March 22, 1966 E. TELLERMAN 3,242,388

CODED ACTUATING DEVICE

Filed Nov. 2, 1961 3 Sheets-Sheet 1

Fig. 1.

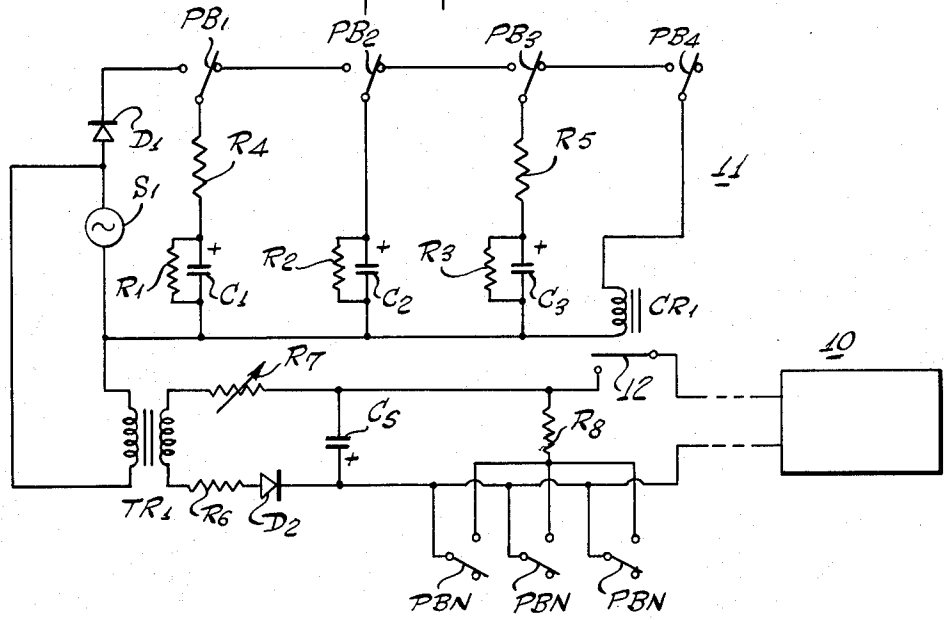
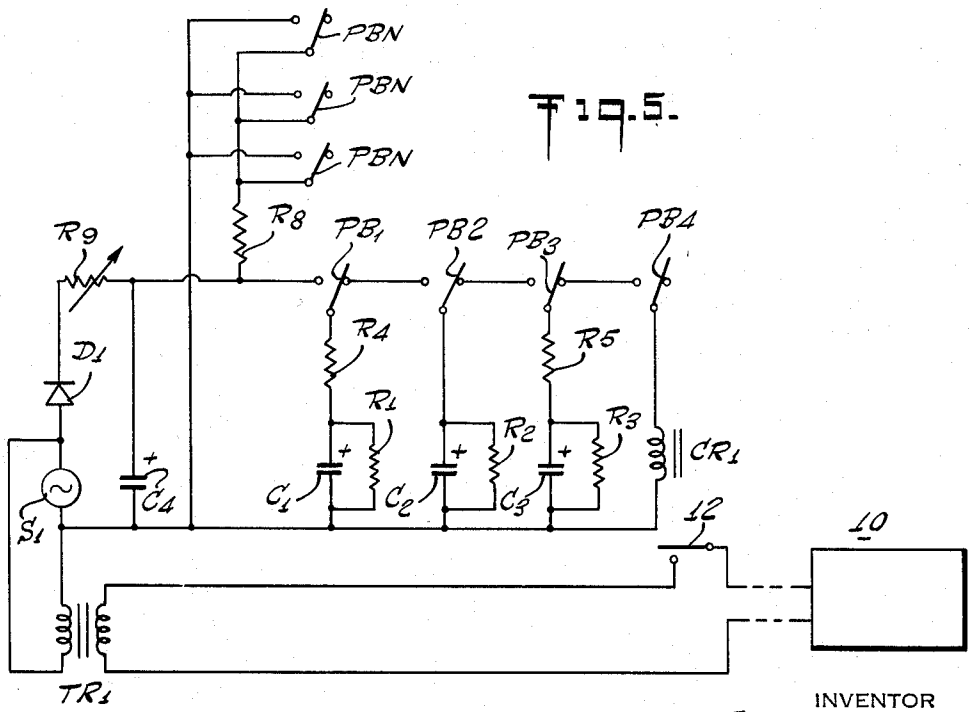


Fig. 5.



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CODED ACTUATING DEVICE

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FIG. 4.

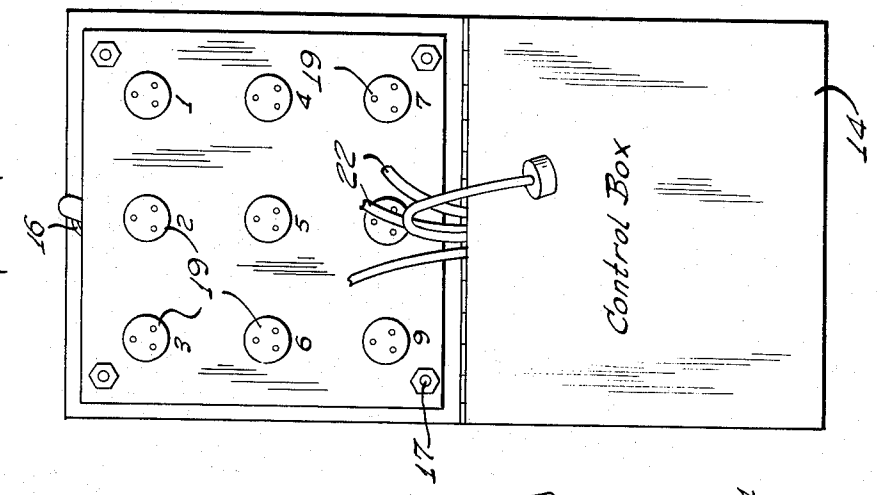


FIG. 3.

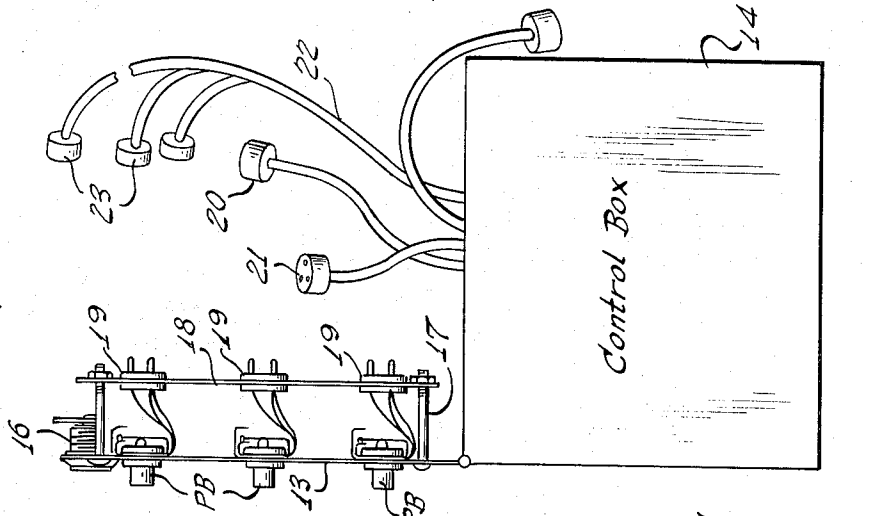
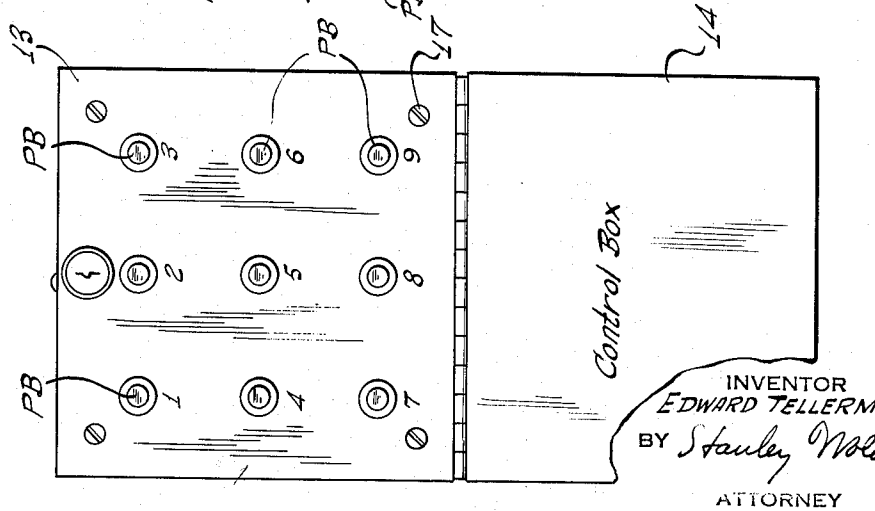


FIG. 2.



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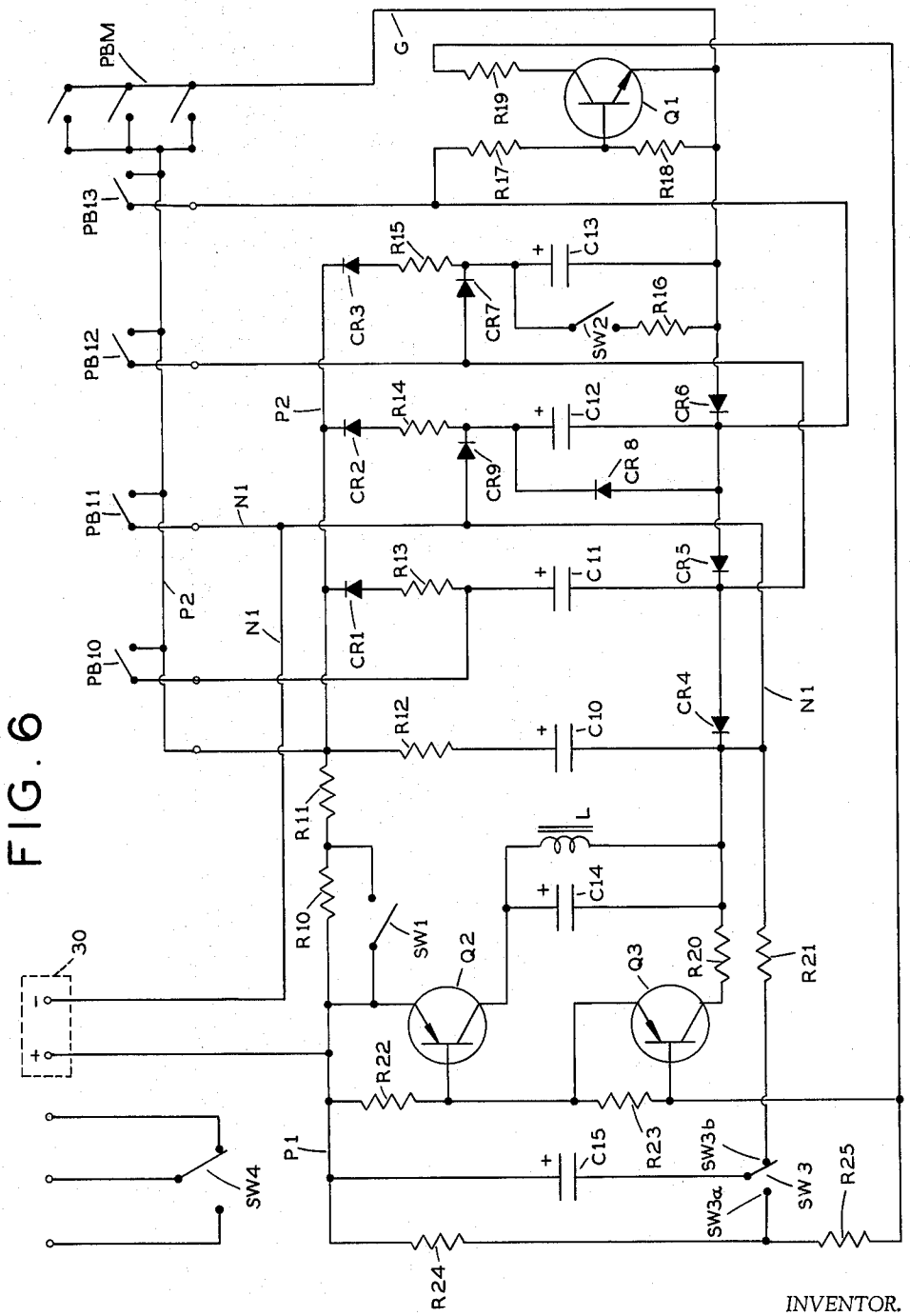


FIG. 6

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United States Patent Office 3,242,388 Patented Mar. 22, 1966

3,242,388

CODED ACTUATING DEVICE

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Filed Nov. 2, 1961, Ser. No. 150,856
21 Claims. (Cl. 317—134)

The present invention relates generally to improvements in coded actuating devices which in the preferred form relates more particularly to an improved electrical combination lock mechanism. The present patent application is a continuation-in-part of the copending patent application of Edward Tellerman, Serial No. 82,094 filed January 11, 1961 and now abandoned.

Coded actuating devices are best exemplified by combination locks. These are conventionally of a mechanical nature, requiring the rotation of a dial to successive predetermined positions in a predetermined sequence or the proper arrangement of a plurality of tumblers or the like to permit the actuation of the latch or lock mechanism. These mechanically coded systems possess numerous drawbacks and disadvantages. They are highly complex, particularly where the number of available permutations and combinations are high. Furthermore, many of these combination mechanisms afford detectable signals which permit the surreptitious determination of the proper combination. Means for masking these signals further complicate the mechanism. Various types of electrical coding mechanisms have been suggested but these likewise leave much to be desired.

It is thus a principal object of the present invention to provide an improved coded actuating device.

Another object of the present invention is to provide an improved combination lock coding system.

Still another object of the present invention is to provide an improved electrical coding system for the actuation of locks and the like.

A further object of the present invention is to provide an improved simple electrical coding mechanism wherein a large number of combinations are available and in which the actuating combination may be easily and readily varied.

Another object of the present invention is to provide an improved electrical coding mechanism which is disabled for a predetermined interval upon improper operation thereof.

Still a further object of the present invention is to provide an improved code actuated mechanism of the above nature characterized by its ruggedness, simplicity, versatility, and adaptability.

The above and other objects of the present invention will become apparent from a reading of the following description taken in conjunction with the accompanying drawing wherein:

FIGURE 1 is a circuit diagram of an electrical network embodying the present invention;

FIGURE 2 is a front elevational view of a switch carrying panel board and a control box housing the electrical network;

FIGURE 3 is a side elevational view thereof;

FIGURE 4 is a rear elevational view thereof;

FIGURE 5 is a circuit diagram of another form of electrical network embodying the present invention; and

FIGURE 6 is a circuit diagram of still another form of electrical network embodying the present invention.

In a sense the present invention contemplates the provision of an improved coded actuating mechanism comprising a plurality of capacitors including a leading capacitor and a trailing capacitor, and electrically responsive actuating device, first selectively operable means for applying a charge to said trailing capacitor, second selectively independently operable means for charging successive of said capacitors from a next preceding capacitor and third selectively operable means for coupling said leading capacitor to said actuating device.

An important feature of the present invention resides in the provision of a coded actuating network comprising a pluarlity of first switches, first means responsive to the actuating of said first switches in a predetermined sequence and second means responsive to the actuation of one of said first switches out of said predetermined sequence disabling said first means.

According to one form of the present invention there are provided a plurality of charge transferring capacitors, each of said capacitors being shunted by a bleeder resistor to effect the slow discharge of the capacitor and hence limit the time within which the proper combination must be achieved, as will be hereinafter apparent. A first terminal of each of the transfer capacitors is connected to the arm of a respective momentarily actuatable double throw switch which includes normally open first contacts and normally closed second contacts. These switches are indistinguishable and are mounted on a panel board in an arrangement unrelated to that of the capacitors. A source of D.C. current has one pole connected to the normally open contact of the trailing capacitor switch and its other pole connected to the second terminal of each of the capacitors. The normally closed contact of each of the capacitor switches, except the leading capacitor switch, is connected to the normally open contact of the preceding switch and the normally closed contact of the leading capacitor switch is connected through a normally open switch and a relay solenoid to the leading capacitor second terminal. There is also provided a storage capacitor which is connected by way of a high resistance rheostat to a source of direct current, the available RC time constant of the storage capacitor and rheostat being high so as to require a long capacitor charging time. The storage capacitor is shunted by a plurality of normally open momentarily actuatable switches which are mounted on the panel board with the charge transfer switches and are indistinguishable therefrom. The storage capacitor is also connected by way of normally open contacts actuated by the above relay solenoid to an electrically actuatable device which may be in the form of a solenoid actuated lock unlatching mechanism of conventional type. For example the lock bolt may be locked in closed position by a latch element engaging the bolt and spring urged toward an unlatch position. A dog normally retains the latch element in its lock position and may be moved to release position by a solenoid which is energized by the charged storage capacitor upon closing of the relay contacts. The unlatching mechanism may be actuated only by actuating the transfer switches in proper sequence within a predetermined time interval and without actuating any of the other switches. The mechanism is simple, fool proof and highly versatile. The number of available combinations may be varied by the varying number of transfer capacitors and disabling switches and means are provided for simply changing the mechanism combination.

In accordance with another form of the present invention which may be employed to great advantage there is provided a trailing or storage capacitor and a plurality of successive leading or charge transfer capacitors. The charge capacitor is connected to a source of charging voltage by way of a relatively high resistor so that a relatively long time is required to fully charge the trailing capacitor. Each of the charge transfer capacitors has its first terminal connected to the first terminal of the storage capacitor through a respective normally open push button switch and also through a first diode oriented to provide

a high resistance to the flow of current from the storage to the transfer capacitor. Each of the transfer capacitor first terminals is connected to the second terminal of the corresponding trailing capacitor once removed. The second terminal of each capacitor is connected by way of a diode, oriented opposite to the first diode, to the second terminal of the next preceding capacitor. Thus upon the closing of any switch charge transfer is effected from a trailing to a successive leading capacitor and the capacitor trailing the said trailing capacitor are discharged. As a result, the closing of any switch out of sequence disables the circuit for a predetermined interval. Here again are provided a plurality of penalty switches the closing of any of which discharges all of the capacitors.

Referring now to the drawings and more particularly to FIGURES 1 to 4 thereof which illustrate a preferred embodiment of the present invention, the reference numeral **10** generally designates an electrically actuated latch mechanism which may be of the type earlier described and which is coupled to the improved electrically coded circuit network **11**. The network **11** includes a plurality of charge transfer capacitors **C1**, **C2** and **C3** which may be separate capacitors or may be defined by the sections of multisection capacitor having a common ground terminal. While only three transfer capacitors are illustrated this number can be varied as desired. A first terminal of each of the capacitors **C1**, **C2** and **C3** is connected to one pole of a source of alternating current **S1** the other pole of which is connected by way of a solid state diode **D1** to the normally open contact of a momentarily actuated push button double throw switch **PB1**. The capacitors **C1**, **C2** and **C3** are each shunted by respective bleeder resistors **R1**, **R2** and **R3** whereby to slowly discharge the capacitors for the purpose hereinafter set forth.

In addition to the switch **PB1** there are provided double throw momentarily actuated push button switches **PB2** and **PB3**. The arm of the switch **PB1** is connected by way of a current limiting resistor **R4** to the second terminal of the capacitor **C1** and the arm of the switch **PB3** is connected by way of a current limiting resistor **R5** to the second terminal of the capacitor **C3**. The arm of the switch **PB2** is connected directly to the second terminal of the capacitor **C2**. The normally closed contact of switch **PB1** is connected to the normally open contact of switch **PB2**, the normally closed contact of which in turn, is connected to the normally open contact of the switch **PB3**. The normally closed contact of switch **PB3** is connected by way of the normally open contact of a momentarily actuated push button double throw switch **PB4** and a series connected relay solenoid **CR1** to the first terminal of the capacitor **C3**. A pair of normally open relay contacts **12** are closed by an armature actuated by the relay solenoid **CR1**.

A step down transformer **TR1** has its primary winding connected to the alternating current source **S1** and one terminal of its secondary winding is connected through a high resistance rheostat **R7** to a first terminal of a high capacitance storage condenser **CS** and the other terminal thereof is connected by way of a resistor **R6** and a solid state diode rectifier to the second terminal of the storage condenser **CS**. The normally open contacts of a plurality of momentarily actuated push button double throw switches **PBN** are connected in parallel and through a current limiting resistor **R8** to one terminal of the condenser **CS** and the arms of the switches **PBN** are connected to the other terminal thereof. The actuation of any of the switches **PBN** almost instantly discharges the storage condenser **CS** which is slowly recharged by way of the rheostat **R7**, resistor **R6** and diode **D2**, the charging rate being dependent upon the time constant of the RC network including the condenser **CS** and the rheostat and resistor **R7** and **R5**. This may be adjusted by the rheostat **R7**. The control terminals of the electrically actuated device **10** are connected across the condenser **CS** by way of the relay contacts **12**.

The various push button switches **PB** which may, if desired, be replaced by other type double throw switches, are mounted on a rectangular panel board **13** which is hinged to the upper leading edge of a control box **14** which houses the coded circuit network **11**. The assembly is mounted in any suitable position so that only the front face of the switch carrying panel **13** is available and the panel **13** is releasably locked in its closed position by a key operated lock **16**. Upon opening of the lock **16** the panel may be swung open to provide access to the rear face thereof to permit the varying of the coded combination.

Mounted on and spaced from the rear face of the panel **13** by means of bracket screws **17** is a mounting plate **18** which carries a plurality of three pronged plugs **19** located in alignment with corresponding switches **PB**. The terminals or prongs of each of the plugs **19** is connected to the corresponding terminals of a respective switch **PB**. The connection points of the switches **PB1**, **PB2**, **PB3** and **PB4** as seen in FIGURE 1 of the drawing are connected by way of respective three conductor cables **20** to sockets **21** which mate the plugs **19**. A branched two conductor cable harness **22** carries a plurality of sockets **23** which likewise mate the plugs **19** and are parallel connected across the condenser **CS** by way of resistor **R8** as illustrated. It should be noted that the plugs and sockets are so polarized and connected that when they are brought into engagement the circuit network illustrated in FIGURE 1 is completed regardless of which plugs engage which sockets. However, the location of the individual switches **PB1**, **PB2**, **PB3** and **PB4** on the panel must be known to actuate the proper combination sequence and their location on the panel may be changed merely by interchanging the various plug and socket mating engagements. In the specific embodiment illustrated the number of sockets **23** is preferably 5, so that all the panel carried switches **PB** are employed. The number of switches as well as the number of transfer capacitors may be varied thereby varying the number of available combinations. It is important to note that the various plugs and sockets are so connected and polarized that the illustrated circuit is achieved independent of the plug and socket inter-connection arrangement. Moreover, the switches on the panel are mutually indistinguishable in so far as their connections in the circuit are concerned.

Considering now the operation of the coded system described above when the proper combination is effected, upon actuation of the switch **PB1** capacitor **C1** is rapidly fully charged through the diode **D1** and resistor **R4** and the closed switch contact. Upon release of switch **PB1** switch **PB2** is actuated transferring through the closed **PB1** contact and the momentarily closed **PB2** contact half the charge from capacitor **C1** to capacitor **C2**, part of the initial charge on **C1** having been dissipated through bleeder resistor **R1**. Switch **PB2** is then released and switch **PB3** actuated to transfer half the charge of capacitor **C2** to capacitor **C3** in the manner above described, the charge on capacitor **C2** having somewhat decayed through bleeder resistor **R2**. Switch **PB3** is then released and switch **PB4** actuated to discharge the capacitor **C3**, part of whose charge has been dissipated through bleeder resistor **R3**, through the relay solenoid **CR1**, energizing the solenoid and actuating the relay armature to momentarily close the relay contacts **12** and discharge the condenser **CS** through the electrically actuated device **10** to actuate the same.

The sequential actuation and release of the switches **PB1**, **PB2**, **PB3** and **PB4** must be effected within a predetermined period of time so that the charge carried to the solenoid **CR1** is sufficient to actuate the associated relay armature. The longer the time taken to effect the proper sequential operation, the less the charge trans-

ferred to the relay solenoid by reason of the continuous decay of the charge through the respective resistors R1, R2 and R3. Thus, the maximum time within which the operational sequence must be effected depends on the sensitivity of the relay, the voltage of the current source, the capacitances of the capacitors and the time constants of the various capacitors C1, C2 and C3 and the bleeder resistors R1, R2 and R3. While it is most convenient to adjust the resistors R1, R2 and R3 to obtain the desired upper limit of the operation sequence interval, any of the other parameters may be adjusted.

Even if the proper sequence of switch actuation is effected within the predetermined time limit, if any of the switches PBN are actuated shortly before or during the actuation sequence, the condenser CS is discharged and the output thereof to the device **10** is insufficient to actuate the latter. The time constant of the changing circuit of the condenser CS should be many times that of the maximum time interval for effecting the combination sequence, so that if any switch PBN is actuated the energizing circuit is disabled and the combination operation is ineffective. Moreover, a predetermined time must elapse between an actuation of any switch PBN and the effective performance of the combination sequence.

The following values are given by way of example of the components of the circuit illustrated in FIGURE 1 of the drawing.

C1, C2, C3	40 microfarads.
CS	1000 microfarads.
D1, D2	Silicon diode, 250 ma., inverse voltage —200 volts.
R1, R2, R3	62K ohms, ½ watt.
R4, R5, R6, R8	510 ohms, ½ watt.
R7	1 megohm rheostat.
TR1	60 cycles, 5 watts, 117 inputs, 10 volts output transformer.
PB	Single pole, double throw momentarily actuated pushbutton switches, contact current 250 ma.
CR1	60 mw., 2500 ohms relay coil, with 2 amp contacts.

The voltage source is the conventional 60 cycle 110 volt power line. It should be noted however, that batteries may replace the A.C. voltage source and the associated diodes and transformer so that the mechanism is independent of power failures. It should also be noted that the capacitors C1, C2 and C3 and the associated bleeder resistors need not be of the same value in which case the charge transfer is correspondingly modified. Further, alarm means may be provided in any suitable manner which is triggered by the actuation of any of the switches PBN.

In FIGURE 5 of the drawing there is illustrated a modified form of circuit network embodying the present invention. It differs from the circuit previously described in the disabling arrangement. Specifically the switches PB1, PB2, PB3 and PB4, resistors R1, R2, R3, R4 and R5, capacitors C1, C2 and C3 and relay solenoid CR1 and contacts **12** are connected and function as previously described. However the output winding of the transformer TR1 is directly connected through the relay contacts **12** to the electrically actuated device **10**. A storage condenser C4 is connected by way of a rheostat R9 and the diode D1 to the alternating current source S1, the time constant of the charging circuit of condenser C4 being relatively high as in the earlier embodiment. The switches PBN are connected across the storage condenser C4 by way of a current limiting resistor R8. The mechanical arrangement and construction of the device employing the circuit illustrated in FIGURE 5 is similar to that of the earlier described embodiment.

The operation of the device last described is similar to that first described except that the actuation of any of the switches PBN prior to the initiation of the combination sequence disables the device by reason of the resulting discharge of the storage condenser C4 and the slow charging rate thereof. Hence upon the prompt following actuating of switch PB1 only a small charge is impressed upon the capacitor C1 and the resulting charge transferred to capacitor C3 is insufficient to actuate the relay armature associated with the solenoid CR1. In all other respects the operation and functioning of the circuit network of FIGURE 5 are similar to that of FIGURE 1.

Referring now to FIGURE 6 of the drawing which illustrates another network in accordance with the present invention which offers manby advantages over those earlier described, there are provided a trailing or storage electrolytic capacitor C10, a plurality of successive change transfer electrolytic capacitors C11, C12 and C13, a plurality of normally open coded pushbutton switches PB10, PB11, PB12 and PB13 and a plurality of penalty push button switches PBM, the various switches being, as in the earlier embodiment undistinguishable. The positive terminal of a suitable power supply **30** is connected to a positive line P1 and by way of a high value charging resistor R10 and current limiting resistor R11 to a line P2 and the negative terminal of the power supply **30** is connected to a negative line N1. The charging resistor R10 is shunted by normally open relay contacts or switch SW1.

The positive terminal of the capacitor C10 is connected by way of a current limiting resistor R12 to the positive line P2. It should be noted that the resistance values of R11 and R12 are very low compared to the value of R10 and that the time constant of R10–C10 is relatively high, for the purpose which will be hereinafter set forth and is adjustable as desired by varying the values of resistor R10, and capacitor C10, the resistor R10 being advantageously a rheostat. The negative terminal of the capacitor C10 is connected to negative line N1.

The positive terminal of the transfer capacitor C11 is connected through the switch PB10 to line P2 and through series connected current limiting resistor R13 and diode CR1 to line P2, the diode CR1 being oriented as illustrated, with its cathode connected to line P2 and its anode directed toward the capacitor C11 positive terminal to provide a very high impedance to the flow of current into the capacitor and a low impedance to the outward flow of current therefrom. It should be noted that where diodes are recited in the claims, what is meant is a unilateral impedance diode having a high impedance to the flow of current in one direction and a low impedance to a flow of current in the opposite direction. Moreover, where the orientation of such diode is referred to, what is meant is its disposition relative to the flow of current, Thus, where diodes are oriented in a common direction relative to specified points their impedance to the flow of current to these points are commonly correspondingly high or low depending on the direction of orientation of the diodes. The negative terminal of the capacitor C11 is connected to the negative terminal of capacitor C10 through a diode CR4 oriented, as illustrated, with its cathode and anode connected to C10 and C11 resepectively, and is connected by way of switch PB12 to line P2 and to the positive terminal of capacitor C13 by way of a diode CR7, oriented as illustrated with its cathode connected to the condenser C13. The capacitor C12 is shunted by the oppositely oriented protector diode CR8 and has its positive terminal connected by way of a resistor R14 to the anode of a diode CR2 whose cathode is connected to line P2 and to the cathode of a diode CR9. The anode of diode CR9 is connected by way of switch PB11 to line P2, and is also connected to line N1. The negative terminal of capacitor C12 is connected to the anode of a diode CR5 whose cathode is connected

to the negative terminal of the capacitor C11, and is connected through switch PB13 to line P2. The positive terminal of condenser C13 is connected to line P2 through series connected resistor R15 and diode CR3 oriented like diode CR2, and is connected to the cathode of diode CR7 whose anode is connected to line P2 through switch PB12 and to the negative terminal of capacitor C11. The negative terminal of capacitor C13 is connected to the anode of diode CR6 the cathode of which is connected to the negative terminal of capacitor C12 and is connected by way of line G and through the parallel connected push button switches PBM to line P2. The capacitor C13 is shunted by the series connected resistor R16 and normally open relay contacts or switch SW2.

To effect the actuation of the lock or other associated mechanism in response to the transfer of a signal of adequate value from the capacitor C13 there is provided a multistage amplifier including an NPN transistor Q1 and PNP transistors Q2 and Q3. The base of transistor Q1 is connected to line P2 through series connected resistor R17 and switch PB13 and is connected to line G and the negative terminal of condenser C13 by way of a resistor R18. The emitter of transistor Q1 is connected to line G and the collector thereof is connected through resistor R19 to the base of the transistor Q3. The base of the transistor Q3 is connected through a resistor R23 to the emitter thereof and to the base of the transistor Q2 which in turn, is connected through a resistor R22 to line P1. The emitter of transistor Q2 is also connected to line P1. The collector of transistor Q2 is connected to the collector of transistor Q3 through the series connected resistor R20 and relay solenoid L, the latter actuating relay contacts SW1 and SW2 earlier identified. The solenoid L is shunted by a capacitor C14. A timing capacitor C15 connects the line P1 to the arm of a switch SW3 actuated by the relay solenoid L and including a normally open or disengaged contact SW3*a* and a normally closed or engaged contact SW3*b*. The contact SW3*b* is connected through a resistor 21 to line N1 and the contact SW3*a* is connected through a resistor R24 to line P1 and through a resistor R25 to the base of the transistor Q3. Also actuated by the relay solenoid L is a switch SW4 which may be employed to actuate the lock or other desired mechanism in any suitable manner.

Considering the operation of the circuit network last described when the push buttons are actuated in their coded sequence, in its normal dormant state, the network is in the condition illustrated and the capacitor C10 is fully charged. Upon the momentary closing of the switch PB10, a charge is transferred from capacitor C10 to C11 by way of resistor R12 and diode CR4. The successive momentary closing of the switch PB11 transfers a charge from the capacitor C11 to the capacitor C12 by way of resistor R13, diode CR1, line P2, switch PB11 and diodes CR9 and CR5. The closing of switch PB11 also effects the complete discharge of capacitor C10 through resistor R12 by way of lines N1 and P2. Following the release of switch PB11 switch PB12 is momentarily closed to transfer a charge from capacitor C12 to capacitor C13 by way of resistor R14, diode CR2, line P2, switch PB12 and diodes CR7 and CR6. The closing of switch PB12 also completely discharges capacitors C10 and C11, capacitor C10 through resistor R12, line P2, switch PB12 and diode CR4, and capacitor C11 through resistor R13, diode CR1, line P2 and switch PB12. Thereafter the momentary closing of switch PB13 discharges condenser C13 through resistor R15, diode CR3, switch PB13, and resistors R17 and R18 to thereby apply a positive signal to the base of transistor Q1. The closing of switch PB13 also discharges capacitors C10, C11 and C12; the capacitor C10 by way of resistor R12, line P2, switch PB13 and diodes CR4 and CR5; capacitor C11 by way of resistor R13, diode CR1, line P2, switch PB13 and diode CR5, and capacitor C12 by way of resistor R14, diode CR2, line P2 and switch PB13. The closing of any of the switches PBM discharges all of the capacitors C10, C11, C12 and C13, each through the closed switch and line P1, and capacitor C10 through resistor R12 and diodes CR4, CR5 and CR6; capacitor C11 through resistor R13 and diodes CR1, CR5 and CR6; capacitor C12 through resistor R14 and diodes CR2 and CR6; and capacitor C13 through resistor R15 and diode CR3.

The signal derived from the capacitor C13 and applied to the base of transistor Q1 is amplified by the circuit including the transistors Q1, Q2 and Q3 and the amplified output applied to the relay solenoid L to energize the same and actuate switches SW1, SW2, SW3 and SW4. The actuation of switch SW1 shorts the resistor R10 to effect the rapid recharging of the first capacitor C10 to its initial active state. The actuation of switch SW2 discharges capacitor C13 by shunting it with the resistor R18 and removes the input signal to the amplifier network. However, the simultaneous actuation of switch SW3 connects the charged capacitor C15 into the input circuit of transistors Q2 and Q3 to maintain transistor Q2 conducting and relay solenoid L energized. Upon discharge of the capacitor C15 primarily through resistor R24 and the parallel path through Q2 and Q3 and R25 the transistor Q2 drops in conductivity whereby the relay solenoid L is deenergized to a point returning the switches SW1, SW2, SW3 and SW4 to their normal retracted positions as illustrated. The interval during which the relay controlled switches remain actuated is determined by the circuit parameters including the time constant C15–R24 and the above parallel path and may be as long as desired, for example from substantially 0 to more than 100 seconds. The actuation of switch SW4 effects the opening of the lock or actuation of any other mechanism during the interval of energization of the solenoid L as aforesaid.

It is apparent from the above that the closing of any of the switches PB10 to PB13 out of sequence or the closing of any of the switches PBM disables the circuit network for the interval required to bring the capacitor C10 to its full charge. This penalty interval is determined substantially by the time constant R10–C10. Thus closing of any of the switches PBM discharges all the capacitors C10, C11, C12 and C13 thereby requiring the delay consumed by the charging interval before the network is able to respond to the coded sequence. Since the closing of any of the switches PB10 to PB13 before the next preceding associated transfer capacitor has been charged the corresponding capacitor does not receive the required charge and all the transfer capacitors preceding that capacitor and the capacitor C10 are fully discharged to disable the circuit for the penalty interval. Actuation of the push button switches during the penalty delay has no effect but to further discharge the capacitors and prolong the penalty delay. It should be noted that any desired number of transfer capacitors may be employed.

While there have been described and illustrated preferred embodiments of the present invention it is apparent that numerous alterations, changes and omissions may be made without departing from the spirit thereof. For example, if desired, the discharging current of the last capacitor C3 upon actuation of switch PB4 may advantageously be applied to the input of a transistor amplifier or other amplifier the output of which is delivered to the relay solenoid CR1. Similarly, the panel 13 may be remotely mounted at an entrance door or the like and connected by a cable to the balance of the device which may then be located in a relatively safe position inside the locked premises.

What is claimed is:

1. A combination lock mechanism comprising a plurality of successive capacitors including a leading capacitor and a trailing capacitor, an electrically responsive lock device, a source of D.C. charging current, a double throw switch associated with each of said capacitors and including an arm connected to a terminal of said capacitor and

a pair of first and second contacts selectively engageable by said arm, said first contacts of each of said switches being connected to the second contact of the next succeeding switch, the second contact of said trailing switch being connected to said source of D.C. current, means connecting the first contact of said leading switch to said electrically responsive lock device, a storage capacitor, means including a resistor element connecting said storage capacitor to a source of D.C. current, and selectively operable means for discharging said storage capacitor whereby to disable said electrically responsive lock device for a predetermined interval.

2. A combination lock mechanism according to claim 1 including bleeder resistors shunting each of said capacitors.

3. A combination lock mechanism according to claim 1 wherein said switches are of the momentary actuatable type.

4. A combination lock mechanism according to claim 3 wherein said first switch contacts are normally closed.

5. A combination lock mechanism according to claim 1 including a panel board, said switches being mounted on said panel board in an order unrelated to the order of said capacitors.

6. A combination lock mechanism according to claim 5 including additional switches mounted on said panel board and indistinguishable from said other switches.

7. A combination lock mechanism according to claim 5 including means for varying the connections between said switches and said capacitors.

8. A combination lock mechanism according to claim 1 including a panel board, said switches being mounted on said panel board in an arrangement unrelated to the order of said capacitor, said storage capacitor discharging means including a plurality of normally open switches connected across said storage capacitor, said switches being mounted on said panel board and being indistinguishable from said other switches.

9. A combination lock mechanism according to claim 1 wherein the resistance of said resistor element is variable.

10. In a coded actuating network a plurality of successive capacitors adjacent of which define successive trailing and leading capacitors, selectively independently actuatable first means for simultaneously connecting adjacent leading and trailing of said capacitors whereby to charge said leading capacitor from said trailing capacitor, and second means responsive to said actuation of said first means for substantially fully discharging said capacitors trailing the trailing capacitor of said adjacent capacitors.

11. A network according to claim 10 including means responsive to a charge on the leading of said capacitors.

12. A network according to claim 10 including means for slowly charging the trailing of said capacitors.

13. A network according to claim 10 including means slowly charging said charge capacitor.

14. A network according to claim 10 including means actuatable for a predetermined interval in response to the charge on the leading of said capacitors.

15. A network according to claim 14 including means actuatable with said charge responsive means for discharging said leading capacitor.

16. A network according to claim 10, means for concurrently rapidly discharging said capacitors including a plurality of parallel connected normally open switches and means connecting said parallel switches between said first and second terminals of said capacitors.

17. A network according to claim 10 including means connecting each of said switches between said charge capacitor first terminal and the second terminal of a capacitor trailing and once removed from the capacitor whose first terminal is connected to said switch.

18. A coded network comprising first, second and third capacitors, means for charging said first capacitor, selectively actuatable first means for transferring a charge from said first capacitor to said second capacitor, selectively actuatable second means for transferring a charge from said second capacitor to said third capacitor, and means responsive to the actuation of said second means for discharging said first capacitor.

19. A coded network comprising first and second capacitors, a current responsive device, means for charging said first capacitor, selectively actuatable first means for transferring a charge from said first capacitor to said second capacitor, selectively actuatable second means for substantially concurrently connecting said second capacitor to said current responsive device, and for discharging said first capacitor.

20. A combination lock comprising a plurality of successive capacitors including a leading capacitor and a trailing capacitor, an electrically responsive lock device, a D.C. current source including a storage capacitor connected by way of a resistor to a primary source of current, a plurality of normally open selectively operable switches shunting said storage capacitor, a double throw switch associated with each of said capacitors and including an arm connected to a terminal of said capacitor and a pair of first and second contacts selectively engageable by said arm, said first contacts of each of said switches being connected to the second contact of the next succeeding switch, the second contact of said trailing switch being connected to said D.C. current source, and means connecting the first contact of said leading switch to said electrically responsive lock device.

21. A coded network comprising a plurality of successive capacitors including a trailing charge capacitor and successive following transfer capacitors each of said capacitors having a pair of first and second terminals, means for charging said charge capacitor, means including first diodes connecting each of said transfer capacitor first terminals to said charge capacitor first terminal through respective of said first diodes, second diodes connecting said second terminal of each of said capacitors to the second terminal of the next trailing capacitor, the first and second diode of each pair thereof connected to a respective capacitor being oppositely conductively directed relative to said capacitor, and means including an independently operable normally open switch connecting each of said transfer capacitor first terminals to said charge capacitor first terminal.

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