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SELECTOR

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An object of our invention is to provide a selector for use in circuits for the purpose of operating a signal or the like in response to coded impulses, the parts of the device being comparatively simple and inexpensive to construct.

A further object is to provide a selector responsive to impulses in an electric circuit and having mechanism which is responsive to several codes of impulses, yet which is not responsive to certain other impulses, the mechanism being arranged to lock up after a predetermined number of such other impulses and remain locked up until coded impulses are again sent through the circuit.

More particularly, it is our object to provide a selector in which a control element for operating a signal or the like is moved to operative position by a series of code impulses which can be either a specific code of short and long impulses or a given series of long impulses only, lock-up mechanism being provided to prevent operation of the device after a predetermined number of short impulses only.

Still another object is to provide a selector in which a single electromagnet is employed having a quick responsive end and a slow responsive end with an armature for each end, the armature for the quick responsive end being operable whenever an impulse of current flows through the electromagnet, while the armature for the slow responsive end being attracted by the electromagnet only when an electric impulse of sufficient duration passes therethrough.

Another object is to provide a selector in which impulses of current may flow continually, such as those in a telegraph line, but the mechanism will remain in a locked-up condition until a long impulse is sent through the circuit, whereupon the parts become unlocked and coded impulses may then be sent so that with a great number of selectors in one circuit, only a certain one or a certain number of the selectors may be actuated to controlling or signalling position at will.

Another object is to provide a selector in which a code wheel is provided with projections which enter into the operation of the device and which can be changed as desired for the purpose of adjusting the selector to respond to any desired code of impulses.

Still a further object is to provide a selector which can be operated by a dial type impulse controller, the selector being responsive to either short impulses, groups of short impulses with long impulses between the groups, or by long impulses entirely or in combination with short im-

pulses or groups of short impulses produced by the dial type impulse controller and which is also responsive to any other type of impulse producing mechanism, such as a telegraphic key or the like.

With these and other objects in view our invention consists in the construction, arrangement and combination of the various parts of our device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a side elevation of a selector embodying our invention, showing the cover thereof and some other parts of the mechanism in section.

Figure 2 is a plan elevation on an enlarged scale of the main portion of the mechanism as taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view on the line 3—3 of Figure 2 showing a code wheel and the mechanism associated therewith without illustrating all the parts behind it.

Figure 4 is a similar sectional view on the line 4—4 of Figure 2, showing a control wheel and the parts associated therewith without illustrating all the mechanism behind it.

Figure 5 is a similar sectional view on the line 5—5 of Figure 2 showing a lock-up wheel and its associated mechanism; and

Figure 6 is an electrodiagrammatic view of our selector in a telegraph and calling dial circuit.

On the accompanying drawing, we have used the reference numeral 26 to indicate a base, preferably formed of insulating material. A base plate 28 is supported thereon and has secured to its ends an inverted U-shaped frame 30. A cover 32 surrounds the frame 30 and encloses the mechanism of the selector. It is retained in position by removable thumb nuts 34.

Within the casing 32, we provide an upstanding frame element 36 secured to the base plate 28 and to the cross bar of the frame 30. Supported thereon is an electromagnet 38 having a core 40. The core 40 has a quick responsive end 42 and a slow responsive end 44. Slow response is produced at the end 44 by means of a copper sleeve 46 acting as a retarder for the production of magnetism at the end 44 of the core 40 by causing delay in the effective magnetism at the end 44 until a time period after the electromagnet 38 is energized. For supplying current to the electromagnet 38, contact prongs 48 are provided which may be plugged into sockets for receiving them, such sockets being in a telegraphic line or other circuit designed to control the energization of the winding.

An armature 50, which we shall term a first actuator, is pivoted at 52. It is immediately responsive to current flowing in the winding 38.

Another armature 54, which we shall term a second actuator, is pivoted at 56. It is responsive to the energization of the winding 38 a time period after it is energized so that in operation, the armature 50 immediately responds and a portion of a second thereafter, the armature 54 responds providing the current impulse is of sufficient duration.

Side plates 58 are mounted on the frame 36 and support a shaft 60. On the shaft 60, a code wheel A is freely rotatable and is constrained to remain in an initial position with a stop 62 thereof against a stationary projection 64. A hairspring 66 is connected with the projection 64 and the hub of the code wheel A to constrain it to remain in the initial position illustrated in Figure 3.

The first actuator 50 is provided with a code wheel actuating pawl 68 adapted to advance the code wheel A step by step in accordance with impulses of the circuit for the coil 38. For holding the code wheel A against reverse movement, as would be caused by the hairspring 66, a holding pawl 70 is pivoted at 72 and constrained by a spring 74 to engage the teeth of the code wheel A which is in the form of a ratchet wheel. The holding pawl 70 has a pin 71 to engage in the teeth of the wheel A.

The code wheel A is provided with a series of openings numbered 2, 4, 5, 6, 8, 9, 12, etc. into which removable pins numbered 1, 3, 7, 10 and 11 can be screwed. These pins are placeable in any of the openings so that different code combinations can be provided on the code wheel. One wheel can be used for all combinations and the pins can be placed as desired for the particular code of impulses to which any selector is to be responsive.

Freely rotatable on the shaft 60 is a control wheel B. It is so balanced that it tends to remain in the full line position of Figure 4 due to more weight on one side of the shaft than on the other, a stop pin 76 in this position engaging a stationary lug 78.

The control wheel B is provided with a plurality of ratchet teeth and can be advanced step by step by a control wheel actuating pawl 80. The pawl 80 is actuated by a lever 82 pivoted at its lower end to the second actuator 54. The lever 82 is provided with a projection 84 adapted to strike one of the pins 1, 3, 7, 10 or 11 whenever they are in position to be so struck, as for instance in Figure 3 where the pin shown by dotted lines at 1^a is interposed in the path of movement of the projection 84 when the armature 54 is attracted by the core end 44.

When a pin is in such position as indicated at 1^a, then the lower end of the lever 82 will be swung toward the left with the lever pivoting about the pin 1^a by reason of the projection 84 engaging it and this will cause swinging toward the right of the upper end of the lever 82, as shown in Figure 3 for pulling the pawl 80 toward the right. This will advance the control wheel B clockwise the distance of one ratchet tooth and it is then held by a holding pawl 86. The holding pawl 86 is pivoted on the pin 72 and is constrained toward holding position by a spring 88. The holding pawl has a pin 87 to engage the teeth of the wheel B.

The control wheel B is provided with a contact 90 adapted to engage a stationary contact

92 after the wheel B has advanced a predetermined portion of a revolution. The contact 92 is supported on an L-shaped extension 94^a of an arm 94 of the back plate 58 and is insulated therefrom. The arm 94 is omitted from Figures 3, 4 and 5. The contact 90 is grounded through the wheel B, the frame 36 and the base plate 28.

A ground terminal 95 is connected with the base plate while a terminal 96 is connected with the contact 92. The terminals 95 and 96 may be inserted in appropriate sockets which are connected in a circuit to be controlled such for instance as a signal circuit. The terminal 95 need not necessarily be grounded.

The wheel B is provided with a pawl engager 98 adapted to engage the pawl 80 immediately after the contacts 90 and 92 are closed for the purpose of lifting this pawl out of the teeth, as shown by dotted lines in Figure 4, thus permitting the circuit through the contacts 90 and 92 to be made only momentarily and then broken. This is so that a momentary circuit only is established, although the element 98 can be omitted if it is desired to retain the circuit through the terminals 95 and 96 established.

A lock-up wheel C is freely rotatable on the shaft 60 and constrained by reason of its unbalanced design to remain with a stop pin 100 thereof in contact with the stationary stop lug 78. The wheel C has ratchet teeth and is adapted to be advanced step by step by a locking wheel actuating pawl 102 pivoted to the first actuator 50. A holding pawl 104 is provided having a pin 103 to engage the ratchet teeth of the wheel C. The pawl 104 is pivoted on the pin 72 and a spring 106 is provided to constrain it toward engaged position.

The holding pawl 104 is provided with an arm 108 adapted to be engaged by the second actuator 54 to be released thereby. The released position is shown by dotted lines in Figure 5 and it will be noted that the pin 103 also raises the actuating pawl 102. Likewise in Figure 3, the pin 71 also raises the actuating pawl 68.

The lock-up wheel C is provided with a lock-up stop 110 adapted to engage a spring 112 mounted stationarily and move it to the dotted line position shown in Figure 5 when the wheel moves to lock-up position. In the lock-up position, the pin 100 strikes a pawl raising arm 114 and tips it to the dotted line position. The pawl raising arm 114 has a pin engaging arm 116 adapted to engage the pins 71 and 87 to raise the pawls 68, 70, 80 and 86, thereby permitting the wheels A and B to return to initial position when the wheel C assumes lock-up position.

The holding pawl 104 is provided with a finger 118 adapted to engage under an end 120 of the pawl raising arm 114 when it is in raised position, as caused by the lock-up wheel C assuming its lock-up position and the armature 54 then tipping the pawl 104 to its dotted line position of Figure 5. This causes the pawls 68, 70, 80 and 86 to remain in disengaged position while the armature 54 is attracted to give the wheels A, B and C sufficient time to return to initial position, whereas without the finger 118, the arm 114 would drop to the full line position immediately after the wheel C starts to return to its initial position after being unlocked by the armature 54 being attracted.

Practical operation

When our selector is plugged into a circuit, such as a telegraphic circuit, the impulses in the cir-

cuit caused by the operation of a telegraphic key or other sending device will cause the armature 50 to vibrate because of successive impulses interspersed with open circuit conditions. These impulses are of short duration and consequently do not operate to attract the armature 54, but only the armature 50.

After six of these impulses have been received in the coil 38, the lock-up wheel C will have rotated to a position with the stop pin 100 raising the pawl lifting lever 114 to the dotted line position of Figure 5, whereupon further rotation of the wheel C is prevented by the lever 114 acting as a stop. The wheel will not rotate in the opposite direction because of the holding pawl 104. Thereafter even though additional impulses continue to energize the coil 38, no further mechanical action will result.

There is slight lost motion in the pawls and ratchet teeth to permit the pawls to drop into the teeth and this might cause a rattle as the impulses intermittently energize the coil 38 and accordingly we provide the spring 112 to take up the lost motion and place the parts under tension so that such rattling is eliminated.

At the same time the wheel C is advanced six teeth, the wheel A is likewise advanced, but as soon as the lever 114 is raised, the pin engaging arm 116 raises the pawls 68, 70, 80 and 86 so that the code wheel A is permitted to return to initial position and likewise the control wheel B is permitted to return to its initial position if it is in any other position.

The operation just described locks the mechanical mechanism against further operation instead of allowing it to continue to operate in response to the impulses in the coil 38, which is the case in most selectors now in use. Such continued operation, of course, is detrimental to the mechanism as it wears it out and gets it out of adjustment much sooner than when it operates only occasionally.

The positions of the ends of the pawls 68 and 102 can be adjusted with respect to the ratchet teeth of the wheels A and C by an adjusting screw 121 accessible through an opening 122 in the frame 30. The stroke of the pawl may be adjusted by a set screw 124 accessible through an opening 126 in the frame 30. The element 128 on the drawing is a leaf spring for returning the armature 50 to its initial position.

In Figure 6, we have illustrated how our selector is connected in a telegraph and calling dial circuit. The telegraph line is indicated at T. L. and fundamentally it is a line extending through several successive telegraph stations. The selector and dialing mechanism are connected into the telegraph line as to terminals 150 and 152 thereof. Anywhere along the telegraph line, current may be supplied to the line.

The terminals 48 of the electromagnet 38 of the selector are connected so that the electromagnet is in series with the telegraph line and with telegraph instruments to be operated by the current impulses over the line. The contacts 90 and 92 of the selector may be connected with a signal such as a bell 154 supplied by an independent source of current such as a battery 156.

The dialing mechanism comprises a dial 158 similar to those now in general use on telephones having the usual numbered openings for insertion of the operator's finger for operating the dial and the usual stop 160 for the operator's finger to engage when rotating the dial clockwise.

A shaft 162 extends from the dial 158 and has

a ratchet wheel 164 thereon. The teeth of the ratchet wheel coast with a spring arm 166 which has an extension 169 adapted to separate contacts 168 when the ratchet wheel 164 rotates counterclockwise.

A single pole double throw switch 170 is provided which normally cuts the dialing mechanism out of the line as when in the right hand position illustrated, but cuts it into the line when moved to the dotted position shown.

The switch 170 may be in the form of a telegraph key if telegraphic code signals are to be sent over the telegraph line after dialing a station or stations desired, or may be operated by lifting a telephone receiver if spoken signals are to be used.

When it is desired to operate the selector for controlling or signalling purposes, it can be unlocked by a long impulse in the coil 38 (as by moving the switch 170 to the dotted position of Figure 6) which moves the armature 54 from the position of Figure 1 to the dotted line position of Figure 5. The upper end of the armature engages the arm 108 of the pawl 104, causing it to be disengaged from the teeth of the lock-up wheel C and its pin 103 to lift the actuating pawl 102 (which has been moved to the right by the armature 50), all as shown by dotted lines in Figure 5. The finger 118 in this position holds the pawl raising arm 114 raised and thereby the arm 116 and the pawls 70, 86, 68 and 80 also raised so that the wheels A and B can return to their initial positions.

Thereafter a coded impulse may be sent through the coil 38 and for the particular code wheel A illustrated, the combination is 1, 2, 4, 3, 1. This is accomplished by one long impulse by operating a telegraph key or by opening the contacts 168 and then closing them again by using the dial 158 which, through the armature 50, advances the pin 1 to the position of 1^a and then causes the armature 54 to swing toward the left so that the projection 84 of the lever 82 engages the pin at 1^a (as shown by the full line position of the parts 54, 82, 84 and 80 in Figure 3) and rotates the control wheel B one tooth.

The contacts 168 are opened and then closed again by manipulating the dial 158 in the following manner. The code number 1 is the first of the combination. Therefore, the operator inserts his finger in the hole number 1 of the dial and rotates the dial clockwise until his finger is stopped by the stop 160. This causes the first tooth of the ratchet wheel 164 to snap past the spring arm 166 without causing any action on the contacts 168. The dial is then released and a spring 163 returns it to initial position with a stop 165 thereon engaging a stationary stop 167.

In the return or counterclockwise movement, the first tooth of the ratchet wheel 164 causes one separation of the contacts 168 and accordingly one closed circuit current impulse corresponding to the number 1 on the dial. Two teeth of the ratchet wheel 164 pass the spring 166 when number 2 of the dial is pulled up to the stop 160 and these two teeth cause two separations of the contacts 168 on return movement of the dial and so on.

Two impulses (a short one and a long one) are then sent through the coil 38, the short one rotating the wheels A and C each one tooth and the long one rotating them a second tooth and then the long impulse swings the armature 54 to advance the control wheel B another tooth. As it is advanced, the armature 54 strikes the arm

108 on the pawl 104 so as to allow the locking wheel C to return to initial position each time the control wheel B is rotated one tooth and thus prevent its advance to a lock-up position.

5 The first long impulse, the short one and then a long one just described are obtained when the dial 158 is used by dialing first the number 1 and then the number 2. Thereafter the numbers 4, 3 and 1 are dialed to advance the control wheel B 10 to the dotted line position of Figure 4, whereupon the contacts 90 and 92 are closed for energizing a signal circuit, such as a bell or annunciator.

As an illustration of a practical installation, the selector may be included in a telegraphic 15 circuit, which the majority of the time has messages passing through it produced by short impulses in a predetermined relation with respect to open circuit spaces between the impulses. When messages are not being transmitted, periodic impulses are transmitted to indicate that 20 the circuit is in operating condition. In the event that one station wants to make a special call to another one, a dial, telegraphic key or the like can be cut into the circuit for producing the long as well as short impulses and a 25 station having a selector with a given code combination can be signalled by dialing that combination. The operator at the station signalled can then connect in the circuit with a sounder or 30 telephone to receive instructions or the like from the sender.

Thereafter the regular telegraphic communication can be re-established and the first six impulses in the coil 38 will lock up the selector in 35 the manner already described.

Each time the armature 54 is brought forward, it unlocks the lock-up wheel C so that it will not become locked up and release the wheels A and B after six impulses. The number six is arbitrary. This is the minimum number for a code 40 combination which has digits of five or less. If a digit of six were in the combination, then the wheel C should be designed to advance seven places instead of six and so on. The number is 45 kept to a minimum to minimize rotation of the wheel C to lock-up position. Whenever it does operate to assume lock-up position, then the wheels A and B are released so that they are in position for coded impulses, which of course cannot be performed until after the wheel C is un- 50 locked by a long impulse attracting the armature 54.

Our particular arrangement of code wheel and lock-up wheel together with their relation to 55 each other makes it possible to call in a number of stations at one time by dialing 1s or a combination of 1s with coded impulses. For instance, the code wheel A, responsive to the code 1, 2, 4, 3, 1, is also responsive to a code of eleven 1s.

60 The first 1 dialed after the switch 170 is moved to the dotted position will advance the wheel B one tooth when the armature 54 is attracted. The second 1 dialed will not advance the wheel B, because the opening 2 is then in alignment 65 with the projection 84 and even though the armature 54 is attracted, it will not move the pawl 80 toward the right.

The third 1 dialed will cause the projection 84 to engage the pin 3 and pull up the wheel B another tooth. The fourth, fifth and sixth 1s 70 dialed will not affect the wheel B, while the seventh 1 dialed will and so on. Finally, the eleventh 1 dialed will cause the projection 84 to strike the pin 11 and rotate the control wheel B 75 to its final contact making position.

From the operation just described, it will be obvious that any number of selectors, regardless of their combinations, but which have combinations, the totals of the digits of which are eleven, will be simultaneously operated to controlling or 5 signalling position. Thus if a certain number of stations is to be called at once for a particular report or the like, they can be assigned code combinations, the digits of which total eleven and can all be simultaneously called by dialing 10 eleven 1s, whereas otherwise each would have to be called by its specific code combination and that would take considerably more time than by the method just described.

Certain other stations can be called simultaneously, for instance by dialing 1, 3, 4 and then 15 enough 1s to make eleven, whereupon all selectors having 1, 3, 4 as the first three numbers of their combinations and eleven or less as their total will be called. Combinations are also possible which do not have 1s and whereby several 20 selectors can be called in by other digits or combinations of digits.

The illustration just made places the dialing of 1s at one end of the combination. The 1s 25 can be at the other end or anywhere in between the ends and it is thus obvious that a great number of combinations can be worked out so that many different groups of stations can be simultaneously called, depending of course on the 30 way the code combinations are originally worked out.

Ordinarily it is known beforehand which groups are to be called simultaneously and the code combinations can be assigned accordingly. 35 Whenever one station is to be placed in another group, it is a simple matter to change the combination by removing some of the pins and placing them in other of the openings on the code wheel A.

When a combination other than 1, 2, 4, 3, 1 40 is dialed—that is, any combination having five numbers or less, the control wheel B will not be advanced far enough to engage the contacts 90 and 92. For instance, if 1, 2, 4, 3, 2 is dialed, 45 the control wheel will be advanced four steps by the proper dialing of 1, 2, 4 and 3 but when 2 is dialed, the number 12 opening of the code wheel A in Figure 3 will be in the position of the pin shown in dotted lines at 1^a and accordingly 50 when the armature 54 is attracted, the lock-up wheel C will be returned to its initial position, but the projection 84 of the lever 82 will not have any pin to pivot against and accordingly will not actuate the control wheel pawl 80 so as 55 to give the fifth step necessary to cause the contact 90 to engage the contact 92. When a mistake is made in any of the other numbers of the combination, the control wheel B will likewise miss out on one step so that it misses coming to the control position by that step. 60

The armature 54 is constrained to move away from the core 40 by a spring 129 which is preferably made adjustable. The period of delay 65 between the movement of the armature 54 after movement of the armature 50 may be adjusted by a set screw 130 which is accessible through an opening 132 in the frame 30. It has already been pointed out how the pins in the code wheel can be adjusted for changing the code. 70 Where a code of numbers has more than five digits, additional teeth can be formed in the wheel B or the position of the stop 78 can be changed.

In Figure 3, a tooth is omitted from the wheel 75

A as indicated by the arrow *a*. This is for the purpose of preventing more than a full revolution of the wheel A, as when the actuating pawl 68 turns it a full revolution and comes to the space *a*, it cannot turn it any further. If the wheel A were rotated a full revolution by the dial and then the short impulses in the line commenced to operate, there would be a tendency for the wheel A to rotate further, which it could not do because of the stop 62 striking the lower left side of the stationary stop 64, whereupon some of the parts might be broken or at least be prevented from operating unless the tooth *a* were missing.

It will be seen that we have provided a selector which is instantly responsive to a set of code impulses after a long impulse is provided to unlock the mechanism. Whenever short impulses are again fed through the circuit in which the coil 38 is positioned, the mechanism will lock up so that it does not continue to operate.

Although we have shown ratchet wheels as the elements operated by the actuators 50 and 54, other movable elements can be substituted and changes of this character and others may be made without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

We claim as our invention:

1. In a selector, a lock-up ratchet wheel, a code ratchet wheel, a control ratchet wheel, a movable actuator responsive to closed circuit current impulses and having an advancing pawl to move said lock-up and code ratchet wheels, said code wheel having code pins, a second movable actuator responsive to long closed circuit current impulses only and having an advancing pawl to move said control wheel, said second actuator being operable only if a code pin registers therewith at the time of actuation of the second actuator and holding pawls for each of said ratchet wheels, said second actuator, lifting the holding pawl of said lock-up wheel to return it to initial position when the second actuator responds to current impulses and means to lift the holding pawls of said code and control wheels after a predetermined movement of said lock-up wheel to thereby return them to their initial respective positions.

2. In a selector, a lock-up ratchet wheel, a code ratchet wheel, a control ratchet wheel, an actuator responsive to closed circuit current impulses and having an advancing pawl for said lock-up and code ratchet wheels, said code wheel having code pins, a second actuator responsive to long closed circuit current impulses only and having an advancing pawl for said control wheel operable only if a code pin registers therewith at the time of actuation of the second actuator, holding pawls for each of said ratchet wheels and a pivoted locking lever movable by said lock-up wheel after a predetermined movement thereof, said locking lever being associated with the advancing and holding pawls of said code wheel and said control wheel to return them to initial position upon lock-up position being assumed by said lock-up wheel, said second actuator coacting with the holding pawl of said lock-up wheel to return it to initial position when said second actuator responds to current impulses.

3. In a selector, a lock-up ratchet wheel, a code ratchet wheel, a control ratchet wheel, an

actuator responsive to closed circuit current impulses and having an advancing pawl for said lock-up and code ratchet wheels, said code wheel having code pins, a second actuator responsive to long closed circuit current impulses only and having an advancing pawl for said control wheel operable only if a code pin registers therewith at the time of actuation of the second actuator, holding pawls for each of said ratchet wheels, a pivoted locking lever moved by said lock-up wheel after a predetermined movement thereof and a cushioning element to cushion further movement of said lock-up wheel after it moves said locking lever, said locking lever being associated with the advancing and holding pawls of said code wheel and said control wheel to return them to initial position upon lock-up position being assumed by said lock-up wheel, said second actuator coacting with the holding pawl of said lock-up wheel to return it to its initial position when said second actuator responds to a current impulse

4. In a selector, a lock-up element, a code element, a control element, an actuator responsive to closed circuit current impulses, advancing means operable thereby for advancing said lock-up and code elements, said code element having code pins, a second actuator responsive to long closed circuit impulses only, advancing means operable thereby for advancing said control element only after a code pin registers therewith at the time of actuation of the second actuator, holding means for each of said elements and a locking element movable by said lock-up element after a predetermined movement thereof, said locking element being associated with the advancing and holding means of said code element and said control element to return them to their respective initial positions upon lock-up position being assumed by said lock-up element, said second actuator coacting with the holding means of said lock-up element to return it to initial position when said second actuator responds to current impulses.

5. In a selector, a lock-up element, a code element, a control element, an actuator responsive to closed circuit current impulses, advancing means operable thereby for advancing said lock-up and code elements step by step, said code element having code pin openings corresponding to the steps by which said code element is advanced, removable code pins in certain of said openings, a second actuator responsive to long closed circuit impulses only, advancing means operable thereby for advancing said control element only after a code pin registers therewith at the time of actuation of the second actuator, holding means for each of said elements and a locking element movable by said lock-up element after a predetermined movement thereof, said locking element being associated with the advancing and holding means of said code element and said control element to return them to their respective initial positions upon lock-up position being assumed by said lock-up element, said second actuator coacting with the holding means of said lock-up element to return it to initial position when said second actuator responds to current impulses.

6. In a code responsive selector included in a circuit having short impulses of current flowing therethrough, a lock-up element, a code element and a control element each having means for biasing it to a normal position, electromagnetic means for moving said elements comprising an

armature responsive to any impulses of current in said circuit and operative connections for advancing the lock-up element and the code element upon each actuation of the armature, a
5 second armature responsive only to long impulses in said circuit and operative connections whereby said second armature advances the control element upon each actuation thereof provided the
10 first armature has moved the code element to a position corresponding to one of the code numbers for which the selector is set, means for preventing further movement of the lock-up element after a predetermined movement thereof by repeated actuation of the first armature only and
15 for preventing return movement of the lock-up element, means operated by the lock-up element in its stopped position for causing the return of said code element and said control element to normal position and for preventing advancement of said code element upon further actuation of said first armature and means operated by the
5 second armature for returning the lock-up element to normal whereby the code element may be thereafter advanced by either long or short impulses and the control element may be advanced to control position by long impulses occurring in proper combination between the short
10 impulses while the lock-up element is prevented from reaching its lock-up position by the long impulses in the code combination.

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