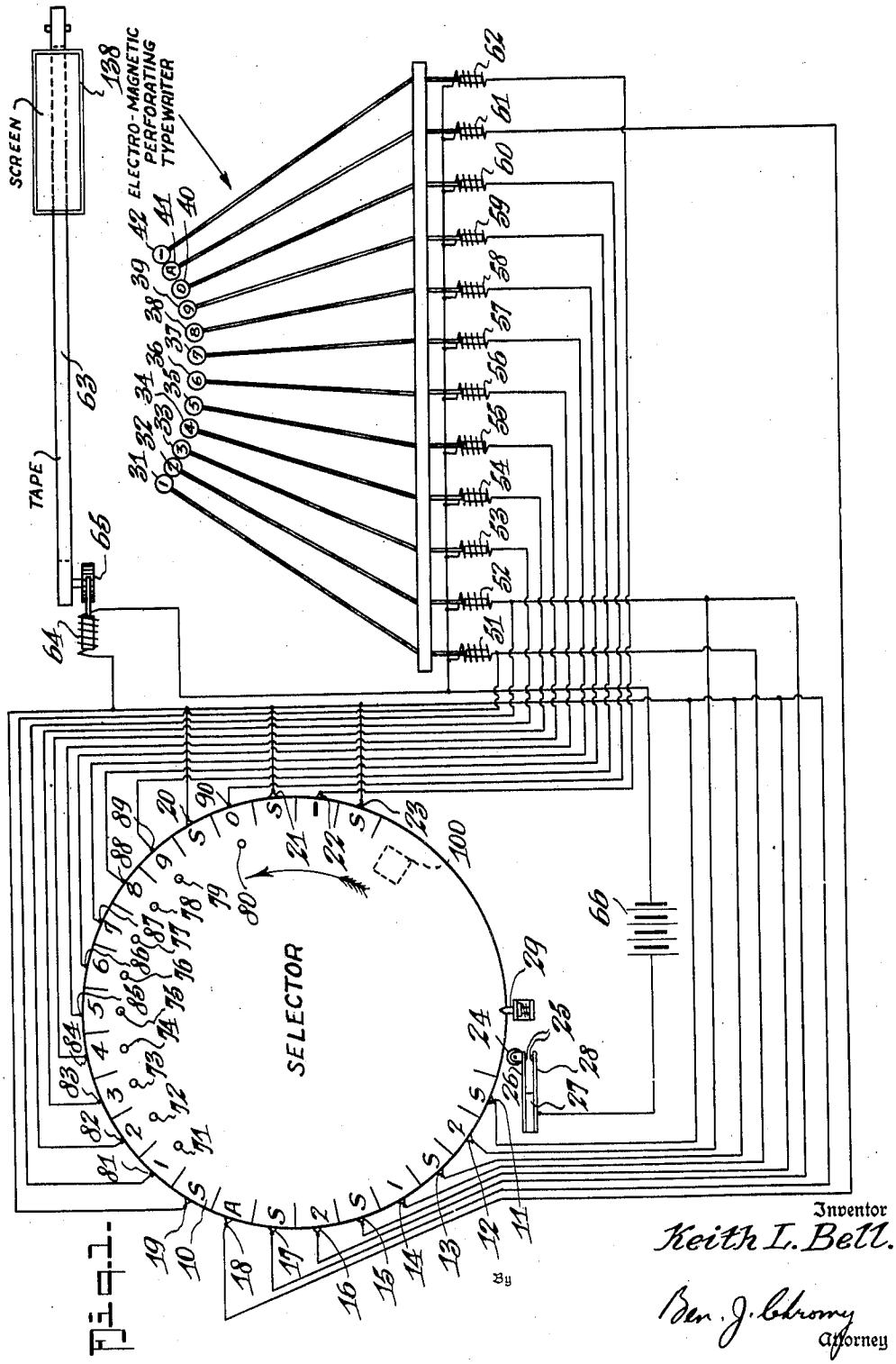


Fig. 1.

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SIGNALING APPARATUS WITH VISUAL DISPLAY FOR FIRE ALARMS AND THE LIKE

Filed April 25, 1940 4 Sheets-Sheet 2

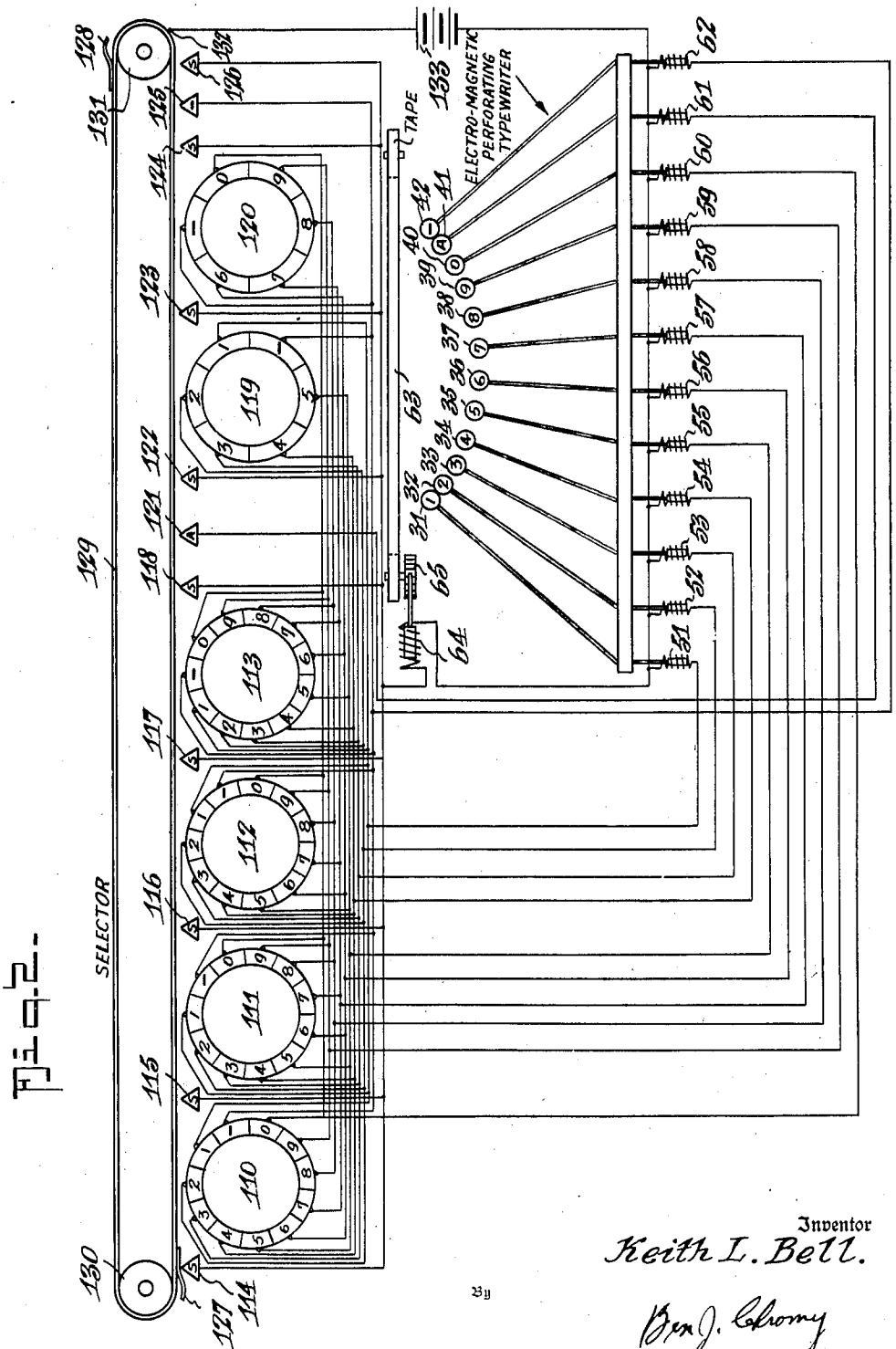


Fig. 2.

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SIGNALING APPARATUS WITH VISUAL DISPLAY FOR FIRE ALARMS AND THE LIKE

Filed April 25, 1940 4 Sheets-Sheet 3

Fig. 3.

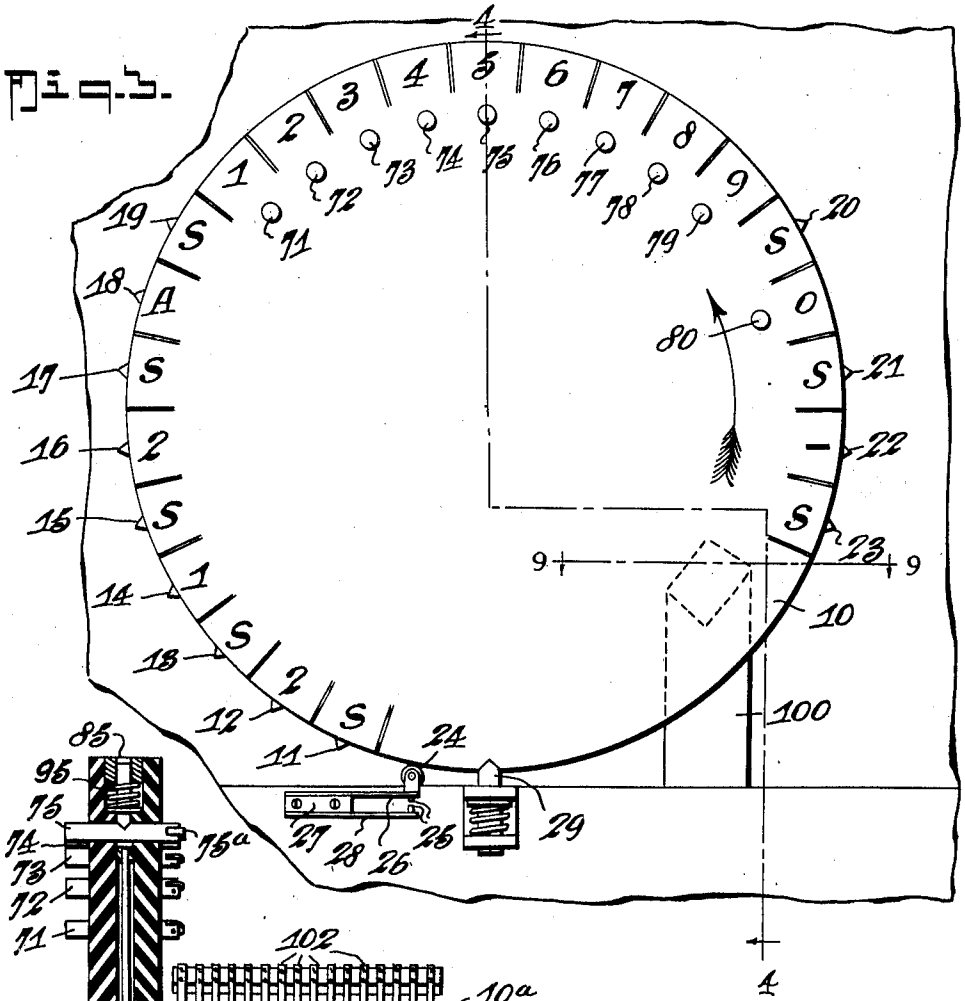


Fig. 4.

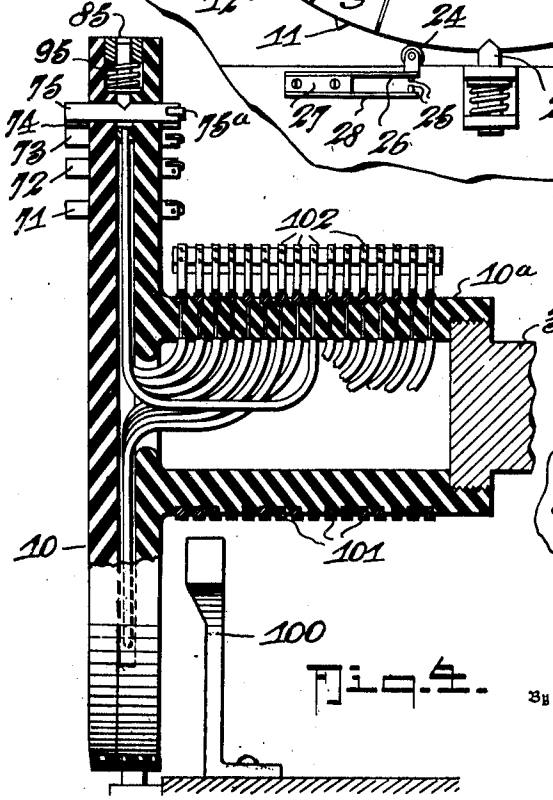
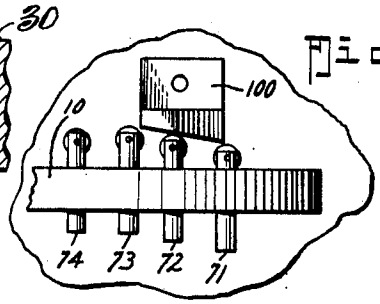


Fig. 3.



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SIGNALING APPARATUS WITH VISUAL DISPLAY FOR FIRE ALARMS AND THE LIKE

Filed April 25, 1940 4 Sheets-Sheet 4

Fig. 5.

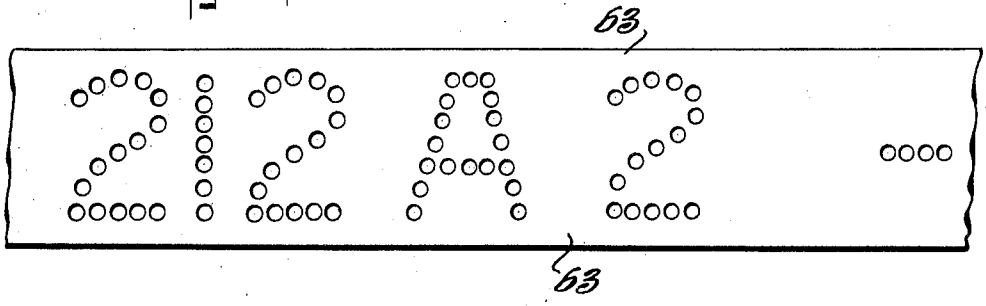


Fig. 6.

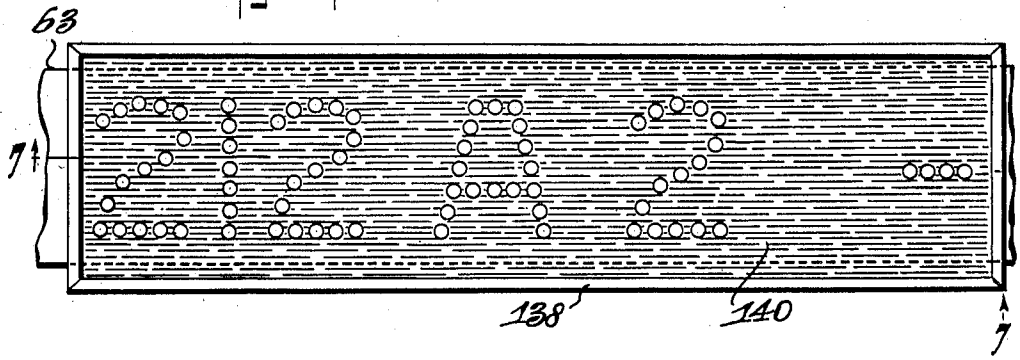


Fig. 7.

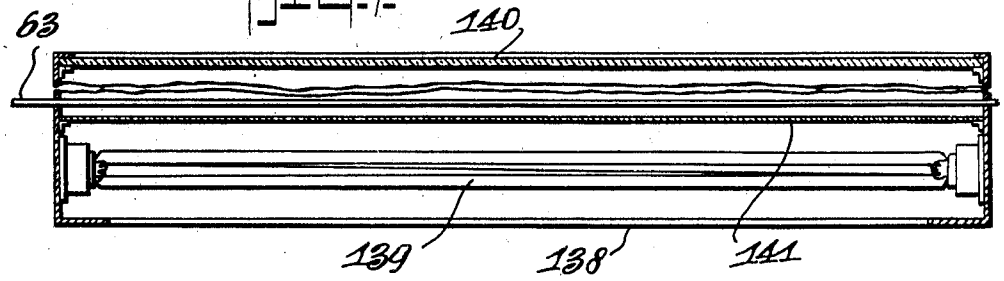
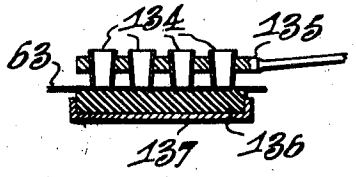


Fig. 8.



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Patented Oct. 26, 1943

2,332,774

UNITED STATES PATENT OFFICE

2,332,774

SIGNALING APPARATUS WITH VISUAL DISPLAY FOR FIRE ALARMS AND THE LIKE

Keith L. Bell, Washington, D. C., assignor of one-half to Curtis E. McGhee, Washington, D. C.

Application April 25, 1940, Serial No. 331,646

10 Claims. (Cl. 177—360)

This invention relates to signaling apparatus generally. More particularly this invention relates to a rapid signaling system particularly adapted for fire alarms, police alarms, transmission of stock quotations and the like.

An object of this invention is to provide a very reliable, accurate and rapid signaling system for fire, police, stock quotation and similar installations where transmission of a complete message at maximum speed and accuracy is essential.

Another object of this invention is to provide a signal system for fire, police, stock quotation and similar installations for transmission of messages at high speed, said system being equipped with a receiver adapted to impress the message received upon a tape by perforating said tape in accordance with the characters comprising said message.

A further object of this invention is to provide a fire alarm signaling system in which each street box is provided with an identifying number which is transmitted direct without being translated into a code, to headquarters or fire stations or both where it is received upon a tape by perforating the outline of said street box numbers into said tape.

Still another object of this invention is to provide a fire alarm signaling system between a headquarters station and all or selected substations, said headquarters station having a message set-up apparatus consisting of a plurality of settable contactor members and a movable wiper contactor for contacting set contactors of said settable contactor members in a certain sequence for transmitting to said all or selected substations, selected characters set upon said settable contactors.

Still another object of this invention is to provide a signaling system for transmitting fire alarms, said signaling system employing a rotatable contactor dial carrying certain identifying characters which are permanently set and certain other characters having means for selectively setting them when desired for transmission over the system.

Other and further objects will be apparent to those skilled in the art to which this invention relates from the following specification and claims.

In accordance with this invention I provide a signaling system that is both fast and accurate in transmitting messages, for example, between a fire alarm street box and a fire station or between several fire stations and headquarters. My system is so arranged that the chances for error are reduced to a minimum and at the same time the messages transmitted are easily read. These are important features especially in the transmission of fire alarms because of the cost of responding to a fire alarm, and if many mistakes are made the efficiency of the fire fighting system is greatly reduced. Rapid transmission of the identity of the station or box originating the message is also very desirable. My system enables the operators to transmit messages and receive such messages in permanent form much more rapidly than systems now in general use in which the characters are transmitted by employing a certain number of dots or similar legends for each character.

A plurality of transmitters can be connected to one or a plurality of receivers by multipling them along the same cable. If desired, a conventional holding relay system, not shown, nor forming a part of this invention, may be employed to avoid possible interference due to two boxes being pulled at the same time.

Further features of this invention will be apparent from the following detailed description of an embodiment of this invention and the accompanying drawings in which, briefly,

Fig. 1 illustrates schematically the connections between the street fire alarm apparatus and the perforating typewriter receiver at headquarters and all or selected fire stations; Fig. 2 illustrates the message set-up apparatus at headquarters and connections between this apparatus and one perforating typewriter receiver at one of a number of fire stations; Fig. 3 is a front view of a street station signal transmitter; Fig. 4 is a sectional view along the line **4—4** of Fig. 3 with parts shown in elevation; Fig. 5 is a view of the perforated tape; Fig. 6 is a top view of the tape illuminating device; Fig. 7 is a sectional view along the line **7—7** of Fig. 6, Fig. 8 is a detailed view of the perforating typewriter hammer, tape and anvil showing the hammer perforating the tape and the hollow conical shape of same which prevents clogging, and Fig. 9 is a detailed fragmentary broken away section taken on the line **9—9** of Fig. 3, showing how the engaging terminal portions of the setting buttons engage and are re-set by the re-setting cam.

Referring to Figs. 1, 3 and 4 in detail reference numeral **10** designates a rotary contactor of insulating material carrying a plurality of contactor elements **11** to **23** inclusive, permanently set in place thereon for actuating the roller **24** of the electrical circuit controller **25** each time

the rotary contactor 10 is released by the manually operated catch or hook 29 and rotated by the electric or spring motor (not shown) geared to the shaft 30. This rotary contactor 10 is positioned in a conventional street fire alarm box and when an alarm is to be transmitted into the fire station the catch or hook 29 is released by the person sending in the alarm to permit the rotary contactor to rotate through one revolution and periodically close the circuit between the contacts 25 as the contactor elements 11 to 23, projecting from the circumferential face of the rotary contactor 10, engage the contactor roller 24 in sequence. These contactor elements 11 to 23 are permanently fixed on the rotary contactor 10 and each time the rotary contactor is rotated the circuit between the contacts 25 is closed by these contactor elements and the perforating typewriter hammers 31, 32, 41 and 42 actuated through the operation of the solenoids 51, 52, 61 and 62, respectively, connected to the contactor elements 14, 12 and 16, 18 and 22 respectively of the rotary contactor 10. Thus rotation of the rotary contactor 10 energizes the solenoids 51, 52, 61 and 62 of the perforating typewriter so that the legend 212A–, which is the designation of the particular street box, is perforated on the tape 63 of said typewriter. Any other three or more numbers may be set up on the rotary contactor 10 as desired and the numbers 212 are taken only by way of example.

The characters of the legend 212A– are properly spaced on the tape and this is accomplished by means of the spacing contactor elements 11, 13, 15, 17, 19, 20, 21 and 23, all of which are connected through suitable wires as shown to one terminal of the spacing solenoid 64 which operates a suitable pawl and ratchet 65 for rotating one of the tape rollers and advancing the tape 63 each time the circuit of contacts 25 and solenoid 64 is closed by one of the "S" contacts 11, 13, 15, 17, 19, 20, 21 and 23.

The contactor 25 consists of two contacts, one of which is supported by the resilient member 26 which also supports the roller 24 and the other of which is supported by the resilient member 28. These members 26 and 28 are separated from each other by the insulator 27 and the member 28 is connected to the battery 66. This contactor 25 and battery 66 are connected to the common wire of the solenoids 51 to 62 inclusive and the spacing solenoid 64. The solenoids 51 to 62 inclusive are employed for actuating the perforating heads 31 to 42 inclusive, respectively. The heads 31 to 40 inclusive are employed for the numerals 1 to 0 inclusive and the heads 41 and 42 are employed for the character A and the hyphen or dash.

It is seen from the drawing that the contact elements 12 and 16 of the rotary contactor 10 which bear the numeral 2 are both connected to the solenoid 52 of the perforating typewriter at the receiver. Thus each time the contact elements 12 and 16 engage the roller 24 the solenoid 52 will be energized and the numeral 2 will be punched into the tape 63. The spacing contacts 11 and 13 preceding and following the contact 12 insure the proper feeding of the tape 63 through the operation of the spacing solenoid 64 and ratchet mechanism 65 so that the numerals impressed upon the tape 63 will be properly spaced.

After the identity of the street box is transmitted from the rotary contactor 10 to the perforating typewriter receiver at the fire station or stations or at fire alarm headquarters, in this case the identity being the numerals 212, the letter A is transmitted through the operation of the contacting element 18 and the solenoid 61, for the purpose of showing the number of the multiple fire alarm designated by the number following the letter A.

If the alarm transmitted is the first alarm then the character A is followed by three spaces, or by the numeral one, on the tape 63, corresponding to the contact elements 19, 20 and 21, and this is followed by a dash which is impressed upon the tape 63 by the perforating hammer 42 energized through the operation of contacting element 22 and the solenoid 62. The dash is followed by another space corresponding to the contacting element 23. Up to a tenth multiple alarm or more if desired may be transmitted from the street box employing the rotary contactor 10.

When the second alarm is transmitted the operator who sends in the second alarm before releasing the catch or hook 29 must first press the button 72 on the front of the rotary contactor 10 to force a contacting element 82 to project from the circumference of the rotary contactor a sufficient distance to engage the roller 24 and close the circuit between the contacts 25 as the rotary contactor 10 rotates. Thereupon after the character A is transmitted to the perforating typewriter receiver tape 63, a spacing impulse is transmitted corresponding to the spacing contact 19 and this is followed by the numeral 2 transmitted through the operation of the contact element 82 pressed from the circumference of the rotary contactor. This is then followed by two spaces corresponding to contacts 20 and 21 and the dash corresponding to the contact 22.

The first to ninth alarms inclusive may be transmitted by pressing the buttons 71 to 79 respectively in succession and each time releasing the catch or hook 29. If a tenth alarm is to be transmitted the buttons 71 and 80 must be pressed so as to cause the contacting elements 81 and 90 to project from the circumference of the rotary contactor.

Some of the details of construction of the rotary contactor 10 are more clearly illustrated in Figs. 3 and 4 of the drawings. A rotatable supporting shaft 30 carries the entire assembly comprising insulating disc rotary contactor 10 and its tubular portion 10—*a*, and its buttons and other members. In Fig. 4 is shown a sectional view illustrating one of the buttons 75 and contacting element 85. It is seen that when the button 75 is pressed the contacting pin element 85 which is normally urged inwardly by spring 95, is unseated from the engaging recesses in the pintle of setting button member 75 and is caused to project from the circumference of the insulating rotary member 10. The contacting member 85 is forced back beneath the circumference of insulating member 10, by helical spring 95, when terminal portion 75*a* of setting button member 75 contacts re-setting cam member 100. In the transmission of multiple alarms after the first alarm, the multiple alarm contacting element or elements employed are returned to their normal positions automatically. For example, if the fifth alarm is to be transmitted the button 75 is pressed and the contacting element 85 is projected from the circumference of the rotary contactor. At the same time the roller 75*a* carried by the inside end of the button 75 is caused to project sufficiently so that it engages the clearing member

100 after the contacting element 85 has engaged the roller 24 during the counter clockwise rotation of the member 10. The clearing element 100 presses the button 75 back into its normal position.

Each of the contacting elements of the rotary contactor 10 is connected to one of the insulated slip rings 101 mounted on the tubular portion 10a of the rotary contactor by wires passing through the bore of tubular portion 10—a. There are sixteen of these slip rings, one for each of the sixteen numeral and letter contacting elements, the spacing contacting elements being all connected to one slip ring. Contact is established with the slip rings by means of a brush system 102 and from these brushes connections are made to the cable leading to the solenoids of the perforating typewriter receiver.

A signal set up apparatus for use at the fire alarm headquarters is illustrated in Fig. 2 together with a perforating typewriter receiver. The set up apparatus consists of four manually rotatable contactors 110, 111, 112 and 113 for setting up the box numbers of four digits or more if desired. Spacing contactors 114, 115, 116, 117 and 118 precede and follow these contactors. Multiple alarm manually rotatable set up contactors 119 and 120 follow the box number set up contactors. Three contacts 118, 121 and 122 are provided between the contactors 113 and 119 and one of these contacts 121 carries the legend A. The contactors 119 and 120 are separated by the spacing contact 123 and a spacing contact 124 follows the contactor 120. The contact 125 carries a dash and is followed by a spacing contact 126. The rotatable contactors 110, 111, 112, 113, 119 and 120 are arranged so that the brushes 127 and 128 of the contacting tape 129 carried by the rollers 130 and 131, contact the uppermost contacting element set up on each of the rotatable number set up devices 110, 111, 112, 113, 119 and 120.

Thus the numbers set up on these rotatable set-up devices are transmitted through the conducting tape 129, brush 127 or 128, connection 132, battery 133 to the selected solenoids 51 to 60 inclusive. The solenoids energized of course depend upon the number set up on the rotatable set up dials. Inasmuch as each of the set-up dials is preceded by a spacing contact connected through a suitable cable to the spacing solenoid 64 of the receiver, the numbers transmitted from the set up system to the perforating typewriter receiver will be suitably spaced upon the receiver tape 63. Following the box number transmitted from the set-up dials 110, 111, 112 and 113 is the letter A, and this is followed by the number of the alarm transmitted from the multiple alarm set-up dials 119 and 120. This is followed by the dash corresponding to the contact 125.

Each of the set-up dials 110, 111, 112 and 113 is provided with eleven contacting elements. These contacting elements are designated by the numerals 1 to 9 inclusive and by a zero and a dash. Similarly designated contacting elements of these set-up dials are connected together through a series of connections as illustrated, and these connections are in turn connected to the corresponding solenoids of the perforating typewriter receiver. For example the contacting element 2 of each of the dials 110, 111, 112 and 113 is connected to a common wire which in turn is connected to the solenoid 52 used for actuating the perforating hammer 32 which bears the numeral 2. In the same manner the other contacting elements of the set-up dials are connected to actuating solenoids of the perforating typewriter. The four dials 110, 111, 112 and 113 are used to transmit fire alarm messages, for example, to give the location of the origin of the fire alarm, to various fire stations from the headquarters station.

Two additional dials 119 and 120 are employed for the purpose of transmitting an indication of the number of the multiple fire alarm transmitted. For instance, if the second alarm is being transmitted the dial 119 is rotated so that the contacting element corresponding to the numeral 2 is in the uppermost position. However if the tenth alarm is being transmitted the numeral 1 is set up at the uppermost position of dial 119 and the zero is set up at the uppermost position on the dial 120. In case the operator should make an error in setting any of the various dials, a series of dashes may be transmitted by a manually operated key or by setting all of the contactor dials so that the contacting element corresponding to the dash is uppermost, and thereafter the dials may be adjusted to transmit the desired message correctly.

A plurality of spacer contacts 114, 115, 116, 117 and 118, are associated with the dials 110, 111, 112, and 113 and these are connected to a common wire which is connected to the spacer solenoid 64 to space the tape 63 before and after the transmission of each numeral. These spacer contacts are also arranged so that they may be engaged by the brushes 127 and 128 as these brushes are moved along by the conducting conveying tape 129 mounted on the rollers 130 and 131 which are driven by a spring or electric motor. Additional spacing contacts 122, 123, and 124 are associated with the multiple alarm dials 119 and 120. These spacing contacts are also connected to the common wire which is connected to the spacing solenoid 64.

The multiple alarm dials 119 and 120 have the contacting elements thereof connected to correspondingly designated contacting elements of the four box number dials 110, 111, 112 and 113. Thus the contacting element carrying the numeral 2 of the dial 118 is connected to the contacting elements of dials 110, 111, 112 and 113 bearing this same numeral. In this way the desired numerals of dials 119 and 120 are also printed on the perforating typewriter receiver. The numerals transmitted from the dials 119 and 120 follow the character A transmitted by the contact 121 and therefore designate the number of the alarm. This is followed by the dash transmitted by the contact 125 to indicate the end of the alarm. An additional spacing impulse is transmitted through the contact 126 after the dash 125.

One terminal of the current supply source 133 is connected to the conducting tape 129 by means of a brush or suitable connection 132. The other terminal of this current supply source is connected to the common connection of the solenoids 51—62 inclusive and to the spacing solenoid 64.

A view of a fragment of the tape 63 bearing the legend 212A2 is illustrated in Fig. 5. This shows the manner in which the perforating typewriter hammers perforate the numerals and other characters into this tape. The message carried by this tape is the identification of the street box set up on the rotary contactor 10 illustrated in Figs. 1 and 3, and also indicates that the second alarm is being sent inasmuch as the numeral 2 follows the letter A. The numerals and charac-

ters are punched into the tape 63 by the perforating typewriter hammers 31 to 42 inclusive, each of which is constructed as illustrated in Fig. 8 by mounting a plurality of punches 134, in the outline of the numeral or character desired, upon a relatively heavy hammer 135. The hammer 135 is adapted to be actuated by solenoids 51 to 62 inclusive depending upon the character selected to be cut by the hammer into the tape.

The punches 134 are of tubular-frusto-conical shape with the smaller diameters ground sharp to form sharp tape perforating cutting edges. The cutting edges of these punches are made of smaller diameter than the idle ends so that the tape punchings may be easily removed from the insides of the punches automatically. The tape 63 is backed by a slightly resilient or compressible anvil 136 which is supported by a channel member 137. If an inked ribbon is used for the purpose of printing the characters selected on the tape then the hammers are not made in the form of punches but carry the characters in dotted or blunt outline so as not to cut the inked ribbon.

After the tape is perforated with the desired message it is passed through an illuminated reading device 138 illustrated in Figs. 6 and 7. This device consists of a housing of sheet metal with an elongated electric light bulb 139 mounted inside and having the surface thereof preferably painted with a red dye. This lamp illuminates the back of the tape 63 and causes the red light to shine through the perforation of this tape onto the ground glass 140 so that the outlines of said perforations are projected upon the ground glass as illustrated in Fig. 6.

Where desired a red glass 141 may be positioned as shown between the lamp 139 and the tape 63, and the back of the housing 138 left open so that light from the outside of the housing may shine through this opening and illuminate the tape 63 from the bottom thereof in case of failure of the lamp 139. Where desired the ground glass 140 may be replaced by an elongated magnifying glass for magnifying the message on the tape 63. When ground glass is employed it is preferably positioned about six or eight inches from the tape.

What I claim is as follows:

1. In a fire alarm or like signaling apparatus, the combination of contactor means at a signaling station having a plurality of contacting elements corresponding to identifying characters for the signaling station, means for selectively setting up predetermined ones of said contacting elements into contacting positions on said contactor means, switching means for producing an electrical impulse each time one of said set-up contacting elements engages said switching means, said switching means being movable relatively to the contacting elements of said contactor means, a source of current supply, and individual transmitting connections connected to each of said contacting elements.

2. In a fire alarm or like signaling apparatus, the combination of a rotary contactor at a signaling station having a plurality of contacting elements corresponding to identifying characters for the signaling station, individual wires connected to said contacting elements, a contactor for engaging said contacting elements, a common wire connected to said last mentioned contactor, a receiving station consisting of a tape perforating typewriter having a tape, perforating hammers carrying a plurality of different characters adapted to be selectively impressed upon said tape by perforating said tape therewith, solenoids for actuating said perforating hammers, a common connection for connecting one terminal of each of said solenoids together and to said common wire, connections for connecting the other terminal of each of said solenoids to selected ones of said contacting elements of said rotary contactor bearing the corresponding identifying characters, auxiliary selectively settable contacting elements positioned on said rotary contactor for transmitting the number of the fire alarm transmitted from said signaling station, and means for transmitting a predetermined character from the signaling station following the identifying characters and preceding the number of the fire alarm.

3. In a fire alarm or like signaling apparatus, a rotary contactor having a plurality of fixed contacting elements for transmitting signal impulses to constitute the alarm and for identifying the signaling station from which the alarm is transmitted, a plurality of settable contacting elements for said rotary contactor for transmitting the number of the alarm transmitted from said signaling station, a plurality of push buttons for setting selected ones of said settable contacting elements, and means for releasing automatically said set contacting elements after transmission of signal impulses thereby.

4. In a fire alarm or like signaling apparatus, a rotary contactor of insulating material having a plurality of fixed contacting elements for transmitting signal impulses to constitute the alarm and for identifying the signaling station from which the alarm is transmitted, a plurality of settable contacting elements for said rotary contactor for transmitting the number of the alarm transmitted from said signaling station, a plurality of slip rings carried by said rotary contactor, connections between said contacting elements and said slip rings, a plurality of push buttons for setting selected ones of said settable contacting elements, and means for releasing automatically said set contacting elements after transmission of signal impulses thereby.

5. In a fire alarm or like signaling apparatus, a rotary contactor of insulating material having a plurality of fixed contacting elements projecting therefrom, a stationary contact for engaging said contacting elements of said contactor for transmitting signal impulses to constitute the alarm and for identifying the signaling station from which the alarm is transmitted, a plurality of settable contacting elements for said rotary contactor for transmitting the number of the alarm transmitted from said signaling station, a plurality of push buttons carried by said rotary contactor for projecting selected ones of said settable contacting elements from said rotary contactor to engage said stationary contact, and means for releasing automatically said set contacting elements after transmission of signal impulses thereby.

6. In a signaling apparatus, an insulating carrier member, a fixed contact element, mounting means for movably mounting said carrier member for translation of the periphery thereof past said fixed contact element, motive means for controllably translating said periphery past said fixed contact element, permanent carrier conducting contact elements fixedly mounted on the periphery of said carrier member for engagement with said fixed contact element as said carrier member is translated therealong, and individual separate transmitting connections con-

nected to said fixed contact element and to each of said carrier contact elements respectively for successively separately transmitting electrical impulses from said carrier contact elements as said carrier member is translated.

7. In a signaling apparatus, an insulating carrier member, a fixed contact element, mounting means for movably mounting said carrier member for translation of the periphery thereof past said fixed contact element, motive means for controllably translating said periphery past said fixed contact element, permanent carrier conducting contact elements fixedly mounted on the periphery of said carrier member for engagement with said fixed contact element as said carrier member is translated therealong, individual adjustable carrier contact elements adjustably mounted on said carrier member for controllable projection from a normal rest position within said carrier member into an actuating position in the path of engagement with said fixed contact element as said carrier member is translated, restraining means for normally holding said adjustable carrier contact elements within said carrier member, and a plurality of individual separate selectively actuatable setting elements mounted on said carrier member and respectively engageable when actuated with each of said adjustable carrier contact elements respectively and adapted to selectively project said carrier contact elements respectively into actuating position against the action of said restraining means, and individual separate transmitting connections connected to said fixed contact element and to each of said carrier contact elements respectively for successively separately transmitting electrical impulses from said carrier contact elements as said carrier member is translated.

8. In a signaling apparatus, an insulating carrier member, a fixed contact element, mounting means for movably mounting said carrier member for translation of the periphery thereof past said fixed contact element, motive means for controllably translating said periphery past said fixed contact element, permanent carrier conducting contact elements fixedly mounted on the periphery of said carrier member for engagement with said fixed contact element as said carrier member is translated therealong, individual adjustable carrier contact elements adjustably mounted on said carrier member for controllable projection from a normal rest position within said carrier member into an actuating position in the path of engagement with said fixed contact element as said carrier member is translated, restraining means for normally holding said adjustable carrier contact elements within said carrier member, and a plurality of individual separate selectively actuatable setting elements mounted on said carrier member and respectively engageable when actuated with each of said adjustable carrier contact elements respectively and adapted to selectively project said carrier contact elements respectively into actuating position against the action of said restraining means, each of said setting elements respectively having a re-set portion adapted when said setting element is actuated to project outwardly from said carrier member and out of the path of asid fixed contact element, and a re-setting cam member fixedly mounted in the path of said re-set portions as said carrier member is translated and adapted to engage said re-set portions and to retract said setting element within said carrier member and into unactuated position, and individual separate transmitting connections connected to said fixed contact element and to each of said carrier contact elements respectively for successively separately transmitting electrical impulses from said carrier contact elements as said carrier member is translated.

9. In a signaling apparatus, an insulating carrier member, a fixed contact element, mounting means for movably mounting said carrier member for translation of the periphery thereof past said fixed contact element, motive means for controllably translating said periphery past said fixed contact element, permanent carrier conducting contact elements fixedly mounted on the periphery of said carrier member for engagement with said fixed contact element as said carrier member is translated therealong, individual manually adjustable carrier contact elements adjustably mounted on said carrier member for controllable projection from a normal rest position within said carrier member into an actuating position in the path of engagement with said fixed contact element as said carrier member is translated, each of said carrier contact elements having an inner terminal actuating portion, helical springs respectively mounted in said carrier member for normally urging each of said carrier contact elements respectively inwardly within said carrier member, and individual selectively actuatable setting elements mounted on said carrier member and comprising a seating recess adapted when said setting element is unactuated to receive said terminal portions of said carrier contact elements respectively and retain said carrier contact elements in unactuated position, said setting elements having terminal knobs adapted for manual displacement, and said setting elements being adapted when actuated to displace said carrier contact element and its said terminal portion from said seating recess against the urging of said spring and to project the same into actuated position without said carrier member, and individual separate transmitting connections connected to said fixed contact element and to each of said carrier contact elements respectively for successively separately transmitting electrical impulses from said carrier contact elements as said carrier member is translated.

10. In a signaling apparatus, an insulating carrier member, a fixed contact element, mounting means for movably mounting said carrier member for translation of the periphery thereof past said fixed contact element, motive means for controllably translating said periphery past said fixed contact element, permanent carrier conducting contact elements fixedly mounted on the periphery of said carrier member for engagement with said fixed contact element as said carrier member is translated therealong, individual manually adjustable carrier contact elements adjustably mounted on said carrier member for controllable projection from a normal rest position within said carrier member into an actuating position in the path of engagement with said fixed contact element as said carrier member is translated, each of said carrier contact elements having an inner terminal actuating portion, helical springs respectively mounted in said carrier member for normally urging each of said carrier contact elements respectively inwardly within said carrier member, and individual selectively actuatable setting elements mounted on said carrier member and comprising a seating recess

adapted when said setting element is unactuated to receive said terminal portions of said carrier contact elements respectively and retain said carrier contact elements in unactuated position, said setting elements having terminal knobs adapted for manual displacement, and said setting elements being adapted when actuated to displace said carrier contact element and its said terminal portion from said seating recess against the urging of said spring and to project the same into actuated position without said carrier member, said setting elements further respectively each having a re-set portion adapted when said setting elements are actuated to project outwardly from said carrier member and out of the path of said fixed contact elements, and a re-setting cam member fixedly mounted in the path of said re-set portions as said carrier member is translated and adapted to engage said re-set portions and to retract said setting element inwardly within said carrier member and into unactuated position, and individual separate transmitting connections connected to said fixed contact element and to each of said carrier contact elements respectively for successively separately transmitting electrical impulses from said carrier contact elements as said carrier member is translated.

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