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AUTOMATIC KEYER FOR CODE TRANSMITTERS

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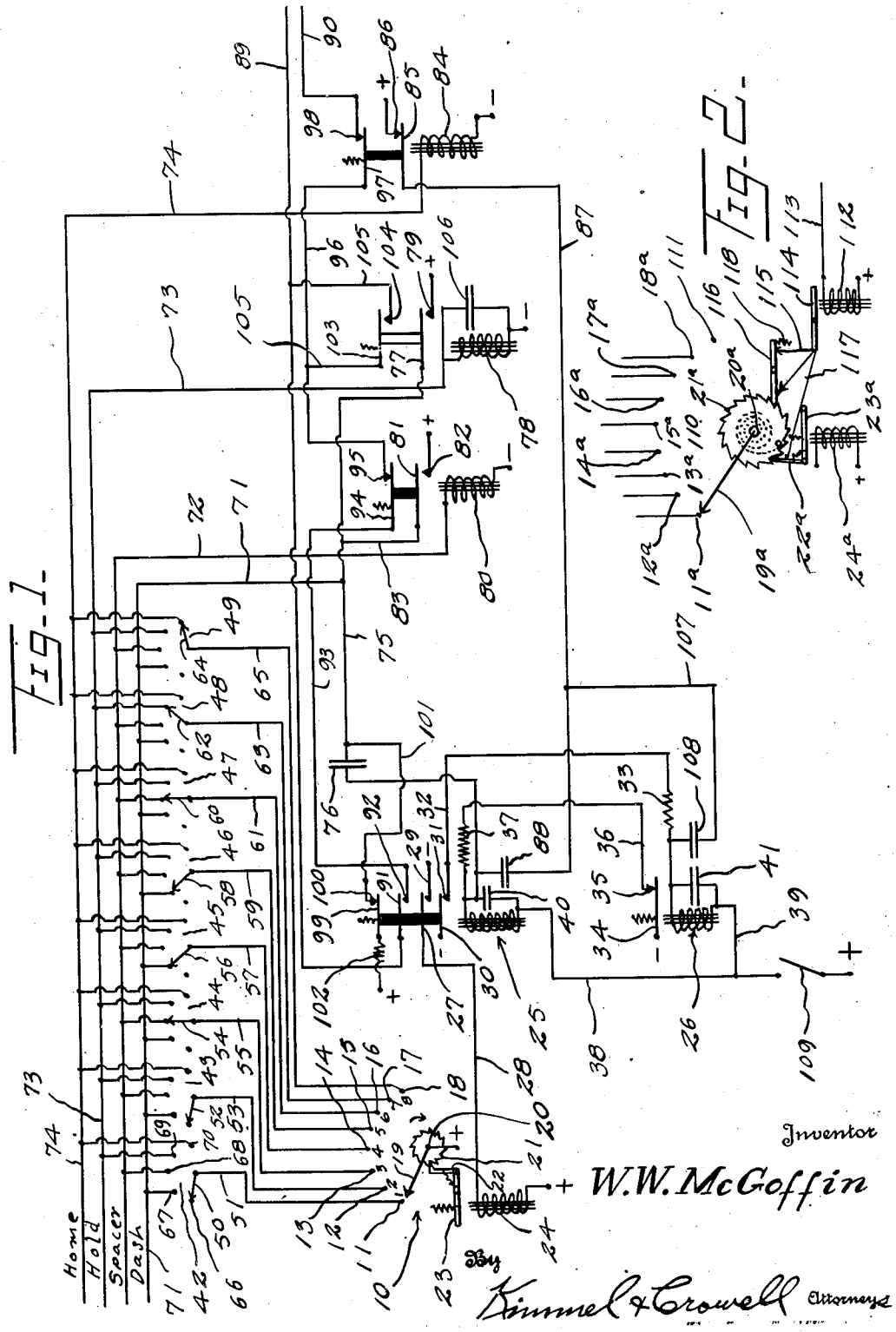


Fig. 1.

Fig. 2.

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AUTOMATIC KEYER FOR CODE TRANSMITTERS

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2 Claims. (Cl. 177—380)

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This invention relates to an automatic transmitting device for transmitting code signals to the input of a circuit to be pulsed.

An object of this invention is to provide an automatic electrically operated keyer or transmitter, which includes a plurality of relays which are so arranged and constructed as to provide for the transmission of Morse Code signals, the device being formed with a plurality of selectively adjustable switches so that code signals of desired type may be repeatedly transmitted.

Another object of this invention is to provide an automatic keyer which includes an improved means for repeating the selected signal combination.

A further object of this invention is to provide an automatic keyer of this type wherein the controlling relays may be of the type which will be delayed in releasing the armature, so as to form the necessary dashes or, if desired, the slow action or release of the relays may be effected through electrical discharge condensers which are charged at the time the relays are energized and hold the charge a sufficient degree to form the necessary dash. It is, of course, understood that slow releasing relays are of conventional type and where desired such slow releasing relays may be used in certain portions of the circuits to be hereinafter described in place of quick releasing relays having discharge condensers connected thereto.

To the foregoing objects, and others which may hereinafter more fully appear, the invention consists of the novel construction, combination and arrangement of parts, as will be more specifically referred to and illustrated in the accompanying drawings, but it is to be understood that changes, variations, and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawing:

Figure 1 is a diagrammatic view of an automatic keyer constructed according to an embodiment of this invention, and

Figure 2 is a fragmentary diagrammatic view of a modified form of this invention.

Referring to the drawing, the numeral 10 designates generally a selector switch structure which embodies a plurality of stationary contacts 11, 12, 13, 14, 15, 16, 17 and 18. A movable switch arm 19 is adapted to progressively engage the contacts 11 to 18 being mounted on a shaft 20. The shaft 20 has ratchet 21 secured thereto with which a pawl 22 engages. The pawl 22 is carried by a pivoted armature 23, which is spring pressed away from a relay 24. When the relay 24 is energized

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the armature 23 will be drawn thereto and the shaft 20 rotated to swing the movable contact arm or wiper 19 progressively from one stationary contact to the other. When relay 24 is energized armature 23 will be drawn thereto and pawl 22 will turn ratchet 21 and shaft 20 one step in a clockwise direction.

A timing structure embodying a pair of relay members 25 and 26 is connected to the relay 24 and the timing structure includes an armature 27 associated with the relay 25, which is connected by means of a conductor 28 to one side of the relay 24. The armature 27 is normally spring pressed away from a stationary contact 29, which is connected to one side of a supply source. A second armature 30, which is connected to one side of the supply source, is insulated from armature 27 and is normally spaced from a stationary contact 31 which is connected by means of a conductor 32 to one side of the relay 26. A resistor 33 is interposed in the conductor 32. An armature 34 is associated with the relay 26 being connected to one side of the supply source and is normally spring pressed to engage a stationary contact 35, which is connected by a conductor 36 to one side of the relay 25. A resistor 37 is interposed in the conductor 36. The other side of the relay 25 is connected by a conductor 38 to the other side of the supply source and a conductor 39 connects the other side of relay 26 to conductor 38.

An electrical condenser 40 is connected across the ends of the relay 25 and is of such capacity as to provide for the slow releasing of the armatures 30 and 27 when the circuit to the relay 25 has been broken. An electrical discharge condenser 41 is connected across the ends of the relay 26 and is also adapted to provide for keeping the relay 26 energized after the circuit to the relay has been broken. The capacity of the condensers 40 and 41 will determine the length of time the relays 25 and 26 will be maintained energized. A plurality of selectively adjustable switches 42, 43, 44, 45, 46, 47, 48 and 49 are connected to the stationary contacts 11 to 18 respectively and in each instance the movable switch arm or wiper is connected to the stationary contacts. Movable switch arm 50 is connected by conductor 51 to contact 11 and movable switch arm 52 is connected by conductor 53 to contact 12. Movable switch arm 54 is connected by conductor 55 to contact 13 and movable contact 56 is connected by conductor 57 to contact 14. Movable contact 58 is connected by conductor 59 to contact 15 and movable contact 60 is connected by conductor 61 to contact 16. Movable

contact 62 is connected by conductor 63 to contact 16 and movable contact 64 is connected by conductor 65 to contact 18. The switches 42 to 49 inclusive are of like construction and each includes a blank contact 66 and contacts 67, 68, 69 and 70. Contact 67 is connected to a dash circuit being connected to conductor 71 and contact 68 is connected to a space circuit being connected to conductor 72.

Contact 69 is connected to a hold circuit being connected to conductor 73. Contact 70 is connected to a home circuit being connected to conductor 74. Conductor 71 is connected to a conductor 75 which at one end is connected to one end of the relay 25 and a condenser 76 is interposed in the conductor 75. The conductor 75 is connected to a spring pressed armature 77 associated with a relay 78. The armature 77 is normally spaced from a stationary contact 79 which is connected to the positive side of the supply source. Conductor 72 is connected to one side of a relay 80, and the latter at the other side is connected to the supply source. Relay 80 has associated therewith an armature 81 normally spring pressed to an open position with respect to a stationary contact 82 which is connected to the positive side of the supply source. Armature 81 is connected by means of a conductor 83 to the conductor 75. Conductor 74 is connected to one side of a relay 84 which, at the other side thereof, is connected to the negative side of the supply source. Relay 84 has associated therewith an armature 85, which is normally spring pressed to engage a stationary contact 86 which is connected to the positive side of the supply source. Armature 85 is connected by means of a conductor 87 to conductor 75 between the condenser 76 and the relay 25. A condenser 88 is interposed in the conductor 87. A pair of conductors 89 and 90 are connected to a key circuit or transmitter and form the output side of the automatic keyer.

Conductor 89 is connected to an armature 91 insulated from armature 27 and associated with relay 25. Armature 91 is normally spaced from a stationary contact 92 and the latter is connected by means of a conductor 93 to an armature 94 associated with relay 80 and insulated from armature 81. Armature 94 is normally engaged with a stationary contact 95 and contact 95 is connected by means of a conductor 96 to an armature 97. Armature 97 is insulated from armature 85 being associated with relay 84 and is normally engaged with a stationary contact 98, which is connected to output conductor 90. An armature 99 is insulated from armature 91 being associated with relay 25 and is normally engaged with a stationary contact 100 which is connected by means of a conductor 101 to conductor 75 between condenser 76 and armature 77. A resistor 102 is connected to armature 99 and resistor 102 is connected to the positive supply source. An armature 103 is insulated from armature 77 being associated with relay 78 and is normally spaced from a stationary contact 104, which is connected by means of a conductor 105 to output conductor 89. Armature 103 is connected by means of a conductor 105 to conductor 96.

A condenser 106 is connected across relay 78 and is of the electrical discharge type so as to provide for maintaining the relay 78 energized after the switch arm 19 passes one of the contacts 11 to 18 which may be connected through one of the switch arms of switches 42 to 49, which is engaged with a stationary contact 69 of the latter switches. A conductor 107 is connected at one end to conductor 87 and at the other end is connected to conductor 32 between the resistor 33 and relay 26. A condenser 108 is interposed in conductor 107. Conductor 38, which is connected to the positive side of the supply source, has a main switch 109 interposed therein for regulating the operation of the device.

Referring now to Figure 2, there is disclosed a modified form of this invention which relates only to the selector portion of the circuit structure shown in Figure 1. In this modification the selector switch arm 19*a* is mounted on a shaft 20*a*, which has a coil spring 110 secured at one end thereto, so that after switch arm 19*a* has wiped over the stationary contacts 11*a*, 12*a*, 13*a*, 14*a*, 15*a*, 16*a*, 17*a*, 18*a* and finally reaches a release contact 111, spring 110 will return switch arm 19*a* to the first contact 11*a*. The return of the switch arm 19*a* is effected as follows: Relay 24*a* which is similar to relay 24 when energized rocks armature 23*a* and effects movement of pawl 22*a*, so as to provide for clockwise rotation of the shaft 20*a*. A releasing relay 112 is connected by conductor 113 to conductor 87 shown in Figure 1 between condenser 88 and armature 85 and has associated therewith an armature 114.

Armature 114 is connected by means of an arm 115 to a holding pawl 116 which normally engages ratchet 21*a*. A second arm 117 connects armature 114 to ratchet rotating pawl 22*a* so that when armature 114 is drawn toward relay 112, holding dog 116 will be rocked against the tension of spring 118 and at the same time pawl 22*a* will be rocked away from ratchet 21*a* thereby releasing shaft 20*a* for counter-clockwise rotation by the spring 110. In other respects the circuit arrangement of Figure 1 is associated with the automatic releasing structure shown in Figure 2.

In the operation of this device the several manual switches 42 to 49 are preset to provide the desired output impulses and the main controlling switch 109 may then be closed. With switch 109 closed relay 25 is energized closing the circuit to the stepper relay 24 and causing rotation of the stepper shaft 20 with wiping of the contact arm 19 over the points or contacts 11 to 18. The relay 26 is the interval relay, that is the relay regulating the interval between the dots and dashes and this relay with relay 25 constitutes the timing apparatus for the device. When relay 25 is energized a circuit will be completed through contact 31 to relay 26 energizing this relay and breaking the negative side to relay 25. When relay 26 is energized condenser 41 will build up energy so as to maintain the relay 26 energized for an interval after armature 30 is disengaged from the contact 31. This will provide the interval between the impulses, both dots and dashes. When relay 25 is energized the switch formed by the armature 91 and contact 92 will be closed thereby closing the circuit to the output key circuit. This circuit includes wire 89, contacts 91, 92, conductor 93, armature 94, contact 95, conductor 96, armature 97, contact 98 and conductor 90.

With the switches 42 and 43, as shown in Figure 1, on the first contacts of these switches which are the dot contacts, the dot impulse will be transmitted through the output key circuit. When stepper arm 19 is moved forwardly to the contact 13 of the stepper switch 10 and with switch 44 having the movable contact arm thereof connected to the space circuit embodying conductor 72, the circuit will be completed to space relay 80,

This relay, when energized, will break the circuit to the key circuit by drawing armatures 81 to 94 thereto. At this time the contacts 81 and 82 will close the circuit through conductors 83 and 75 to discharge condenser 76, so that relay 25 will be maintained energized for the desired space while at the same time the key circuit is broken so that no impulse will be transmitted through the key circuit.

When the energy of condensers 76 and 40 are discharged relay 25 will be deenergized and relay 26 will provide the necessary interval between the space and the next selected impulse which in this instance is a dash. When stepper arm 19 moves to contact 14 a circuit is broken through conductor 57 and switch arm 56 to conductor 71. The circuit then is completed through conductor 75 and condenser 76 to relay 25 and the latter will be maintained energized for the space of a dash while at the same time the key circuit will be closed by relay 25 through closing of the switch embodying the contacts 91 and 92. When stepper arm 19 moves to contact 17, which is connected by conductor 63 to switch 48 and the latter has the switch arm 62 connected to the hold circuit, relay 78 will be energized and condenser 106 will receive energy for maintaining relay 78 energized for a period after the breaking of the circuit through condenser 73 to relay 78. Energizing of relay 78 will close the key circuit through armature 103 and contact 104. In the next sequence stepper arm 19 is rotated to engage contact 18, which is connected by conductor 65 to switch arm 64 of switch 49.

The switch arm 64 is engaged with the home contact connected to conductor 74, so as to thereby energize relay 84. When relay 84 is energized the key circuit is broken through separation of armature 97 and contact 98. At this time the relay 25 will operate rapidly by draining of the electrical energy stored by condenser 40 through condenser 88. The relay 25 will thereupon operate in the manner of a vibrator so as to rapidly open and close the electric circuit to stepper relay 24 and cause the stepper arm to rapidly rotate to the beginning of the letter sequence. The resistors 33, 37 and 102 are provided to suppress spark in the several switches.

The disclosure shown in Figure 2 will operate in the same manner as that shown in Figure 1 except that when the electric circuit is completed to the home circuit 74, relay 112 will be energized and stepper arm 19a will be released from the stepper dog 22a and the holding dog 116, so that this stepper arm can be rotated by the spring 110 back to its starting position.

The automatic keyer as hereinbefore described will provide a simple keyer for code transmitters wherein any selected code characters can be transmitted without interchanging any of the elements in the system, such as in prior devices where code wheels are used for determining the particular letter or characters which are to be transmitted. In a device as hereinbefore described there may be as many manual switches as may be desired so as to provide for transmission of one or more letters and any number of characters in such letters. The particular code or letter transmitted can quickly be changed by variation of the switch positions. As long as switch 109 is closed the characters transmitted will be repeated.

The several relays are disclosed in the drawing as being of conventional construction having discharge condensers connected thereacross, but it will be understood that these relays may be of various types suitable for the purpose, which are slow closing or slow releasing. In the present circuit arrangement the switch embodying the armature 99 and the contact 100 which is connected from the positive through conductor 101 to conductor 75 is provided in order to maintain the discharge condenser 76 electrified for transfer of the electrical charge to the relay 25.

The exact configuration illustrated is regarded as the optimum, but some of the desirable results inherent in this disclosure may be obtained by various slight modifications including some departure from the exact configuration shown, and it is therefore requested that the scope of the invention should be regarded as limited only by the terms of the claims.

What I claim is:

1. An automatic keyer comprising a key circuit, a plurality of switches in said circuits, a stepper switch, a relay operator for said stepper switch, a plurality of relay operators for said first named switches, a plurality of manually adjustable switches connected to said stepper switch and said latter named operators, electromagnetic timing means connected to said stepper operator and certain ones of said first named switches, and means connected with said adjustable switches whereby said stepper switch operator may be rapidly vibrated to effect movement of said stepper switch to starting position when said stepper switch has moved through the operating cycle the length of which is determined by the adjustment of a particular one of said adjustable switches.

2. An automatic keyer comprising an output circuit, a plurality of input circuits, a plurality of switches connecting said input circuits to said output circuit, a plurality of adjustable switches connected to said input circuits, an electromagnetic stepper means connected to said latter switches, electromagnetic timing means connected to said stepper means, a discharge condenser connected across said timing means, a return circuit connected to said adjustable switches and said timing means whereby to break said output circuit and effect rapid operation of said timing means whereby said stepper means will be rapidly moved to starting position.

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