

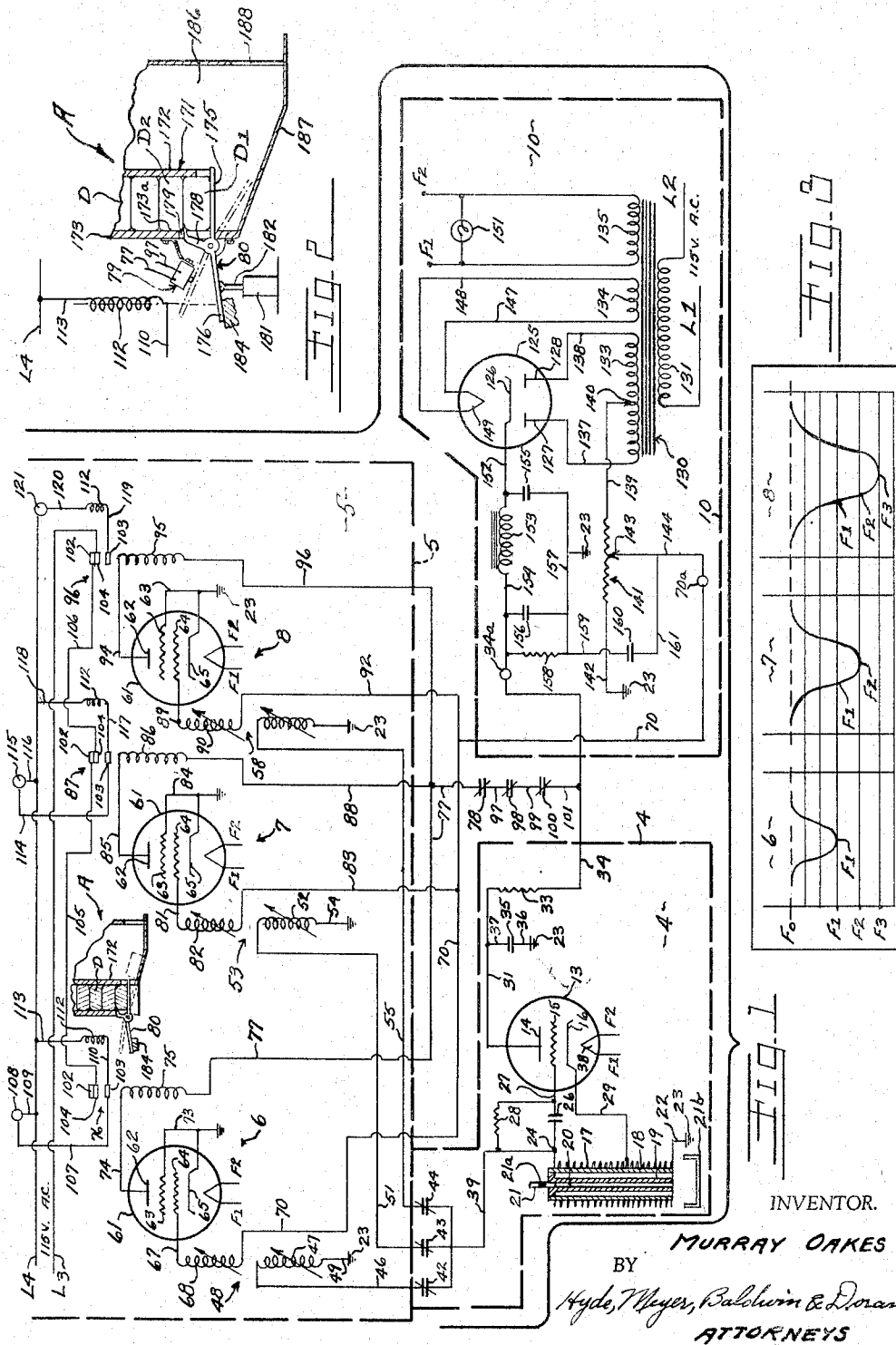
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TOKEN CONTROLLED DISPENSER

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TOKEN CONTROLLED DISPENSER

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This invention relates to an electrical signal generating device that is responsive to the introduction of means into its proximity to provide an electrical signal and/or signals characteristic of said means.

The signal generating device of the present invention, more specifically, is herein especially designed for use with an article dispensing machine, wherein said device is responsive to one or more tokens representing the purchase price of the article and/or articles in said machine being selectively placed in electrical proximity to said device whereby the latter is then responsive to initiate a signal and/or signals characteristic of said tokens and effective to actuate said machine and dispense one or more of said articles.

In present day article dispensing machines, the same are usually actuable by first inserting a token or coin therein and then manually pulling or depressing a lever and/or switch to effect the operation of the dispensing apparatus to release an article from said machine corresponding to said token or coin.

Other forms of dispensing machines are well known in the art such as the type wherein the weight and/or configuration of the coin or token placed into the device automatically releases a lever and/or actuates a switch which then is operative to initiate the dispensing cycle for the machine.

In dispensing machines of the type referred to wherein a plurality of different kinds of articles are dispensed therefrom, the dispensing apparatus for said machine is oftentimes very complex in structure. For instance, when it is desired to purchase a particular article, means must be provided in said machine that is operative to first determine what token or tokens and the number of each is inserted before the same can actuate the proper dispensing apparatus and release said article. Oftentimes, the dispensing machines are provided with a plurality of individual and separately operative coin receiving mechanisms wherein each actuates a single article dispensing apparatus. Still another type of machine requires a plurality of said coin receiving mechanisms which selectively combine to actuate an article dispensing apparatus representative of the inserted token or tokens.

The device of the present invention overcomes the above noted disadvantages, among others, of present day article dispensing machines by providing a unitary electrical signal generating device that is responsive to a token being placed in electrical proximity thereto and effective to initiate an electrical signal representative of the characteristics of said token, which signal is then operative to actuate the particular dispensing apparatus for the article corresponding to said token.

Therefore, a primary object of the present invention is the provision of an electrical signal generating device that is responsive to the introduction of means into its proximity to generate an electrical signal and/or signals representative of the characteristics of said means.

Another object of the present invention is the provision of an electrical signal generating device that is especially designed for use in an article dispensing machine and wherein said signal generating device is responsive to the introduction of a token into electrical proximity thereto to provide an electrical signal and/or signals representative of the characteristics of said token and which signal is then effective to actuate the dispensing apparatus for the article corresponding to said token.

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Still another object of the present invention is the provision of an electrical signal generating device that is especially designed for use in an article dispensing machine as referred to in the preceding objects and wherein said signal generating device is responsive to placing a token into electrical inductive proximity thereto which is effective to provide an electrical signal and/or signals having a frequency representative of the characteristics of said token.

Another object of the present invention is the provision of an electrical signal generating device that is especially designed for use in an article dispensing machine and wherein said signal generating device includes means to generate an electrical signal having a predetermined initial frequency, means responsive to the insertion of a token into electrical inductive proximity with said latter means effective to modify the initial frequency of said generated electrical signal such as to provide a modified electrical signal having a frequency corresponding to the characteristics of said token, and signal discriminating means attuned to the frequency of said modified signal and actuable thereby to initiate the operation of dispensing means for the article corresponding to said token.

Additional objects and advantages of the present invention will be apparent to one skilled in the art to which it pertains upon reference to the following detailed disclosure of a preferred embodiment, and to the accompanying drawings wherein:

Fig. 1 is an electrical schematic wiring diagram of the electrical signal generating device of the present invention and is shown connected to an article dispensing apparatus and conditioned to receive a token into electrical proximity to effect the actuation of said apparatus;

Fig. 2 is an enlarged fragmentary view, shown partly in section of the dispensing apparatus of a conventional article dispensing machine and shows said apparatus in electro-magnetic relation with the signal generating device of the present invention; and

Fig. 3 is a graph showing a plurality of frequency response curves representing the operational characteristics of the signal generating device of the present invention and to which the parts of the same are adapted to be selectively attuned such as to be responsive to a plurality of different tokens being selectively individually placed into its proximity.

Referring now to the drawings, the signal generating device of the present invention is herein embodied, merely for purposes of illustration, as utilized with an article dispensing machine having separate identical article dispensing mechanisms A (only one of which is shown) of a conventional construction, each of which is adapted to be individually operable to dispense a particular article in response to a token having characteristics which correspond to said article, being placed in electrical inductive proximity to said signal generating device. As hereinafter will be apparent, the signal generating device of the present invention may also be utilized with an article dispensing machine having any selected number of dispensing mechanisms similarly operative to that as is herein shown.

More particularly, the present form of signal generating device includes an oscillator unit 4 which is normally operative to generate an electrical signal having a predetermined frequency, which will be hereinafter referred to as the initial frequency signal, and a signal discriminating unit 5, comprising in the instant embodiment a plurality of identical electrical frequency response circuits, identified by the reference characters 6-8 respectively, and wherein each of said circuits is individually energized by a separate electrical signal generated by the oscillator unit in response to a particular token being placed into inductive proximity to the latter, whereby

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each separate signal has a frequency different from that of the initial signal and which is then operative to actuate a particular article dispensing mechanism of the machine corresponding to said token. The instant form of signal generating device also includes a power supply unit 10 which provides a plurality of sources of electrical power utilized to energize said device in a manner to be presently described.

With particular reference now directed to Fig. 1, the electrical circuitry of the oscillator unit 4 includes an electronic tube 13 preferably of the type known in the art as a medium mu-triode such as a type 6J5, and having an anode 14, a control grid 15 and a cathode electrode 16. Said oscillator unit also includes a tank circuit comprising a coil 17 mounted on a hollow cylindrical core 18, the latter being constructed of a suitable dielectric material and having a token receptacle 19 supported therein, being provided centrally with an elongated slot 20 adapted to slidably accommodate a token such as is indicated at 21. As above mentioned, the frequency response of the oscillator unit 4 is dependent upon the characteristics of the particular token placed in electrical proximity thereto. As seen in Fig. 1, the present type of token utilized is substantially disk-shaped in configuration, being formed of a suitable plastic or the like, and having a predetermined mass of magnetic material as indicated at 21a carried centrally therein. And, as will also be more fully explained, when a particular token is placed into the slot 20 of the core, it falls therethrough and its moving mass of magnetic material changes the operation of said oscillator unit such that the frequency of the signal generated by the latter while said token is falling is characteristic of the same. By way of example, one token having a magnetic material of a selected mass such as 10 grams, may be effective while falling through the slot 20 to change the operation of the oscillator unit such that it generates a signal having a frequency of 1000 cycles per second, whereas another token carrying a mass of magnetic material of say 20 grams, may be effective to cause the oscillator to generate a signal having a frequency of 900 cycles per second. It is of course clearly understood that these two examples are merely to illustrate the function of the type of token described herein and are not indicative of a particular construction nor of a mass of magnetic material necessary to cause the above described frequency response for the oscillator unit. It is also to be understood that other types of tokens may be utilized, for instance, the oscillator circuit may be functionally responsive in the manner just indicated to the regular metal coins used in commerce, but it is preferable to use the type disclosed herein in order to prevent an easy copy thereof to be made.

A suitable receptacle 21b may also be provided and placed below the core 18 in position to receive the token 21 as it drops out of the slot 20. The coil 17 has its lower end connected by wire 22 to a suitable common ground 23 for the device, whereas its upper end is connected through wire 24 through capacitor 26 and thence from the opposite side of said capacitor through wire 27 to the grid electrode 15 of said tube. A grid resistor 28 is connected in parallel with capacitor 26 and between the upper end of coil 17 and grid electrode 15 to provide the necessary bias for the latter as understood in the art. The cathode electrode 16 of the tube 13 is connected through wire 29 to a point on the coil 17 which is preferably spaced above its ground 23 approximately between one-third and one-fifth the length of said coil so as to enable said oscillator unit to be normally self excited to provide said aforementioned initial frequency signal. The anode 14 of said oscillator tube is connected through wire 31 to a load resistor 33, the opposite end of the latter being connected through wire 34 to terminal 34a of the power supply unit 10 wherein it receives a source of electrical voltage of approximate-

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ly 250 volts D.C. A capacitor 35 is also connected between the common ground 23 by wire 36 and the anode 14 of the tube 13 by wire 37 and is operative to by-pass RF transients to ground in the usual manner. Electronic tube 13 is also provided with the usual heater 38 which is connectable by conductors F1 and F2 to corresponding outlet terminals F1 and F2 in the power supply unit 10 wherein it receives a suitable filament voltage. The signal output from the oscillator unit 4, which will be more clearly hereinafter described, is taken from its grid circuit through wire 39 to the parallel connected side of a plurality of tunable capacitors, which in the instant embodiment of signal generating device consists of a series of three tunable capacitors as indicated by the reference characters 42—44. Each of said capacitors is connected in series circuit with a certain one of the aforesaid electrical circuits 6—8 respectively, of the discriminating unit 5. More specifically, the opposite side of capacitor 42 is shown to be connected by wire 46 to the upper end of the tunable primary winding 47 of transformer 48 of the discriminating unit circuit 6, the lower end of said primary winding being connected through wire 49 to the common ground 23. In this manner, the input circuit of said discriminating unit circuit is connected in series relation with tunable capacitor 42 and receives a signal of a predetermined frequency from the latter, which will be hereinafter more fully explained, and which signal is then effective to energize said circuit and cause the actuation of the dispensing mechanism A connected in electrical circuit therewith to dispense an article from the latter. In like manner, the opposite side of tunable capacitor 43 is connected by wire 51 to the upper end of the tunable primary winding 52 of transformer 53, in the discriminating unit circuit 7, the lower end of said primary winding being connected through wire 54 to the aforesaid ground 23. The input circuit of the discriminating unit circuit 7 is thereby connected in series relation with the tunable capacitor 43 and effective to receive a signal of a second predetermined frequency therefrom to cause a similar actuation to said circuit and operate a dispensing mechanism (not shown) but similar to the mechanism A connected with the aforementioned discriminating circuit 6. Likewise, the opposite end of the tunable capacitor 44 is similarly connected by wire 55 to the upper end of the tunable primary winding 57 of the transformer 58 in the input circuit of the discriminating unit circuit 8, the lower end of said primary winding being connected by wire 59 to the aforementioned ground 23, whereby said circuit receives a signal of a third predetermined frequency from the capacitor 44 effective to actuate said circuit and cause the operation of a dispensing mechanism (not shown) which is also similar to mechanism A.

As above mentioned, the electrical configuration of each of the discriminating unit circuits 6—8 is identical and includes an electronic tube 61 preferably of the thyratron type 2050 and having an anode 62, a screen grid electrode 63, control grid electrode 64 and a cathode electrode 65. Said tube is also provided with the usual heater 63a connectable by conductors F1 and F2 to the corresponding terminals F1 and F2 of the power supply unit 10.

In the discriminating unit circuit 6, the control grid electrode 64 of the tube 61 is connected by wire 67 to the upper end of the tunable secondary winding 68 of the transformer 48, whereas the opposite end of said winding is connected through wire 70 to the terminal 70a of the voltage supply unit 10 wherefrom it receives a negative bias voltage of approximately 12 volts D.C. the source of which will be presently described. The screen grid electrode 63 and cathode electrode 65 are connected together by wire 73, the latter also being connected to the aforementioned ground 23 for the device. The anode electrode 62 of said tube is connected by wire 74 to one end of the coil 75 of an electromagnetic

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relay 76, the opposite end of said relay coil being connected by wire 77 to one side of a normally closed contact 78 of a switch 79, the latter being mounted on the dispensing mechanism A in the path of the dispensing lever 80 thereof as is shown more clearly in Fig. 2, the purpose for which will be presently explained.

In like manner, the control grid electrode 64 of the tube 61 in the discriminating unit circuit 7 is connected by wire 81 to the upper end of the tunable secondary winding 82 of the transformer 53, the opposite end of said winding being connected through wire 83 in parallel with the grid bias supply wire 70 of the discriminating unit circuit 6 and thence to the terminal 70a of the voltage supply unit 10 wherein it is connected to the aforementioned negative bias voltage. The screen grid electrode and cathode electrode 65 of said tube in the discriminating unit circuit 7 are also connected together by wire 84 and also to the aforesaid common ground 23. The anode electrode 62 of said tube is connected by wire 85 to one end of the coil 86 of an electromagnetic relay 87, the latter being identical in structure to the coil in the relay 76 for the discriminating unit circuit 6. The opposite end of the coil 86 is connected by wire 88 in parallel with the aforesaid wire 77 and also to said one side of the normally closed contact 78 of the switch 79.

Similarly, the control grid electrode 64 of the electronic tube in the discriminating unit circuit 8 is connected by wire 89 to the upper end of the tunable secondary winding 90 of the transformer 58, the opposite end of said winding being connected through wire 92 in parallel with the aforementioned grid bias wires 70 and 83 of the discriminating unit circuits 6 and 7 respectively, and also to the terminal 70a of the voltage supply unit 10 wherefrom it receives the aforesaid negative source of voltage of approximately -12 volts D.C. The screen grid electrode 63 and cathode 65 of said latter tube are also connected together and to the ground 23 for the device. The anode electrode 62 of said latter tube is connected by wire 94 to one end of the coil 95 of an electromagnetic relay 95, the latter being similar in structure to the relays 76 and 87. The opposite end of said relay coil is thence connected by wire 96 in parallel with the aforementioned wires 77 and 88 in the discriminating unit circuits 6 and 7 respectively, and also to said one side of the normally closed contact 78 of the aforementioned switch 79. The opposite side of said normally closed contact is connected by wire 97 to one side of a normally closed contact 98, the latter being contained within a switch mounted on the dispensing mechanism for the discriminating unit circuit 7 in the same operative position as the switch 79 in the dispensing mechanism A for the discriminating unit circuit 6 and similarly actuable by the dispensing lever for the same. In like manner, the opposite side of contact 98 is connected by wire 99 to one side of a normally closed contact 100, the latter being contained within a switch similarly mounted and actuable by the dispensing mechanism for the discriminating unit circuit 8 as is the aforementioned switch 79 and normally closed contact 78 of the latter in said discriminating circuit 6. The opposite side of contact 100 is, in turn, connected by wire 101 in parallel with wire 34 and also to the terminal 34a wherein it is in circuit with the aforementioned electrical voltage source of 250 volts D.C.

The electromagnetic relays 76, 87 and 96 in each of the discriminating unit circuits 6-8 respectively, are preferably of the type shown in the drawings and defined in the art as a single pole, double throw relay having a pair of stationary contacts 102 and 103 spaced on opposite sides of a movable contact 104. Said latter contact is carried by the relay armature (not shown) and is normally in engagement with the stationary contact 102, thereby defining what is commonly referred to as a normally closed condition or contact for said relay.

The circuitry for said relay contacts includes the mov-

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able contact 104 in the relay 76 for the dispensing unit circuit 6 which is connected in series circuit by wire 105 to the stationary contact 102 of the relay 87 in the discriminating unit circuit 7. In like manner, the movable contact 104 of said latter relay is connected by wire 106 to the stationary contact 102 of the relay 96 in the discriminating unit circuit 8. The movable contact 104 in said latter relay is connected to line conductor L3 of a suitable source of electrical energy, which in the instant form is shown to be a source of alternating current voltage of approximately 115 volts as indicated in Fig. 1. The stationary contact 103 of the relay 76 is connected by wire 107 to an indicator lamp or the like as indicated at 108, the latter thence being connected by wire 109 to line conductor L4 of said source of electrical energy. The stationary contact 103 of the relay 76 is also connected by wire 110 to the lower end of the coil 112 in the solenoid actuating mechanism for the dispensing apparatus A in said unit circuit. The opposite end of said solenoid coil is connected by wire 113 to the aforementioned line conductor L4.

In like manner, the stationary contact 103 of the relay 87 in the discriminating unit circuit 7 is connected by wire 114 to one side of a suitable indicating lamp or the like 115, the latter, in turn, being connected by wire 116 to the aforesaid line conductor L4. Said latter relay contact is also connected by wire 117 to the lower end of the coil 112 for the solenoid actuating apparatus in the dispensing mechanism of the discriminating unit circuit 7. The opposite end of said coil is thence connected by wire 118 to line conductor L4.

The stationary contact 103 of the relay 96 in the discriminating unit circuit 8 is likewise shown to be connected directly by wire 119 to one end of the coil 112 of the solenoid actuating apparatus for the dispensing mechanism used in conjunction with said discriminating circuit whereas the opposite end of said coil is connected by wire 120 to one end of a suitable indicating lamp or the like as indicated at 121, the opposite end of said indicating lamp being connected directly to the line conductor L4.

The instant form of signal generator device also includes a power supply unit 10 herein shown to be of conventional form and including a full wave rectifying circuit consisting of electronic tube 125 of the class known as a 6X5 and having a cathode electrode 126 and a pair of anode electrodes 127 and 128. Said power supply unit also includes a power transformer 130 having a primary winding 131 connected across a suitable electrical A.C. voltage source as indicated by the references L1 and L2, and a plurality of secondary windings as indicated by the references 133-135. One end of the secondary winding 133 is connected by wire 137 to the anode 127 of tube 125, the opposite end of said winding being connected in like manner through wire 138 to the anode 128 of said tube. The wire 139 connected to the center tap 140 of said secondary winding connects to one end of a variable potentiometer as indicated at 141, whereas the opposite end of said potentiometer connects through wire 142 to the common ground for the device. The adjustable top of said potentiometer as indicated at 143 is positioned to pick off a negative voltage of approximately -12 volts D.C. which is then transmitted by wire 144 to the aforesaid terminal 70a thereby supplying the aforementioned grid bias for the tube 61 in each of the discriminating unit circuits 6-8 respectively. The secondary winding 134 of the power transformer 130 has its ends connected by wires 147 and 148 to the filament 149 of the tube 125 and hence supplies A.C. voltage of approximately 6.3 volts to the latter. The secondary winding 135 is similar to the above described filament winding, its opposite ends connecting to outlet terminals F1 and F2 wherein a supply of voltage may be applied to each of the filaments in the above described oscillator and discriminating circuits of the instant

form of signal generating device. An indicating device such as is shown at 151 may be connected across the secondary winding 135 being effective to provide a visual indication whenever the power supply unit 10 is put into operation.

The cathode electrode 126 of the tube 125 is connected through wire 152 to one end of a filter consisting of a choke 153, the opposite end of which connects through wire 154 to the aforementioned voltage terminal 34a. Said filter also includes condensers 155 and 156 connected to opposite ends of the choke 153 and also to the common ground 23 for said device by means of wire 165. A load resistor 158 is connected across the condenser 156 and in series by means of wire 159 with condenser 160, the opposite end of the latter connecting by means of wire 161 to the adjustable arm 143 of the potentiometer 141, and also in circuit with the terminal 70a. With this last described circuitry, a source of B+ voltage of approximately 250 volts D.C. is available between the outlet terminal 34a and the aforesaid common ground 23 which is then connectable through lead wire 34 and other conductors associated therewith as above described to the anode electrodes in each of the electronic tubes in the oscillator and signal discriminating units circuits.

Before describing the manner in which the above described signal generating device of the present invention is intended to function an cause the selective actuation of one of a plurality of article dispensing mechanisms such as is illustrated by the mechanism A to dispense an article therefrom corresponding to a token or coin disposed in electro-magnetic proximity to said device, a brief description of the said type of dispensing mechanism herein shown will be given. It is first of all apparent to the skilled artisan that many forms of dispensing mechanism may be utilized, but the one illustrated herein is of very simple configuration while yet being very efficient in operation, and includes an article container 171 having walls 172 and 173 disposed in vertical spaced relation to slidably accommodate a stack of articles D therebetween.

The dispensing lever 80, as above identified, is pivotally attached at its medial part to a shoulder 173a formed integral with the container wall 173, and as is shown in Fig. 2 said lever is also integrally provided with a dispensing leaf 175 extending beneath and substantially completely across the aforesaid container walls 172 and 173. The said dispenser lever is also integrally provided with a driving part 176 extending outwardly of the medial pivotal portion and in substantially an opposite direction to that of said dispensing leaf. Said lever is likewise formed at said medial part with an upstanding keeper arm 178 having a finger 179 depending therefrom and which is adapted to be moved in between the next article to be dispensed from said container and the one directly thereabove, being effective thereby to prevent the latter from falling out of said container during the dispensing cycle for the said next article.

The aforementioned electrical switch, having the normally closed contact 78, 98 or 100, depending upon which discriminating unit circuit 6, 7 or 8 respectively utilized therewith in the present form of signal generator device, is mounted on the shoulder 173a such that it is in the path of movement of the driving part 176 of said actuating lever. Said switch is hence operable by the latter to open its closed contact and disconnect the above described B+ voltage of 250 volts D.C. from said oscillator and discriminating unit circuits whereby the same are in effect "shut-off" or in an inoperative condition.

The instant form of dispensing mechanism is likewise provided with a dashpot 181 or the like having an arm 182 connected to the driving part 176 of the dispensing lever 80, and which is adjustable in conventional manner to have a predetermined stroke period and thus provide any preselected time period for said dispensing lever to

complete its article dispensing movement or clockwise actuation as seen in Fig. 2. The article dispensing mechanism also includes the aforementioned coil 112 which is energized in a manner to be later more fully explained to cause the actuation of the dispensing lever 80. Said lever is shown in its non actuated condition in Fig. 2 wherein the driving part 176 rests upon a suitable abutment 184 of the dispensing mechanism. Said mechanism, in turn, is normally located in a suitable chamber of the machine such as indicated at 186 in Fig. 2, and which also has an inclined chute 187 opening to the exterior of the said machine as at 188 to enable the dispensed article to be easily removed from the same.

Having thus described the preferred form of signal generating device of the present invention, the manner in which the same is operative in an article dispensing machine having a plurality of article dispensing mechanisms, such as mechanism A, to selectively actuate one of the latter in response to a particular token being placed in electrical proximity thereto will now be described.

Assume that the instant form of signal generating device is constructed having the following circuit parameters.

First, that the initial frequency F_0 of the oscillator unit 4, with all components connected and functioning, is slightly higher than the highest frequency to which any of the tuning transformers 48, 53 or 58 will respond to cause the energization of its associated electronic tube 61.

With reference directed to Fig. 3, the left hand curve illustrates the frequency response characteristics of the oscillator unit 4 when a first token or coin having a predetermined mass of magnetic material is dropped through the core 19 of the coil 17. It is seen that the frequency of the oscillator signal is lowered to a level designated hereinafter as F_1 and then rises again to the initial frequency F_0 .

In like manner the middle curve in Fig. 3 illustrates the frequency response characteristics of the oscillator unit 4 when a second token or coin having a different mass of magnetic material is dropped through said core. It is seen that the frequency of the oscillator signal is lowered to the aforesaid frequency F_1 and then beyond the same to the frequency F_2 ; then allowed to rise again to the united frequency F_0 . Also, the right hand curve of Fig. 3 similarly shows the frequency response characteristics of the oscillator unit 4 when a third token or coin having still another predetermined mass of magnetic material is dropped through said oscillator core. It is seen that the frequency of the oscillator signal is lowered to and beyond each of the aforesaid frequencies F_1 and F_2 to a level designated hereinafter as F_3 and then again allowed to rise again to the initial frequency F_0 .

Secondly, that the condenser 42 and transformer 48 in the aforesaid circuit 6 are tuned to the frequency F_1 , whereas, the condenser 43 and transformer 53 of the circuit 7 are each tuned to the frequency F_2 . Likewise, that the condenser 44 and transformer 58 of the circuit 8 are tuned to the aforesaid frequency F_3 .

Thirdly, that the negative bias voltage from the power supply unit 10 and applied to the grid electrode 64 of each tube 61 in said discriminating unit circuits, is such as to normally bias said tubes to cutoff.

In addition, assume that a dispensing mechanism A is also placed in operative association with each discriminating unit circuit 7 and 8 in the same manner as is shown with the circuit 6 in Fig. 1.

With the above described circuit parameters established the oscillator unit 4 is thence normally operative to generate a continuous signal having an initial frequency of F_0 , which, as above mentioned, is higher than each of the frequencies selected for the discriminating unit circuits 6-8; therefore, said signal is not effective to cause the operation of the latter.

When it is desirable to dispense an article from the mechanism A associated with the discriminating unit circuit 6, a token or coin (hereinafter defined as the first

token) is placed into the slot 20 of the core 19 for the oscillator coil 17 and permitted to fall therethrough. As a result, the frequency of the oscillator signal is momentarily lowered to the frequency F_1 , and since the condenser 42, is attuned to the frequency F_1 , the changed oscillator signal is applied to the primary winding 47 of the transformer 48 in the discriminating unit circuit 6. With the primary and secondary winding of said transformer also being attuned to the frequency F_1 , said signal is then applied to the control grid electrode 64 of the tube 61 of said unit circuit through the conductor 67. As a result, the voltage on said grid electrode is raised above its cut-off valve sufficiently to cause said tube to conduct and provide a current flow in its plate circuit effective to energize the relay coil 75 of the relay 76 and cause the actuation of the movable contact 104 such that it engages with its companion stationary contact 103. When this occurs, one end of the coil 112 of the solenoid actuating apparatus, for the dispensing mechanism A associated with the aforesaid discriminating unit circuit 6, is connected to the line conductor L_3 by means of conductor 105, contacts 102—104 of relay 87, conductor 106 and contacts 102—104 of relay 96, and the opposite end of said coil is connected to the line conductor L_4 by means of conductor 113. The coil 112 of said apparatus is energized thereby such that the dispensing lever 80 of the actuating apparatus is rocked clockwise as viewed in Figs. 1 and 2 to its dot-dash position as is indicated in the latter figure, such that the article D_1 , supported in the article container 171 is permitted to fall to the chute 187 and thence slide downwardly thereon to the opening 188 whereat it may be easily removed. And, as said lever is rocked clockwise the aforementioned finger 179 on the same extends into the container 171 beneath the article next above article D_1 as is designated by the reference D_2 to prevent the same from also falling with the dispensed article.

When the driving part of the lever 80 reaches its uppermost clockwise position as indicated in Fig. 2, it engages with the switch 79 to open the normally closed contact 78. As a result, the B+ plate voltage is disconnected from the oscillator and discriminating unit tubes 13 and 61 respectively and the same are rendered non-conductive. The relay coil 75 therefore is de-energized which, in turn, effects to disconnect the solenoid coil 112 from the line conductors L_3 — L_4 . The dispensing lever 80 hence is free to fall to its rest or non-actuated position such that its driving part 176 again engages with the abutment 184 thus completing one article dispensing cycle. When the token falls through the care of the oscillator coil 17 it is caught within the aforementioned container 21b, and the oscillator unit 4 is again conditioned to generate a signal whose frequency is F_0 .

To dispense an article from the apparatus operated by the discriminating unit circuit 7, a token or coin (defined above as the second token) is placed into the core 19 of said oscillator coil, and permitted to fall therethrough in the same manner as previously described. As a result the oscillator signal is changed such that its frequency is lowered to that designated as F_2 . When this occurs, the condenser 43 and transformer 53 in the discriminating unit circuit 6 pass this signal and apply the same to the control grid electrode 64 of the tube 61 in said circuit. Said tube then conducts to effect the energization of the relay coil 86 and the solenoid coil 112 of the dispensing apparatus, to thereby cause the said apparatus to dispense an article from the mechanism associated with the aforesaid discriminating unit circuit 7 in the same manner as previously described. It is also noted that as the signal of the oscillator is lowered to the frequency F_2 , it passes through the aforesaid frequency F_1 . Hence, the tube 61 in the circuit 6 may also tend to conduct, but before it effects the actuation of the solenoid coil associated therewith the circuit 7 effects the operation of the relay 87. As a result, the contact 104

of said relay is moved from engagement with its stationary contact 102 to disconnect the line conductor L_3 from the contact 104 of the relay 76. Therefore, the solenoid coil 112 of the circuit 6 is prevented from being energized, and hence only the dispensing mechanism associated with the circuit 7 is actuated to dispense an article corresponding to said second token or coin.

It is now also apparent that when the discriminating unit circuit 8 is made conductive as a result of the token or coin (hereinafter referred to as the third token) being placed into and allowed to fall through the core of the oscillator coil 17, the dispensing mechanism associated therewith is effective to dispense an article corresponding to said token, while the actuation of the relay 96 of said circuit disconnects the line conductor L_3 from the relay contacts in each of the circuits 6 and 7 and thus prevents the operation of the respective dispensing mechanism associated therewith.

Having thus described a preferred embodiment of signal generating device of the present invention it is realized by one skilled in the art to which it pertains that the same is susceptible to various forms and combination of elements without departing from the inventive concepts contained herein, and as defined in the claims.

What is claimed is:

1. In an article dispensing machine having container means for holding a plurality of articles and means for dispensing said articles from said container means, actuating means for automatically causing the operation of said dispensing means, comprising an oscillator having an electronic tube with an anode, grid and cathode electrodes, impedance means in circuit with said electrodes and operable therewith to generate an electrical signal having a predetermined initial frequency, a plurality of electro responsive means operatively connected to said dispensing means and adapted to cause the actuation of the same, separate impedance means for each of said electro responsive means being tuned to a preselected frequency different from any other frequency and said initial frequency and operable in said tuned condition to connect said electro responsive means in signal receiving relation with said oscillator, and means in said first named impedance means conditioned by the introduction of metal means into inductive relation therewith and having characteristics operative to change the frequency of said electrical signal to the preselected frequency of at least one of said separate impedance means effective to cause the operation of the electro responsive means connected therewith and of said article dispensing means.

2. In an article dispensing machine having container means for holding a plurality of different kinds of articles and dispensing means for separately dispensing each kind of article, actuating means for causing the selective operation of said dispensing means comprising an oscillator having an electronic tube with an anode, grid and cathode electrodes, impedance means in circuit with said electrodes and effective therewith to generate an electrical signal having a predetermined initial frequency, a plurality of electro responsive means each having an electronic tube separately operatively connected in circuit with said dispensing means and actuatable to cause the operation of the latter and effect the dispensing of a particular one of said different kinds of articles, separate impedance means operatively connected with each of said electronic tubes in said electro responsive means and to the electronic tube in said oscillator and tuned to a preselected frequency different from any other frequency and said initial frequency, and inductance means in said first named impedance means conditioned by metal means having predetermined characteristics being introduced into inductive relation therewith and operative to change the frequency of said electrical signal to the preselected frequency of one of said separate impedance means effective to cause the operation of the electronic tube con-

nected to the latter and said dispensing means in circuit therewith.

3. In an article dispensing machine having container means for holding a plurality of different kinds of articles and dispensing means for separately dispensing each kind of article, actuating means for causing the selective operation of said dispensing means, comprising an oscillator having an electronic tube with an anode, grid and cathode electrodes, impedance means including an inductance in circuit with said grid and cathode electrodes and effective therewith to generate an electrical signal having a predetermined initial frequency, a plurality of electro responsive means each having an electronic tube separately operatively connected in circuit with said dispensing means and actuatable to cause the operation of the latter and effect the dispensing of a particular one of said different kinds of articles, separate impedance means including a variable inductance operatively connected with each of said electronic tubes in said electro responsive means and in a signal receiving relation with said oscillator and tuned to a preselected frequency different from any other frequency and said initial frequency, said first named inductance being conditioned by metal means having predetermined characteristics placed into inductive relation therewith and operative to change the frequency of said electrical signal to the frequency of a preselected one of said variable inductances effective to cause the actuation of the electronic tube connected to the latter and said dispensing means in circuit therewith.

4. In an article dispensing machine as defined in claim 3 and wherein means in circuit with said electro responsive means are actuatable in response to the operation of the dispensing means to return said electro responsive means to a non-conductive condition.

5. In an article dispensing machine having a plurality of container means each being adapted to hold a predetermined one of a plurality of articles and dispensing means operatively connected to each of said container means for separately dispensing said articles, actuating means for automatically causing the selective operation of said dispensing means, comprising an oscillator having an electronic tube with an anode, grid and cathode electrodes, impedance means including an inductance in circuit with said electrodes and effective therewith to generate an electrical signal having a predetermined initial frequency, a plurality of electro responsive means each including an electronic tube normally in a non-conductive condition and separately operatively connected to one of said dispensing means, a plurality of impedance means each including a variable inductance operatively connected in an energizing relation with one of said electronic tubes in said electro responsive means and in a signal receiving relation with said oscillator, each of said variable inductances being tuned to a preselected frequency different from any other frequency and said initial frequency, and said first named inductance being conditionable by metal means having characteristics identifiably representative of a preselected one of said articles being placed into inductive relation therewith to change the frequency of said electrical signal to the frequency of a predetermined one of said variable inductances, said electrical signal being effective at said latter frequency to cause the electronic tube connected with said predetermined one of said variable inductances to conduct and thereby actuate the dispensing means corresponding to said preselected one of said articles.

6. In actuating means for an article dispensing machine as defined in claim 5 and wherein the plurality of impedance means each includes a variable inductance and capacitance operatively connected in an energizing relation with one of said electronic tubes in said electro responsive means and in a signal receiving relation with said oscillator, said variable inductance and capacitance each being tuned to a preselected frequency different from any other frequency and said initial frequency.

7. In actuating means for an article dispensing machine as defined in claim 6 and wherein the variable inductance and capacitance in each of said plurality of impedance means are connected in series with each other and in an energizing relation with one of said electronic tubes in said electro responsive means.

8. In actuating means for an article dispensing machine as defined in claim 5 and wherein means connected in circuit with said electro responsive means are responsive to the actuation of the article dispensing means to return the electronic tubes in said electro responsive means to a non-conductive condition.

9. In an article dispensing machine having a plurality of container means each being adapted to hold a predetermined one of a plurality of articles and dispensing means operatively connected to each of said container means for separately dispensing said articles, actuating means for automatically causing the selective operation of said dispensing means, comprising an oscillator having an electronic tube with an anode, grid and cathode electrodes, impedance means including an inductance in circuit with said electrodes and effective therewith to generate an electrical signal having a predetermined initial frequency, a plurality of electro responsive means each including an electronic tube normally in a non-conductive condition and having an anode, grid and cathode electrodes, means connecting the anode electrode of each of said last named tubes to a preselected one of said dispensing means, a plurality of impedance means each including a variable inductance operatively connected in an energizing relation with the grid of one of said last named electronic tubes and in a signal receiving relation with said oscillator, each of said variable inductances being tuned to a preselected frequency different from any other frequency and said initial frequency, and said first named inductance being conditionable by metal means having characteristics identifiably representative of a preselected one of said articles being placed into inductive relation therewith to change the frequency of said electrical signal to the frequency of a predetermined one of said variable inductances, said electrical signal being effective at said latter frequency to cause the electronic tube connected with said predetermined one of said variable inductances to conduct and thereby actuate the dispensing means corresponding to said preselected one of said articles.

10. In actuating means for an article dispensing machine as defined in claim 9 and wherein the variable inductance in each of said plurality of impedance means is connected in series circuit between the grid of one of the electronic tubes in the electro responsive means and the electronic tube of said oscillator.

11. In actuating means for an article dispensing machine as defined in claim 9 and wherein each of said plurality of impedance means includes a variable inductance and capacitance connected in series circuit with each other and between the grid of one of the electronic tubes in the electro responsive means and the electronic tube of said oscillator.

12. In actuating means for an article dispensing machine as defined in claim 11 and wherein each of said variable capacitances is connected to each other and in a signal receiving relation with the grid electrode of the electronic tube of said oscillator.

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