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C. M. EDWARDS.
TELEGRAPH SYSTEM.
APPLICATION FILED APR. 9, 1912.

Patented May 27, 1913.

2 SHEETS—SHEET 1.

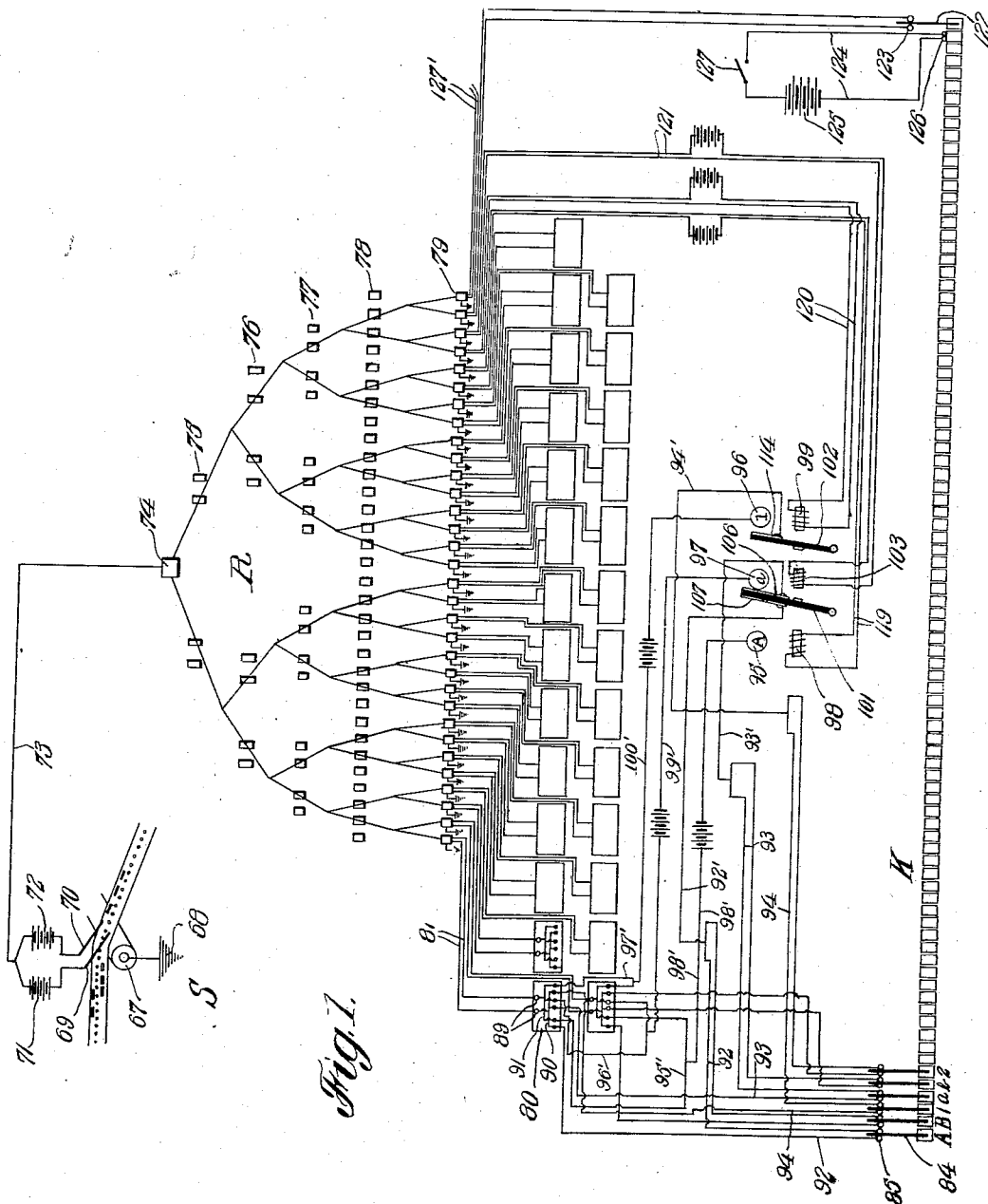


Fig. 1.

Witnesses

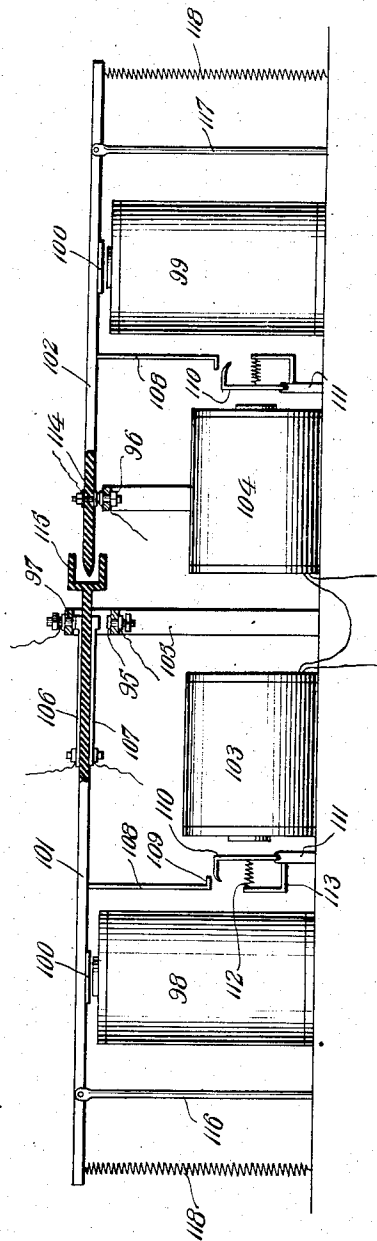
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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TELEGRAPH SYSTEM.

1,062,824.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed April 9, 1912. Serial No. 669,460.

To all whom it may concern:

Be it known that I, CLAUDE M. EDWARDS, a citizen of the United States of America, residing at Galveston, in the county of Galveston and State of Texas, have invented new and useful Improvements in Telegraph Systems, of which the following is a specification.

This invention relates to improvements in telegraph systems and has particular application to a selective telegraph system or apparatus whereby key boards may be operated from a distant or remote point, my present invention being directed to an apparatus or system for operating the key boards of linotype machines. It will be understood, however, that my invention in its useful application is not limited to this particular case as the same may be employed for operating other key boards, and apparatus of a similar nature.

In carrying out the present invention, it is my purpose to provide a system wherein by means of operating devices and selecting apparatus controlling such devices, the latter may be operated to actuate the keys upon the key board of a linotype machine or other apparatus.

It is also my purpose to provide a system or apparatus of the class set forth wherein by means of a series of actuating devices each controlling a group of actuating mechanisms, and means for selectively energizing the actuating devices, the actuating mechanisms may be operated to depress the keys upon the key board, a master or key selector being employed and controlling the various groups of actuating mechanisms so that the actuating mechanism of each group may be operated individually and in accordance with the operation of the selecting means.

Furthermore, I aim to provide a selective telegraph system or apparatus whereby the key board of a linotype or other machine may be operated from a remote or distant point, and which will be efficient and reliable in use, comparatively easy to install and maintain and capable of application to any type of machine or apparatus employing a key board or the like without changing the construction of the machine.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawings; Figure 1 is a diagrammatic view of my system. Fig. 2 is a view in elevation of the master or key selector, parts being shown in section. Fig. 3 is a detail view of the operating devices for the keys, and Fig. 4 is an enlarged view of a detail of one of the operating devices.

In the practice of my invention, a ribbon or tape is perforated in such manner as to facilitate the transmission of plus or positive and minus or negative impulses from the transmitter or sender of the system to the receiving apparatus thereof, in the application of such tape to the sender so that the key board may be operated by the actuating mechanisms in accordance with the impulses represented by the perforations in the tape. Should it be desired to operate a key upon the key board of a linotype machine bearing a capital letter, the tape has perforations therein, in advance of those representing such capital letter, whereby the master or key selector of my system is operated to permit the operation of the actuating mechanism controlling the key of such capital letter. Similarly, should it be desired to operate a key upon the key board bearing a figure or other character, the tape has perforations therein, in advance of those representing such figure or other character whereby the master or key selector is operated to permit the operation of the actuating mechanism controlling the key of such character. On the other hand, should one or more keys of capital letters or figures be operated and the following impulses upon the tape represent small letters, the tape has perforations therein, in advance of those representing such small letter or letters, whereby the master or key selector is operated to permit the operation of the actuating mechanism controlling each small letter, this condition of the master or key selector being the normal.

Referring now to the accompanying drawings in detail, S represents the sending station which may be located at any distance from the receiving apparatus R. In the present instance, a tape *t* having perforations therein adjacent to one side edge representing positive or plus impulses, and perforations adjacent to the opposite side edge representing minus or negative impulses and a central row of perforations to facilitate feeding of the tape, is mounted upon a conducting roller 67 which is

grounded at 68 and forms one side of the circuit of the sending apparatus, the opposite side of the circuit being formed by two brushes 69, 70 adapted to make contact with the roller through the two rows of perforations in the strip, such perforations representing the letters, figures and other characters and symbols to be transmitted. These brushes are connected with two batteries 71, 72 in such manner that one brush produces plus impulses and the other minus impulses.

The numeral 73 indicates the main line of the sending apparatus and is connected at one end to the batteries 71 and 72 and at its opposite end to the receiving apparatus R. This receiving apparatus may be of any suitable or preferred construction and is of the selective telegraphic type including actuating devices and selecting means, the latter being adapted to receive various electric impulses representing letters, figures and other characters, and controls the actuating devices in such manner that any predetermined or selected actuating device may be energized independently of the remaining devices. In the present instance, the receiving apparatus comprises an actuating relay 74 which normally maintains a zero position and is moved out of such position in one or the other direction according to the nature of the transmitted impulse; and successive series of selecting magnets, the first series comprising a magnet which responds to a transmitted plus impulse and a magnet which responds to a transmitted minus or negative impulse, each following series, likewise, comprising a pair of plus and minus magnets for each selecting magnet of the preceding series, automatic switches being also employed whereby the circuits are closed to different magnets of successive series according to the nature of the impulse. This selective receiving apparatus is illustrated diagrammatically in Fig. 1 and the free terminal of the line 73 is connected to the actuating relay 74, the system employed in the present form of my invention being identical to that disclosed in the patent issued to A. M. Roberts bearing Patent Number 897,762 and dated Nov. 1, 1908. Inasmuch as the operation of a receiving apparatus of this type is readily understood by those skilled in the art, it is thought that a detail description of the same is unnecessary. However, it may be here stated that the receiving apparatus is shown as including four successive series of selecting magnets indicated at 75, 76, 77 and 78, and a final set of actuating devices or magnets 79, the latter being in the form of circuit closers and are actuated selectively through the medium of the electric current impulses sent through the selecting magnets.

As is well known, the key boards of linotype machines usually embrace three banks or sets of keys, the capital letters being arranged in one bank, small letters in another bank and figures and other characters in the third bank. In accordance with my present invention, like keys of all banks are controlled by a group of actuating mechanisms, each group being under the control of one of certain of the actuating devices in the series 79. In the present instance, a distributor is interposed between each actuating device and the respective group of actuating mechanisms and leading into each distributor are a pair of conductors controlled by the respective actuating device or circuit closer, while from each distributor lead sets of conductors, each conductor of each set including in series an actuating mechanism for the respective key on the key board, and a selector common to the various groups of actuating mechanisms and operable to facilitate the manipulation of various keys on the key board. For the purpose of illustration, we will assume that the letters A, a and the figure 1 are like keys in the various banks. The actuating mechanisms controlling these several keys constitute a group and are controlled from a single distributor and the respective actuating device or circuit closer, but the circuit of only one of such actuating mechanisms is closed, according to the impulses preceding those representing the characters. In other words, if the key on a linotype machine representing A is to be actuated, the perforations on the tape preceding those representing the A and indicating that the following letter is a capital, will cause the transmission of impulses to an actuating device, which latter controls a local circuit having control of a movable element of the key selector, and thereby cause the actuation of the key selector to close the circuit of the individual actuating mechanism for the key bearing the A upon the linotype machine. Likewise, if it is desired to depress a key upon the linotype machine bearing a figure, the perforations in the tape preceding those representing such figure will cause the operation of the key selector to close the circuit to the actuating mechanism of the key on the linotype machine bearing the proper figure. This key selector normally maintains a position to effect the closing of the circuits of the actuating mechanisms of the small letters and is moved out of such position in the printing of capital letters and figures and other characters.

The distributors are indicated by the numeral 80 and each is connected up to one of the actuating magnets or circuit closers by way of conductors 81 controlled by such circuit closer. In the present instance, twenty-seven distributors are shown and connected

up to an equal number of actuating magnets, thirty-two of these latter magnets being illustrated. Certain of the remaining magnets of the actuating series control the key selector, three of such remaining magnets being employed in this case, while the remaining two magnets of the actuating series control the space bar on the linotype machine and a mechanism for actuating the matrices of the linotype machine to print in italics. This last named mechanism and its connection with the respective actuating magnet is not illustrated in the accompanying drawings.

In the drawings, the connections of only two of the distributors are shown and these are illustrated at the left of Fig. 1. The key board of the linotype machine is indicated at K and, as aforesaid, is segregated into three banks or sets of keys embracing capital letters, small letters, and figures and characters respectively. The actuating mechanisms for the keys are mounted upon a suitable platform or base P disposed in proximity to the key board, and each mechanism, in the present instance, comprises a standard 82 disposed adjacent to the respective key and carrying at its free end a bracket 83 to which is pivotally connected an angular arm or finger 84 designed to actuate the respective key on the key board and preferably composed of a plurality of telescopic sections so that wear and lost motion may be taken up. Adjustably mounted upon the standard 82 of each actuating mechanism is an electromagnet 85, while mounted upon each arm 84 within the influence of the respective magnet 85 is an armature 86, which, when the respective magnet is energized, is attracted by such magnet with the effect to depress the arm or finger and consequently operate the key upon the key board of the machine, a spring 87 of some suitable form being interposed between each arm 84 and the respective bracket and acting to return the arm to normal position upon the deenergization of the magnet. The bracket 83 of each actuating mechanism is also provided with a number of set screws 88, 88 designed to engage the extremity of the arm or finger within the bracket and adapted to be operated to regulate the throw of such arm.

Connected to binding posts 89, 89 in each distributor are the terminals of the conductors 81, while the binding posts in each distributor are in turn connected with bus bars 90, 91 respectively. Connected in multiple or parallel with the bus bar 90 in each distributor are conductors 92, 93 and 94 each including in series one of the magnets 85 of the group of actuating mechanisms controlled through the respective distributor. The conductors 92, 93 and 94 of each group are multiplied to common conductors 92', 93'

and 94' terminating in the master or key selector, while multiplied to the bus bar 91 of each distributor are conductors 95', 96' and 97', each terminating in a common conductor 98', 99' and 100', respectively. The last-mentioned conductors terminate in contacts 95, 97 and 96 respectively of the master or key selector and are adapted to form continuations of the conductors 92', 93' and 94' respectively, as will more fully hereinafter appear. This key selecting device, in the present embodiment of my invention, includes a pair of actuating magnets 98 and 99 within the influence of which are disposed armatures 100, 100 carried by levers 101 and 102, and release magnets 103 and 104. The contacts 97 and 95 are carried by a standard 105 and are located one above the other. The levers 101 and 102 are constructed of insulating material and mounted upon the opposite sides of the lever 101 are contact strips 106 and 107 connected to the terminals of the conductors 93' and 92' respectively and adapted to engage the contacts 97 and 95 respectively, according to the movement of the lever. Upon the energization of the magnet 98, the lever 101 is actuated to engage the contact 95 and is locked in engagement with such contact by means of a latching device consisting of an arm 108 provided with a hooked terminal 109 adapted to be engaged by a hook 110 pivotally mounted upon a bracket 111 and spring actuated in one direction by a coiled contractile spring 112 connected at one extremity to the hook 110 and at its opposite extremity to an arm 113 carried by the bracket 111. Thus, in the movement of the lever 101 under the action of the magnet 98, the hooked terminal 109 of the arm 108 will engage the hook 110 and actuate the same against the tension of the spring 112, the spring returning the hook 110 to its normal position immediately succeeding the passing of the hooked terminal 109 beyond the bill of the hook 110, thereby locking the contacts 107 and 95 in engagement with each other and bridging the conductors 92' and 98'. The lever 102 is equipped with a contact 114 fastened to the terminal of the conductor 94' and adapted to engage the contact 96 upon the energization of the magnet 99 and this lever 102 is also equipped with a latching device similar to that heretofore described with reference to lever 101. The contact strip 106 on the lever 101 normally engages the contact 97 and in order to break such contact when the lever 102 is actuated to engage its contact 114 with the contact 96, the lever 101 is provided with a yoked or bifurcated extremity 115 between the arms of which is disposed the adjacent extremity of the lever 102 so that in the operation of the last-named lever to engage the contacts 114 and 96, the lever 101 will be operated to

disengage the contacts 106 from the contact 97, the purpose of this construction being to prevent the electrical connection of pairs of cooperating contacts simultaneously. The yoke end of the lever 101 is constructed in such manner that the movement of the lever to one or the other of its positions will not affect the lever 102. The levers 101 and 102 are preferably pivoted upon standards or posts 116 and 117 respectively mounted beyond the respective magnets 98 and 99 relative to the position of the contacts, and the free ends of these levers are connected to contractile springs 118, 118 which act to release the same upon the deenergization of the magnets 98 and 99. To release the levers 101 and 102 from the action of the latching devices, the magnets 103 and 104 are energized with the effect to withdraw the hooks 110 from engagement with the hooked terminals of the arms 108, thereby permitting the springs 118 to restore the levers to their normal positions. If desired, the magnets 103 and 104 may be combined into a single magnet with oppositely disposed poles, as illustrated diagrammatically in Fig. 1. It is conceivable, however, that the structure of the selector just described may be changed or varied and such is contemplated in the practice of my invention. The magnet 98 is located in a circuit 119 including a suitable source of energy and controlled by one of the actuating magnets 79, while the magnet 99 is located in a circuit 120 including a suitable source of energy and also controlled by one of the magnets 79. Likewise, the release magnets are arranged in a circuit 121 having a suitable source of energy therein and controlled by one of the circuit closers or actuating devices 79. A key actuating device 122 similar in construction to the actuating mechanisms hereinbefore described has its actuating magnet 123 connected to one of the actuating magnets 79 for the purpose of operating the space bar of the linotype machine.

An independent circuit comprising conductors 124 and a source of energy such as a battery 125, has arranged therein a magnet 126 designed to shift the line of matrices after such line has been completed by the operation of the keyboard. This independent circuit, is normally open as at 127 and is closed in any suitable manner, as, for instance, by the tapper of the signal bell, after the last matrix has been deposited in the line, the closing of such circuit causing the actuation of the line shifter for the well known purpose. A circuit 127' is also terminally connected to one of the actuating magnets 79 and if desired may be connected up to suitable mechanism to throw the line of matrices, or certain of the matrices in the line, to a relatively angular position for the purpose of writing in "italics."

The operation of the key actuating mechanisms and key selector from the actuating devices may be briefly stated as follows: For the purpose of illustration, let it be assumed that the last actuating magnet or circuit closer of the series 79 to the left of Fig. 3 has been selected and energized for the purpose of causing the operation of the actuating mechanism controlling the key on the linotype machine bearing A. Thus, it will be seen that the bus bars 90, 91 of the respective distributor are bridged with the effect to close the circuits multiplied to such bars, each of these circuits including the conductors 92 and 95', 93 and 96' and 94 and 97', respectively, the conductors 92, 93 and 94 forming one side of such circuits being multiplied to the common conductors 92', 93' and 94' respectively, while the remaining conductors forming the opposite sides of the circuits, are multiplied to the respective conductors 98', 99' and 100', these last named common conductors including suitable sources of electrical energy. Preceding the energization of the said actuating magnet or circuit closer, the actuating magnet controlling the circuit 119 of the magnet 98 has been energized, owing to the perforations formed in the tape in advance of those representing the capital letter, whereby the lever 101 is operated to disengage the contacts 106 and 97 and engage the contacts 107 and 95, consequently bridging the common conductors 92' and 98' whereby the circuit through the conductors 92, 95' and 81 and the respective actuating mechanism is closed, while the remaining circuits and actuating mechanisms of this particular group remain open and inactive respectively. Thus, the key bearing the A upon the key board of the linotype machine is depressed. In event that a small letter such as a, for instance, should follow the capital letter, a circuit would be closed by one of the actuating magnets of the series 79 to the magnets 103 and 104 to release the latching devices, thereby permitting the lever 101 to assume its normal position and engage the contact 106 with the contact 97, the impulses sent into the actuating magnet, at this time, being due to the perforations formed in the tape t. When the contacts 106 and 97 are in engagement, the circuit including the conductors 93 and 96' wired to the respective common conductors 93' and 99', is closed so that the magnet 85 of the actuating mechanism controlling the key on the linotype machine bearing the small letter is energized with the effect to place such actuating mechanism in operation, the remaining actuating mechanisms of this group remaining inactive, as previously set forth. On the other hand, should it be desired to actuate a key upon the key board of the linotype machine bearing a character or figure

such as the numeral 1, the perforations in the tape preceding those representing such figure or character will cause the sending of impulses through the selecting magnets to energize the particular actuating magnet of the series 79 whereby the circuit 120 in which the magnet 99 is located, will be closed. The energized magnet 99 attracts the lever 102 thereby making contact at 114 and 96 and breaking contact between the contacts 96 and 107, with the effect to close the circuit including the conductor 94, common conductor 94', contacts 114 and 96, common conductor 100', conductor 97', the respective bus bar, the conductors 81, thence to the conductor 94 by way of the remaining bus bar, so that the following impulses may cause the operation of the actuating mechanism for the key bearing the particular figure, such impulses energizing the circuit closer or actuating device of the series 79 controlling the group of actuating mechanisms in which the particular one to be operated is located. In the present instance, the letters A, a and the numeral 1 are controlled from the distributor 80 at the left of the top row in Fig. 1, and the letters B, b and the numeral 2 controlled from the distributor at the left in the bottom row of said figures. Thus, it will be seen that a letter and figure or character in each bank of keys, or three characters upon the key board are controlled from a single actuating device by way of the respective distributor, the operation of the actuating mechanisms for the keys bearing such characters being dependent upon the impulses preceding those which represent the character to be printed. It will be noted that each circuit, including the conductors 81, bus bars 90, 91 and the conductors multiplied to such bus bars, of each group is connected in multiple or parallel with the respective common conductors terminating in the key selector so that subsequent to the operation of the key selector to the desired position, any circuit of any group may be closed to energize the respective actuating mechanism, independently of the remaining actuating mechanisms of the particular group and the other groups.

While I have herein shown and described one particular form of my invention and arrangement of the various mechanisms of my system, by way of illustration, it is to be understood that I do not limit myself to the details of construction and arrangement of the parts herein described and delineated, but that modification and variation may be made within the scope of the claims and without departing from the spirit of the invention.

I claim:

1. In combination, a series of electrically operated actuating devices, means whereby

an electric current may be directed to a particular actuating device to energize the same, a group of actuating mechanisms under the control of each actuating device, and means operable to control the individual actuating mechanisms under the control of the energized actuating device, said last-named means including an element normally operating to render one of the actuating mechanisms of the group under the control of the energized actuating device operative.

2. In combination, a series of electrically operated actuating devices, means whereby an electric current may be directed to a particular actuating device to energize the same, a group of actuating mechanisms under the control of each actuating device, and means operable automatically to control the individual actuating mechanisms under the control of the energized actuating device, said last-named means including an element normally operating to render one of the actuating mechanisms of the group under the control of the energized actuating device operative.

3. In combination, a series of electrically operated actuating devices, means whereby an electric current may be directed to a particular actuating device to energize the same, a group of actuating mechanisms under the control of each actuating device, and a selector operable automatically to control the individual actuating mechanisms under the control of the energized actuating device, said selector including an element normally operating to render one of the actuating mechanisms of the group under the control of the energized actuating device operative.

4. In combination, a series of electrically operated actuating devices, means whereby an electric current may be directed to a particular actuating device to energize the latter, groups of actuating mechanisms each under the control of certain actuating devices, and a selector operable from certain of the remaining devices whereby any one of the group of actuating mechanisms controlled by the energized actuating device may be operated, said selector including an element normally operating to render one of the actuating mechanisms of the group controlled by the energized actuating device operative.

5. The combination with a key board embracing a number of banks of keys, of a series of actuating devices, successive series of selecting devices whereby a current may be directed to a particular actuating device to energize the latter, a group of actuating mechanisms under the control of each actuating device and each adapted to operate a key in one of said banks, and a selector operable automatically and controlling the individual actuating mechanisms of the group under the influence of the energized actuat-

ing device whereby the key in any bank may be operated.

6. The combination with a key board, embracing a number of banks of keys, of a series of actuating devices, successive series of selecting devices whereby a current may be directed to a particular actuating device to energize the latter, a group of actuating mechanisms under the control of each actuating device and each adapted to operate a key in one of said banks, each actuating mechanism comprising a pivoted arm carrying an armature, and a magnet controlling said arm, and a selector-operable automatically and controlling the individual actuating mechanisms of the group under the influence of the energized actuating device whereby the key in any bank may be operated.

7. The combination with a key board embracing a number of banks of keys, of a series of actuating devices, means whereby a current may be directed to a particular actuating device to energize the latter, a group of actuating mechanisms under the control of each actuating device and each adapted to operate a key in each of said banks, each actuating mechanism comprising an angular arm formed of telescopic sections, a pivot support for said arm, and a magnet controlling the arm, and a selector operable automatically for controlling the individual actuating mechanisms of the group under the influence of the energized actuating device whereby the key in any bank may be operated.

8. In combination, a series of electrically operated actuating devices, successive series of selecting magnets whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common to the circuits of all groups and connected thereto in multiple, and a selector including stationary and movable contacts connected to adjacent terminals of the said common conductors and operable to bridge the common conductors to close any circuit of the group under the control of the energized actuating device.

9. In combination, a series of electrically operated actuating devices, successive series of selecting magnets whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common to the circuits of all groups and connected thereto in multiple, a selector including stationary and movable

contacts connected to adjacent terminals of the said common conductors and operable to bridge the common conductors to close any circuit of the group under the control of the energized actuating device, pivoted levers carrying said movable contacts, and means for swinging said levers about their pivots to engage and disengage the movable contacts with and from the stationary contacts respectively.

10. In combination, a series of electrically operated actuating devices, successive series of selecting magnets whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common to the circuits of all groups and connected thereto in multiple, a selector including stationary and movable contacts connected to adjacent terminals of the said common conductors to close any circuit of the group under the control of the energized actuating device, pivoted levers carrying said movable contacts, and electromagnets for swinging said levers about their pivots to engage and disengage the movable contacts with and from the stationary contacts respectively.

11. In combination, a series of electrically operated actuating devices, successive series of selecting magnets whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common to the circuits of all groups and connected thereto in multiple, a selector including stationary and movable contacts connected to adjacent terminals of the said common conductors and operable to bridge the common conductors to close any circuit of the group under the control of the energized actuating device, pivoted levers carrying said movable contacts, means for swinging said levers about their pivots to engage and disengage the movable contacts with and from the stationary contacts respectively, and means for locking said levers in operated positions.

12. In combination, a series of electrically operated actuating devices, successive series of selecting magnets whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common to the circuits of all groups and connected thereto in multiple, a

selector including stationary and movable contacts connected to adjacent terminals of the said common conductors and operable to bridge the common conductors to close any circuit of the group under the control of the energized actuating device, pivoted levers carrying said movable contacts, means for swinging said levers about their pivots to engage and disengage the movable contacts with and from the stationary contacts respectively, means for automatically locking said levers in operated positions, and means for relieving the levers of the influence of the locking means.

13. In combination, a series of electrically operated actuating devices, means whereby an electric current may be directed to a particular actuating device to energize the latter, a group of normally open electric circuits under the control of each actuating device and adapted to be closed thereby, an actuating mechanism in each circuit of each group, conductors common thereto in multiple, a selector including stationary and movable contacts connected to adjacent terminals of the said common conductors and operable to bridge the common conductors to close any circuit of the group under the control of the energized actuating device, pivoted levers carrying said movable contacts, means for swinging said levers about their pivots to engage and disengage the movable contacts with and from the stationary contacts respectively, and connections between said levers whereby when a certain one of the same is actuated to circuit closing position the other will be maintained out of circuit closing position.

14. In combination, a series of electrically operated actuating devices, means whereby an electric current may be directed to a particular actuating device to energize the same, a group of actuating mechanisms under the control of each actuating device, means operable to control the individual actuating mechanisms under the control of the energized actuating device, said last-named means including an element operating normally to render one of the actuating mechanisms of the group under the control of the energized actuating device operative, and operable out of normal position to render a

second actuating device of the particular group operative, a second element operable to render a third one of the particular group of actuating mechanisms under the control of the energized actuating device operative, and a connection between the said elements whereby in the operation of the second-named element, the first-named element will be actuated out of normal position.

15. In combination, a series of electrically operated actuating devices, successive series of selecting devices whereby an electric current may be directed to a particular actuating device to energize the latter, groups of actuating mechanisms each under the control of certain actuating devices, and a selector operable from certain of the remaining devices whereby any one of the group of actuating mechanisms controlled by the energized actuating device may be operated.

16. In combination, a series of electrically operated actuating devices, successive series of selecting devices whereby an electric current may be directed to a particular actuating device to energize the latter, a group of actuating mechanisms under the control of each actuating device, and means operable automatically previous to the energization of the particular actuating device and controlling the individual actuating mechanisms under the control of the energized actuating device.

17. In combination, a series of electrically controlled actuating devices, successive series of selecting devices whereby an electric current may be directed to a particular actuating device to energize the latter, groups of actuating mechanisms each under the control of certain actuating devices, and a selector operable from certain of the remaining actuating devices previous to the energization of the particular actuating device whereby any one of the group of actuating mechanisms controlled by the energized actuating device may be operated.

In testimony whereof I affix my signature in presence of two witnesses.

CLAUDE M. EDWARDS.

Witnesses:

JAMES G. FLYNN,
LEE H. EDWARDS.