Nov. 21, 1950 W. E. SNELL ET AL 2,531,236

TOKEN-ACTUATED MECHANISM

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Fig. 1,

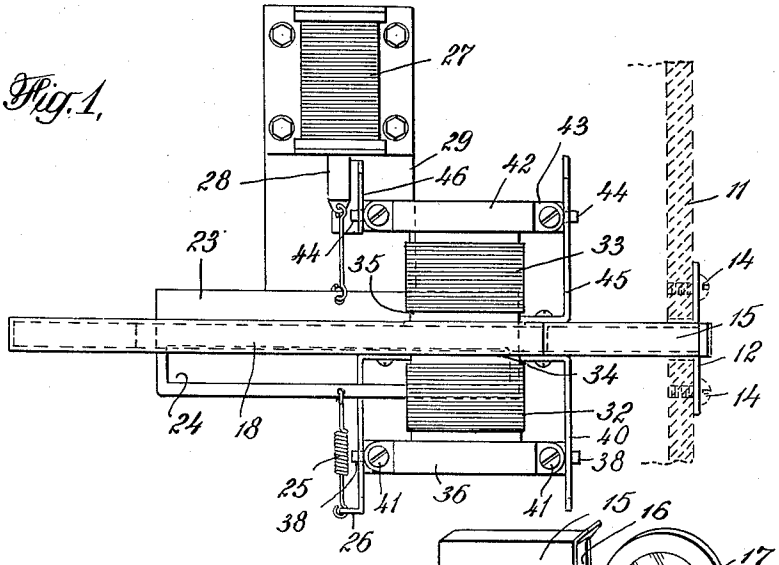
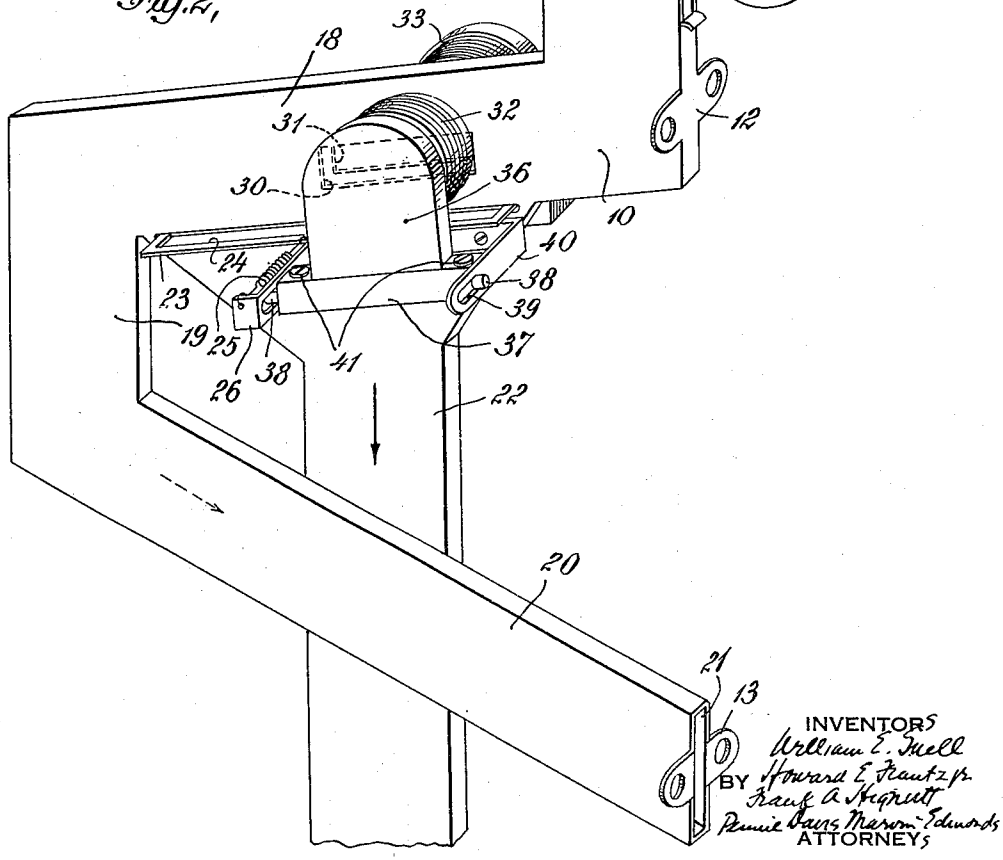


Fig. 2,



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Fig. 3,

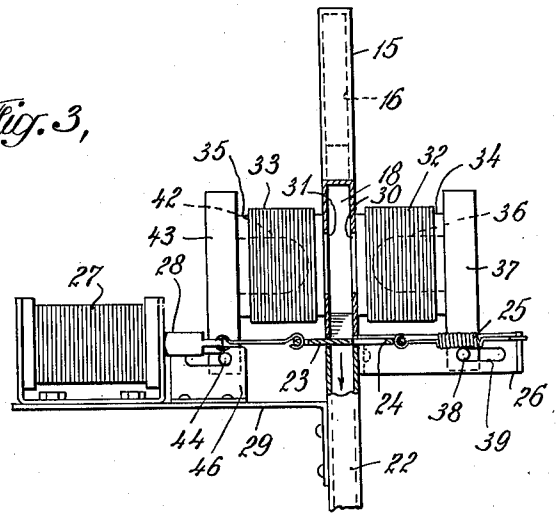
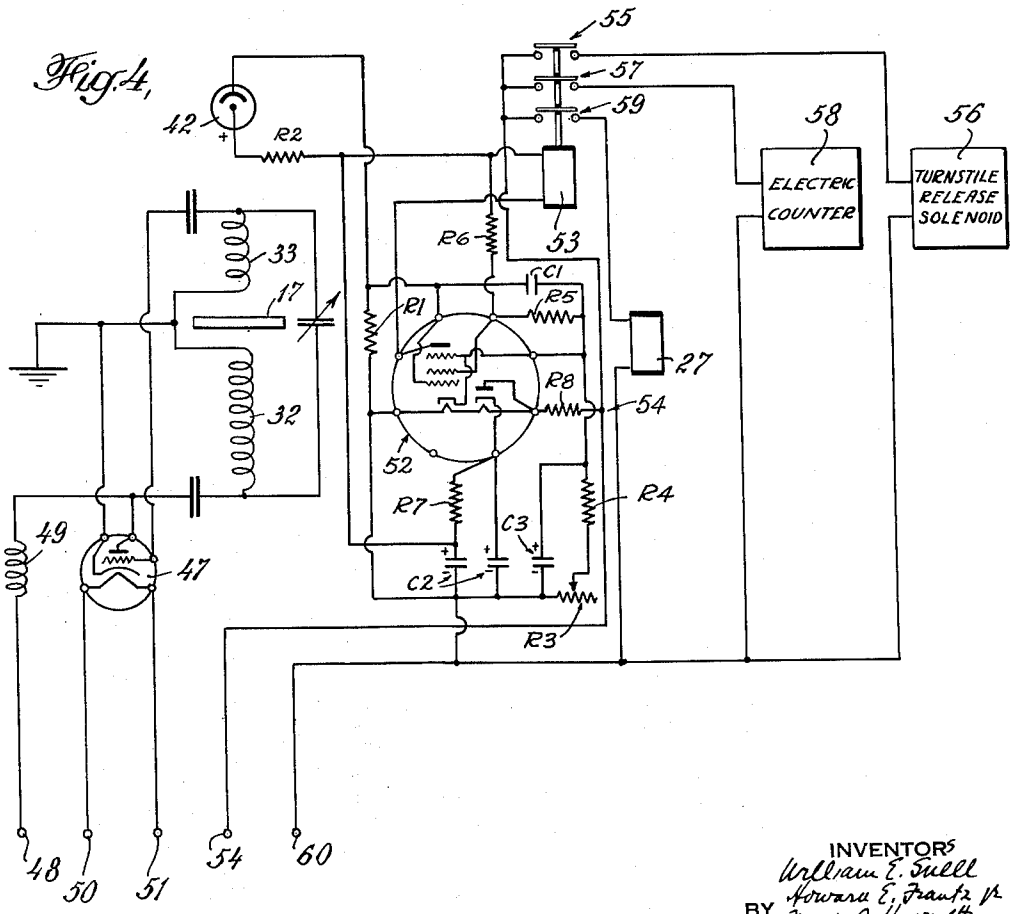


Fig. 4,



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UNITED STATES PATENT OFFICE

2,531,236

TOKEN-ACTUATED MECHANISM

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Application September 22, 1944, Serial No. 555,254

8 Claims. (Cl. 194—4)

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This invention relates to apparatus actuated by tokens, such as machines for vending merchandise, or selling tickets, turnstiles, etc. More particularly, the invention is concerned with a novel token-actuated mechanism for controlling the operation of one or more machines, which functions, upon receiving a genuine token, to cause such machines to operate and does not respond to counterfeit tokens, so that the machines remain idle. The new mechanism may be employed for controlling machines in various combinations and a typical application of the mechanism for controlling a turnstile and a counting device will be illustrated and described in detail for purposes of explanation. It will be apparent, however, that the utility of the new mechanism is not limited to that particular use.

The mechanism of the invention is intended to be operated by tokens which can be activated by appropriate means so that they give off light. Such a token may be a body of suitable material having a fluorescent coating which can be caused to glow when exposed to ultra-violet light. Another token that is suitable comprises a hollow body containing a quantity of one of the noble gases which can be caused to emit light by the action of a high frequency field, and such a token is described and claimed in our co-pending application Serial No. 545,852, filed July 20, 1944, which issued November 12, 1946, as Patent No. 2,410,845. Certain details of the new control mechanism will vary in accordance with the type of token to be employed but, since the necessary changes for the purpose are simple and will be readily understood, a form of the mechanism suitable for use with the token of our copending application is illustrated in the accompanying drawings.

The new control mechanism comprises a passage into which a token may be inserted, the token traveling through the passage by gravity. At one point in its travel, the token is acted on by means which are effective to cause a genuine token to emit light, and the light so emitted falls upon a photocell and causes the latter to develop energy. The current flow from the photocell is then amplified and the amplified current actuates a relay in a power line. The line supplies energy to means for causing the token to be discharged from the passage and also to any other

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machine that it may be desired to operate. For example, in a turnstile installation, the line may supply energy, when the relay is closed, to a release mechanism for the turnstile and a counting device. Accordingly, when a genuine token is introduced into the passage, it is activated and gives off light as it moves through the passage. The light so emitted causes a flow of current in the photocell circuit and the amplified current closes the relay so that the token discharge means, the turnstile release mechanism, and the counting device are all actuated. If a counterfeit token is inserted into the passage, it is not activated and no current flows through the photocell circuit. The turnstile then remains locked, the counting device does not register, and the discharge mechanism remains idle, so that the token continues to the end of the passage where it is returned to the person who inserted it.

For a better understanding of the invention, reference may be had to the accompanying drawings, in which

Fig. 1 is a plan view of the mechanism;

Fig. 2 is a view of the mechanism in perspective;

Fig. 3 is an end view of the mechanism with parts broken away; and

Fig. 4 is a wiring diagram of the apparatus.

The new control mechanism comprises a passage 10 which is made up of a plurality of sections and may have its opposite ends disposed substantially in the same vertical plane. The mechanism is ordinarily mounted within a cabinet and may be supported by having the ends of the passage attached to the front wall 11 of the cabinet. For this purpose, both ends of the passage may pass through openings in the wall 11 and be secured in place by brackets 12, 13 which may be attached to the cabinet wall by screws 14. The upper end section 15 of the passage extends vertically and has an opening 16 into which a token 17 may be inserted. The token then drops downward through the section 15 to enter an inclined section 18, through which the token rolls. At its lower end, the section 18 is connected by a vertical section 19 to an inclined section 20 leading to the wall of the cabinet, the lower end 21 of section 20 being open and terminating flush with the outer face of the cabinet wall.

The lower side of section 18 of the passage is

connected to a vertical passage 22 which leads downwardly to a suitable receptacle within the cabinet. Communication between section 18 and passage 22 is controlled by a slide 23 which has a longitudinal opening 24 and is movable through aligned openings in the walls of the section. The slide is normally held in position to close the lower side of section 18 by a spring 25 attached at one end to the slide and at the other end to a bracket 26 secured to a side wall of passage 22. The slide 23 may be moved to bring its opening in alignment with the lower side of section 18 by means of a solenoid 27 having a plunger 28 attached to the slide. The solenoid may be supported in any convenient manner as, for example on a bracket 29 attached to the side wall of passage 22.

The side walls of section 18 are formed with aligned openings 30, 31 near the upper end of the section, and a pair of high frequency coils 32, 33 are mounted in alignment with the openings on opposite sides of the passage. The coils are wound on forms 34, 35 respectively, and a photocell is mounted in alignment with each coil and with its sensitive element lying within the coil form. The photocell 36 associated with the coil 32 is provided with terminals receivable in sockets in a base 37 which is held in place by pins 38, one of which extends through an opening 39 in a bracket 40 attached to the side wall of passage 22. The other pin 38 passes through an opening in bracket 26, and by moving the socket outwardly relatively to the brackets, the sensitive element of the photocell 36 may be removed from within the coil form 34, so that the photocell can be freed from the socket. The base 37 is provided with terminal screws 41 through which connections to its socket terminals may be made. Photocell or phototube 42 is mounted on a base 43 at the end of coil 33 and similar to base 37. Base 43 is supported on pins 44, one of which extends through an opening in bracket 45 attached to the side wall of passage section 22. The other pin 44 extends through an opening in a bracket 46 attached to bracket 29.

In the simplified wiring diagram of Fig. 4, the high frequency coils 32, 33 are illustrated with the token 17 lying between them in position to be activated thereby. Current is supplied to the coils by an oscillator tube 47, the plate of which is supplied from a source of direct current 48 at a voltage, for example, of from 90 to 135 volts. A radio frequency choke coil 49 is placed in the plate circuit to keep radio frequency currents out of the power circuits. The filament of tube 47 is heated by a suitable source of electric current, indicated by terminals 50, 51.

In operation, with no light on the phototube 42, there will be no current and thus no potential across R1. Hence, the grid of the amplifier tube 52 will be at the negative bus potential. Resistor R3 is adjusted to produce a cathode bias such that insufficient current for operation will flow thru the relay coil 53.

When a genuine token, in passing through passage section 18, enters the space between coils 32, 33, the token is caused to emit light, and the light is picked up by photocell 42. This light causes electron flow through the phototube 42 and resistor R1 will raise the potential of the amplifier grid, permitting sufficient current to flow to operate relay 53. The setting of R3 and the cathode bias determines the phototube current and the voltage drop across R1 necessary to raise the amplifier grid potential sufficiently to cause relay operation.

The duplex type 117P7 (or 117N7) tube is shown for tube 52. This tube is a combination rectifier and pentode with a cathode heater for operation directly from an A. C. line of approximately 117 volts (terminal 54).

The electrodes on the right side of tube 52 comprises a half-wave rectifier. Resistor R8 is a small protective resistor in the plate lead. R7 and the two capacitors C2 form a Pi filter to supply direct current to the amplifier side.

Resistors R3, R4, R5 and R6 with capacitor C3 paralleling R3 and R4 combine to form a voltage divider circuit to furnish proper cathode and screen potentials and also variable grid bias potential.

From the cathode on the left side of tube 52, and thru the controlling grids and screens to its corresponding plate, a circuit is set up to the associated coil 53 of the relay. These form the amplifier and relay circuit.

Resistor R2 connected in series with phototube 42 and the control grid and cathode of tube 52 form the control circuit.

Series resistor R1 is a contributing factor needed to control the grid of tube 52 in conjunction with variable resistor 53.

The phototube protective resistor R2 protects the phototube against overcurrent drawn via the amplifier cathode-grid circuit in the case of an extreme amount of light on the phototube. Capacitor C1 protects against very short transient light or electrical surges that might cause false operation or chattering of the relay.

The closing of the top set of contacts, designated 55, of relay 53, connects the power source 54 to the turnstile 56, and the current operates a solenoid which releases a locking dog and permits the turnstile to be entered by the depositor of the token. On closing of the second set of contacts 57, current is supplied to accounting device 58 which registers the admission. The closing of the bottom set of contacts 59 energizes solenoid 27 which moves the slide 23. The turnstile solenoid, the counting device, and solenoid 27 are all connected to the common or neutral wire 60.

With the apparatus described, when a genuine token is introduced into the passage 15, the glow which it is caused to emit by the high frequency field through which it passes results in the turnstile being released, the counting device actuated, and slide 23 moved so that the token will be diverted from passage 15 and enter passage 22. The person who deposits may then pass through the turnstile and his admission is registered on the counter. If a counterfeit token is inserted in the slot, it will not emit light on exposure to the high frequency field, and relay 53 will, accordingly, remain open. The turnstile will, therefore, remain locked, no admission will be registered, and slide 23 will remain in position to cut off communication between passage section 18 and passage 22. The token will then continue through passage sections 18, 19, and 20 and be returned to the depositor at the front of the cabinet through opening 21.

In the construction shown in Fig. 1, two photocells are employed so that the mechanism will function even though one photocell becomes inoperative. In the wiring diagram, only one photocell has been shown but the use of the other and the connections therefor will be readily understood. In the event that the apparatus includes only a single photocell and that photocell becomes inoperative, or both photocells become

inoperative in an apparatus equipped with two cells, a token of any kind inserted in passage 15 will not actuate the mechanism and will simply continue through the passage to be returned at the front of the cabinet.

As pointed out above, the mechanism disclosed is intended to be used with a token which can be activated by exposure to a high frequency field and thereby caused to give off light. The particular token for which the mechanism illustrated is intended is that disclosed in our co-pending application and comprises a hollow body containing a noble gas which will glow in a high frequency field. It will be apparent that tokens of other types may be used as, for example, the token may carry a body of fluorescent material which will glow when exposed to ultra-violet light. If the apparatus is used with such a token, the high frequency coils are replaced by means for directing a beam of ultra-violet light upon the token as it passes through passage section 18.

The control mechanism may be employed for the control of various machines other than those described as, for example, the mechanism may control a device for printing and delivering a ticket to be used in pari-mutuel betting. In that application, the control mechanism controls not only the printing device, but also ordinarily controls a totalizer or counting device as well as the means by which a genuine token is retained and a counterfeit token is returned to the depositor.

We claim:

1. A token-actuated mechanism for controlling the operation of a machine, which comprises a passage to be traversed by the token and having a movable wall, means adjacent the passage for activating a token passing through it to cause the token to emit light, a photocell disposed adjacent on opening in a wall of the passage and developing energy as light from the token falls upon it, a source of energy, means for moving the passage wall to discharge the token from the passage, and means actuated by energy from the photocell for connecting the source of energy to the moving means and the machine to cause operation thereof.

2. A token-actuated mechanism for controlling the operation of a machine, which comprises a passage to be traversed by the token and having a movable wall, a high frequency coil adjacent the passage for causing the token moving through the passage to emit light, a photocell adjacent an opening in a wall of the passage and developing energy as light from the token falls upon it, a source of energy, means for moving the movable wall of the passage to discharge the token from the passage, and means actuated by energy from the photocell for connecting the source of energy to the moving means and the machine to cause operation thereof.

3. A token-actuated mechanism for controlling the operation of a machine, which comprises a passage to be traversed by the token and having a movable wall, a high frequency coil adjacent the passage for causing the token traveling through the passage to emit light, a photocell disposed within the coil and developing energy as light emitted by the token falls upon it through an opening in a wall of the passage, a source of energy, means for moving the movable wall of the passage to discharge the token therefrom, and means actuated by energy from the photocell for connecting the source of energy to the moving means and the machine to cause operation thereof.

4. A mechanism for controlling the operation of an energy translating device, the mechanism being operable by a token capable, when activated, of emitting light, which comprises a passage to be traversed by the token, means for activating the token within the passage to cause it to emit light, a source of energy adapted to be connected to said device, means for diverting the token from the passage, and means responsive to the light emitted by the activated token for controlling the flow of energy from the source to said device and for controlling the operation of the diverting means.

5. A token-actuated mechanism for controlling the operation of an energy translating device, which comprises a passage to be traversed by a token, means adjacent the passage for activating a token traversing the passage to cause the token to emit light, a photocell disposed adjacent an opening in a wall of the passage and adapted to develop energy as light from an activated token falls upon it, a source of energy, means for diverting a token from the passage, and means actuated by energy from the photocell for connecting the source of energy to the diverting means and also to the device to cause actuation thereof.

6. A token-actuated mechanism for controlling the operation of an energy translating device, which comprises a passage to be traversed by a token, a high frequency coil adjacent the passage for activating a token traversing the passage to cause the token to emit light, a photocell disposed adjacent an opening in a wall of the passage and adapted to develop energy as light from an activated token falls upon it, a source of energy, means for diverting a token from the passage, and means actuated by energy from the photocell for connecting the source of energy to the diverting means and also to the device to cause actuation thereof.

7. A mechanism for controlling the operation of an energy translating device and operable by tokens capable of being caused to give off light, which comprises a passage adapted to be traversed by a token, means for activating a token traveling through the passage to cause the token to give off light, means for diverting the token from the passage, a source of energy connectable to the diverting means and also to said device, and means responsive to light received from the token for controlling the respective connections between the source of energy and the diverting means and device.

8. A mechanism for controlling the operation of an energy translating device and operable by tokens capable of being caused to give off light, which comprises a passage having an entrance opening at one end into which a token may be inserted and a discharge opening at the other end, the passage also having a diversion opening between its ends, a member movable to open and close the diversion opening, means normally maintaining the member in closing position, means operable to move the member to open the diversion opening, means for activating a token traveling through the passage to cause the token to give off light, a source of energy connectable to the moving means and to the device to cause said means to move the member to open the diversion opening and said device to operate, and means responsive to light given off by the token

for controlling the respective connections between the source of energy and the moving means and device.

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