May 6, 1930. H. B. HIGGINS, JR 1,757,801

CONTROL FOR DISPENSING APPARATUS

Filed Aug. 13, 1928 2 Sheets-Sheet 1

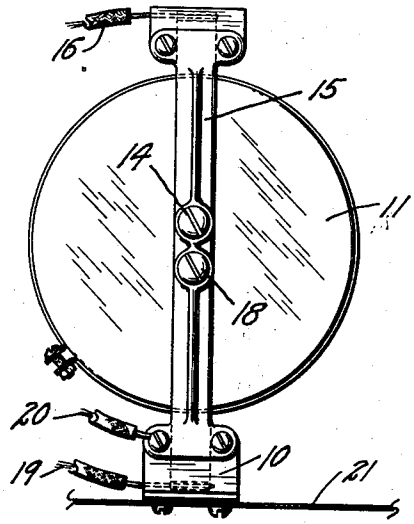


Fig 1

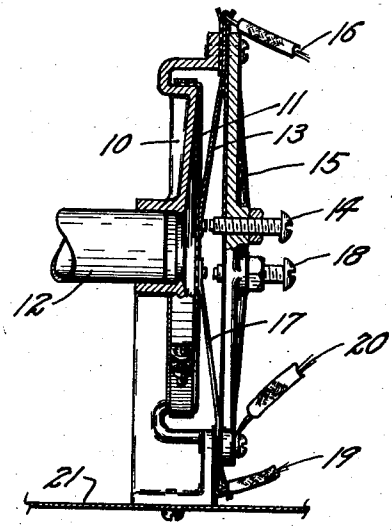


Fig 2

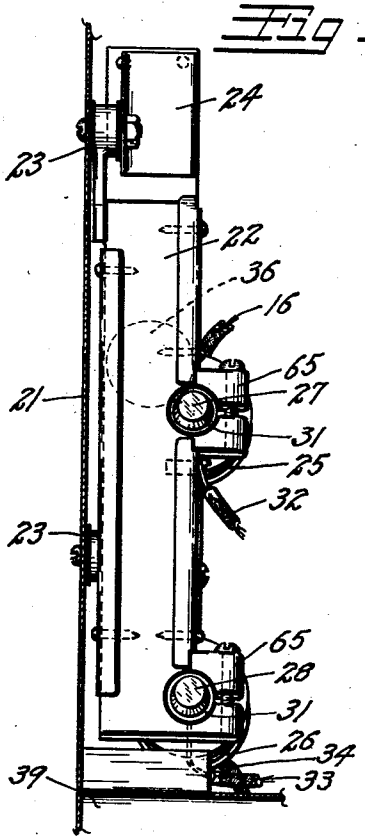


Fig 3

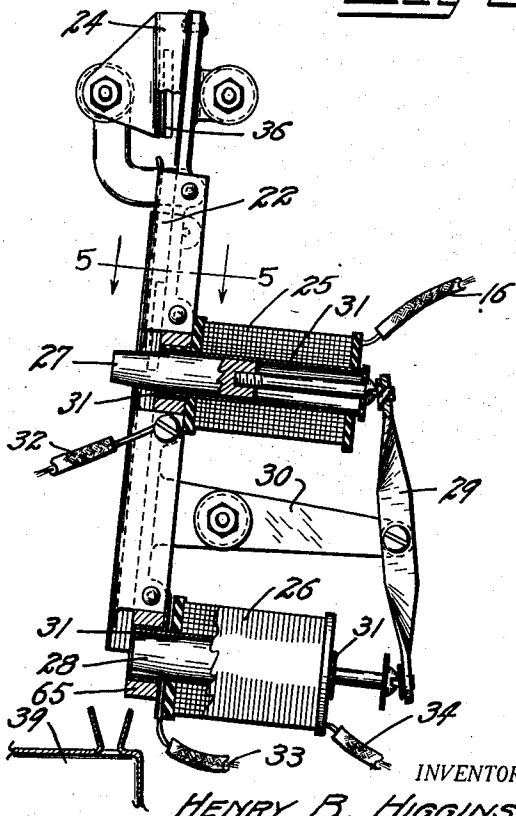


Fig 4

INVENTOR.
HENRY B. HIGGINS, JR.
BY
ATTORNEY.

May 6, 1930. H. B. HIGGINS, JR 1,757,801

CONTROL FOR DISPENSING APPARATUS

Filed Aug. 13, 1928 2 Sheets-Sheet 2

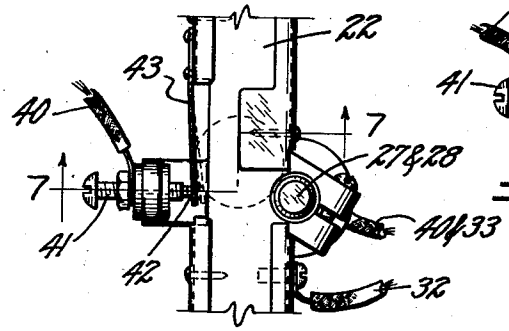


Fig 6

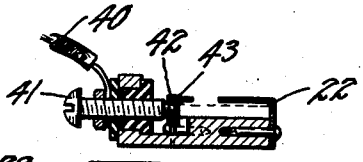


Fig 7

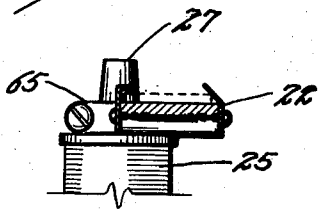


Fig 5

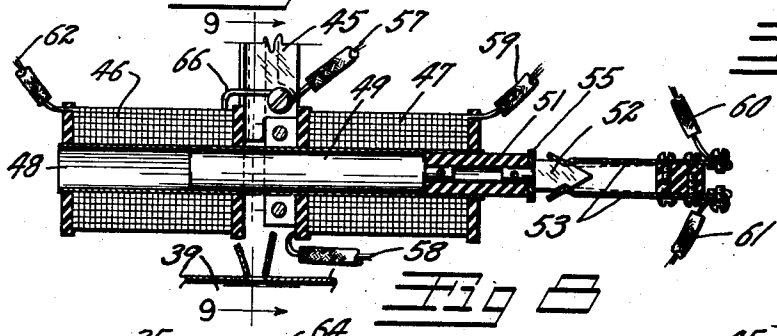


Fig 8

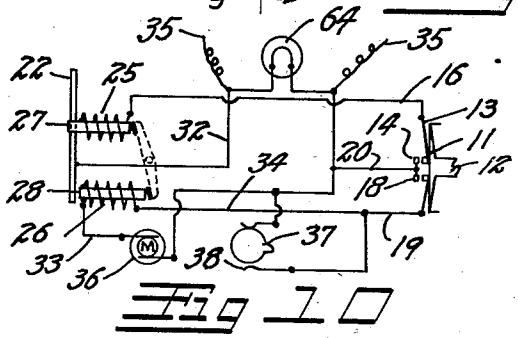


Fig 10

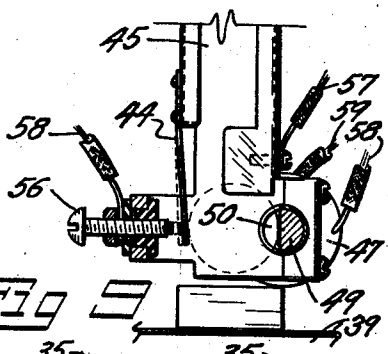


Fig 9

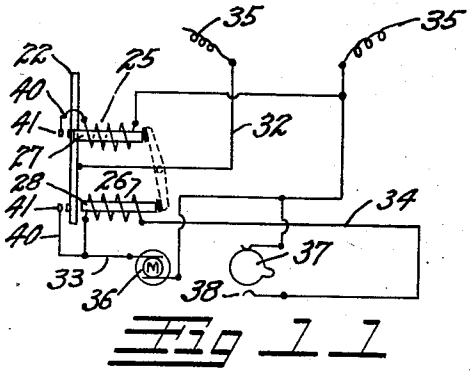


Fig 11

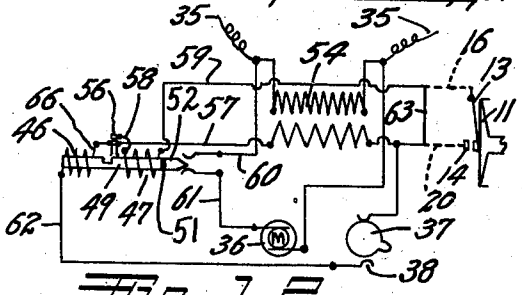


Fig 12

INVENTOR.
HENRY B. HIGGINS, JR.
BY
ATTORNEY.

Patented May 6, 1930 1,757,801

UNITED STATES PATENT OFFICE

HENRY B. HIGGINS, JR., OF DENVER, COLORADO

CONTROL FOR DISPENSING APPARATUS

Application filed August 13, 1928. Serial No. 299,143.

This invention relates to a coin actuated control mechanism for dispensing apparatus, and has for its principal object the provision of an efficient mechanism for closing a motor circuit by the deposit of a coin.

Another object of the invention is to provide automatic electric means for retarding the passage of said coin until it has accomplished its desired control functions, and which will then deposit the coin in a suitable receiver.

A further object is to eliminate all manually operated buttons, levers, handles, etc. from the control circuit.

The invention is particularly designed to be used in connection with an audio circuit closer so that a dispensing machine, after the coin has been deposited, will function only when a certain word is spoken to it. The audio control, however, is not essential to the coin actuated portion of the device, as the latter will function equally well without the audio control or with any other desired circuit closing means. The audio control per se forms no part of the present invention but is fully described and claimed in the applicant's co-pending application Serial No. 299,144 filed Aug. 13, 1928.

In the drawing:

Fig. 1 is a detail view illustrating a front elevation of an audio circuit closing diaphragm such as might be employed for the final closing of the control circuit.

Fig. 2 is a side elevation thereof partially in section.

Fig. 3 is a detail view illustrating a side elevation of one form of chute and coin controlled mechanism employed in the invention.

Fig. 4 is a rear elevation of the mechanism illustrated in Fig. 3, partly broken away to illustrate the internal construction.

Fig. 5 is a detail cross section through the coin chute of Fig. 4, taken on the line 5—5 of that figure.

Fig. 6 is a detail view illustrating an alternate coin chute and method for causing the coin to close a control circuit.

Fig. 7 is a cross section through the coin chute of Fig. 6, taken on the line 7—7, of that figure.

Fig. 8 illustrates a cross section through an alternate arrangement of the coin control magnets.

Fig. 9 is a vertical section through the mechanism of Fig. 8 taken on the line 9—9, of that figure.

Fig. 10 is a circuit diagram illustrating a typical system of electrical connections for the control mechanism of Figs. 1 to 5, inclusive.

Fig. 11 is a circuit diagram illustrating the connection for the apparatus of Figs. 6 and 7. In this diagram, however, the audio control of Figs. 1 and 2 has been eliminated to show the use of the device without an audio control mechanism.

Fig. 12 is a circuit diagram illustrating the connections to the mechanism of Figs. 8 and 9. In this diagram a transformer has been employed so that the control mechanism will employ a relatively low voltage while the motor mechanism will be supplied with high voltage line current.

It is desired to be understood that the wiring diagrams of Figs. 10, 11, and 12 are simply typical indications as to how the coin controlled mechanism illustrated might be placed in circuit in a dispensing apparatus or machine of like nature.

The audio circuit closer of Figs. 1 and 2 comprises a diaphragm frame 10, supporting a flexible diaphragm 11 of thin rubber or like material. A sound tube 12 conveys the audio impulse to the diaphragm 11. A main contact blade 13 is insulated from the apparatus and terminates in a contact button adjacent the center of the diaphragm 11 and opposite a main contact screw 14. The screw 14 is carried in a bridge member 15 which extends entirely across the diaphragm 11. A main diaphragm conductor 16 is soldered to the blade 13.

An auxiliary contact blade 17 extends over the diaphragm and into contact therewith and is arranged to close a contact with a second contact screw 18. The blade 17 is soldered to an auxiliary diaphragm conductor 19. The contact screws 14 and 18 are in circuit with an audio contact conductor 20. A word spoken into the tube 12, will vibrate the

diaphragm 11 causing the main blade 13 to close the circuit with the main screw 14. Should some one attempt to operate the diaphragm by blowing in the tube 12, it will result in closing the circuit between the auxiliary blade 17 and the auxiliary screw 18 which will prevent the operation of the machine as to be later described.

The above audio circuit closer can be employed with the remaining coin controlled circuit closing mechanism to be hereinafter described. It is not essential, however, to the following apparatus, but is simply illustrative of a means which might be incorporated for the final closing of the circuit.

In the drawings, the main frame, and housing for the dispensing apparatus have been eliminated since they are not essential to the invention. The housing has only been indicated at 21 in Fig. 3 as a support for a coin chute 22. The coin chute and its associated mechanism is insulated from the housing 21 by means of suitable insulating washers 23. Above the coin chute a coin receiving funnel 24 is arranged into which the deposited coin falls and by which the coin is directed into the main coin chute 22.

Secured to the coin chute 22 in descending relation are solenoids 25 and 26, wrapped about hollow core sleeves 31 which extend beyond the solenoids and are clamped in insulated bushings in bosses 65 on the coin chute. Reciprocating cores 27 and 28 slide within the core sleeves of the solenoids 25 and 26, respectively. The cores 27 and 28 are caused to move simultaneously in opposite directions by means of a rocking arm 29, carried on a standard 30 from the coin chute 22, and alternately project into the coin passage 22.

Current is fed to the coin chute 22 from a chute conductor 32; to the upper solenoid 25 from the main diaphragm conductor 16, and to the lower solenoid 26 from a lower solenoid conductor 34. The other terminal of the upper solenoid 25 is grounded to the hollow core sleeve 31 of the solenoid so that it is in electrical circuit with the reciprocating core 27. The other terminal of the lower solenoid 26 is grounded to the core sleeve 31 of that solenoid so that it is in electrical circuit with the lower reciprocating core 28. A motor conductor 33 is also connected with core sleeve 31 of the lower solenoid 26.

The operation of the mechanism will be now described with reference to circuit diagram of Fig. 10, in which, the current supply mains are indicated at 35. Let us suppose a coin has been deposited in the coin chute 22. It will come to rest, as indicated in broken line at 36, Fig. 3, upon the core 27 of the upper solenoid. The circuit is now closed from the left main 35 through the chute conductor 32, chute 22, the coin, core 27, solenoid 25, and the main diaphragm conductor 16 to the main diaphragm blade 13. If a word is now spoken into the sound tube 12, the circuit will be completed through the main contact screw 14, the bridge 15 and the audio contact conductor 20, to the other main 35.

The current flowing through the above described closed circuit will energize the solenoid 25 so as to withdraw the core 27 from and project the core 28 into the coin chute. The coin will now fall to the lower core 28 which will prevent its passage from the chute 22. The contact of the coin with the core 28 will cause current to flow from the left main 35 through the chute conductor 32, the chute 22, the coin, the core 28, the motor conductor 33, and to a motor 36. From the motor 36 the current will return to the right-hand main 35 as indicated in Fig. 10. The motor will now start and operate any desired apparatus such as a dispensing apparatus.

A program cam 37 is operated from the motor 36 and designed to close a contact 38 when desired motor operation has been completed. When the contact 38 is closed current will flow from the right-hand main 35 through the contact 38 and the lower solenoid conductor 34 to the lower solenoid 26, thence returning to the left main 35 through the coin, chute 22, and chute conductor 32.

This will energize the lower solenoid so as to withdraw the core 28 and protrude the core 27. The coin will now fall to any suitable coin receiver such as indicated at 39 and open the motor circuit. The motor will now come to rest with the receiving mechanism in position to receive another coin.

Should an unusual impulse enter the tube 12, such as caused by a person blowing in the tube, the contact to the auxiliary screw 18 will be closed and current will flow from the right main 35 through the auxiliary contact conductor 19 to the lower solenoid conductor 34, thus immediately energizing the lower solenoid 26 and dropping the coin to the coin box 39 without operation of the motor 36.

The above described method of having the coin itself carry the current and become a part of the circuit is objectionable especially where high voltage current is employed, since the solenoid cores will become so corroded that a positive contact is not always obtained.

To avoid this, the construction illustrated in Figs. 6 and 7 may be employed. In this construction, the solenoid cores 27 and 28 do not carry current. The core sleeve connections are eliminated and the solenoids all connected through conductors 40 with contact screws 41 carried on, but insulated from, the coin chute 22. The screws 41 make contact with buttons 42 upon contact springs 43 carried by the coin chute. In the latter construction the coin drops between the contact springs and the cores so as to wedge each

spring outwardly to close contact with one of the contact screws 41.

A circuit diagram which could be employed with the device of Figs. 6 and 7, is shown in Fig. 11, in which, current flows from the left main 35 through the chute conductor 32, the coin chute 22, thence through the upper spring 43, upper screw 41, and conductor 40, to the upper solenoid 25 where it acts to withdraw the core 27. This allows the coin to fall against the lower core 28 and force the lower spring 43 outwardly against the lower screw 41 thereby closing the circuit from the coin chute, to the motor 36 and the right-hand main 35. The program cam 37 then acts to close the circuit to the lower solenoid 26 and release the coin so as to break the motor circiut between the lower screw 41 and lower spring 43.

It will be noted that in the latter circuit diagram the audio contact device has been eliminated. Any of the control circuits will operate similarly without the audio-contact mechanism.

Both of the above described forms of the invention employ the full line voltage through all of the solenoids and contacts of the controls. In Figs. 8, 9, and 12, I have illustrated an alternate form of the invention designed for employing a low voltage for the solenoids and contacts and a high voltage for the motor. In this form a coin chute 45 carries a pair of solenoids 46 and 47 upon its opposite faces, and upon a common core tube 48. The core tube passes through the coin passage, it being cut away to allow the edge of the coin to pass through the tube as it passes downwardly in the chute 45.

A magnetic core 49 is arranged to reciprocate between the solenoids 46 and 47, and is provided with a transverse slot 50 which, when in alignment with the coin chute 45, will allow the coin to fall to the coin box 39. On one extremity of the core 49 an insulating bushing 51 is carried, provided with a switch contact 52, which, when the core is at the extreme right-hand position, passes between a pair of switch blades 53 and closes the circuit therebetween.

A transformer 54, indicated in diagram in Fig. 12, supplies current for the operation of the solenoids 46. When the machine is not in operation the core 49 is drawn into the solenoid 46, a stop 55 being provided to limit its movement in this direction.

Assuming a coin has been deposited in the slot 45, it will come to rest against the core 49 and force a switch blade 44 against a contact screw 56. A circuit is then closed from the secondary of the transformer through a conductor 57, coin chute 45, blade 44, screw 56, a conductor 58, solenoid 47, a conductor 59, to the opposite side of the transformer secondary. This will energize the solenoid 47 causing it to draw the core 49 to the right and release the coin through the slot 50 to a coin box.

The contact 52 will now close the circuit between the blades 53 and allow main line current to flow from the left main 35 through a conductor 60, blades 53, and a conductor 61, to the motor 36. The motor will now operate until the program cam 37 closes a circuit from the transformer primary through the contact 38 and a conductor 62 to the solenoid 46, thence returning through a conductor 66 and the conductor 57 to the transformer. This energizes the solenoid 46 and retracts the core 49 to its former position.

The audio control of Figs. 1 and 2 can be inserted in the latter circuit as indicated by the broken conductors 16 and 20, in Fig. 12, by eliminating the bridging wire 63. In Fig. 10 the position of an incandescent lamp is indicated at 64, which may be used to illuminate the machine and apparatus.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what I claim and desire secured by Letters Patent is:—

1. Means for closing a motor circuit by the deposit of a coin comprising: a coin passage; contact means extending into said coin passage and arranged to be contacted with by said coin; a motor control circuit embodying said contact means, said motor control circuit comprising: a first solenoid; a first core for said first solenoid adapted to obstruct the passage of and contact with said coin, said contact means acting to energize said solenoid so as to withdraw said core from said coin; a second solenoid; a second core adapted to obstruct the passage of said coin after it has been released from said first core; a second contact operable by said coin and arranged to energize a circuit to a motor; and a third contact operable by said motor and adapted to energize said second solenoid so as to completely release said coin after a predetermined interval.

2. Means for closing a motor circuit by the deposit of a coin comprising: a coin passage; contact means extending into said coin passage so as to be closed by the passage of said coin; a first solenoid; a first core for said first solenoid adapted to obstruct the passage of said coin, said contact means acting to energize said solenoid so as to withdraw said core from said coin; a second solenoid; a second core adapted to obstruct the passage of said coin after it has been released from said first core; second contacts for said coin; a motor in circuit with said second contacts; and contact means operable by said

motor to energize said second solenoid at a predetermined time.

3. Means for closing a motor circuit by the deposit of a coin comprising: a coin passage; a first solenoid; a first core for said solenoid arranged to project into said coin passage; a second solenoid; a second core for said second solenoid arranged to project into said coin passage; first contacts in said coin passage adjacent said first solenoid; second contacts in said coin passage adjacent said second solenoid, all of said contacts being arranged to be closed by the passage of said coin so that when said coin reaches said first solenoid the latter will be energized to withdraw said first core and allow said coin to fall to said second core; a motor in circuit with said second contacts so that it will operate when said coin reaches said second core; and means for energizing said second solenoid so as to release said coin and open said motor circuit.

4. Means for closing a motor circuit by the deposit of a coin comprising: a coin passage; a first solenoid; a first core for said solenoid arranged to project into said coin passage; a second solenoid; a second core for said second solenoid arranged to project into said coin passage; first contacts in said coin passage adjacent said first solenoid; second contacts in said coin passage adjacent said second solenoid, all of said contacts being arranged to be closed by the passage of said coin so that when said coin reaches said first solenoid the latter will be energized to withdraw said first core and allow said coin to fall to said second core; a motor in circuit with said second contacts so that it will operate when said coin reaches said second core; and means for energizing said second solenoid so as to release said coin and open said motor circuit, said means comprising a contact operable by said motor.

5. Means for closing a motor circuit by the deposit of a coin comprising: a coin passage; a first solenoid; a first core for said solenoid arranged to project into said coin passage; a second solenoid; a second core for said second solenoid arranged to project into said coin passage; first contacts in said coin passage adjacent said first solenoid; second contacts in said coin passage adjacent said second solenoid, all of said contacts being arranged to be closed by the passage of said coin so that when said coin reaches said first solenoid the latter will be energized to withdraw said first core and allow said coin to fall to said second core; a motor in circuit with said second contacts so that it will operate when said coin reaches said second core; and means for energizing said second solenoid so as to release said coin and open said motor circuit; and bridging means between said cores so as to cause them to move simultaneously in opposite directions.

6. A mechanism for closing a motor circuit by the deposit of a coin comprising: a coin chute; a first solenoid; a first core within said solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin; a contact adjacent said first core arranged to be closed by said coin, said contact being in circuit with said solenoid so that said first core will be withdrawn when contacted with by said coin; a second solenoid; a second core for said second solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin below said first core; means for causing said second core to project as said first core is withdrawn; second contact means adjacent said second solenoid, said second contact means being in circuit with a motor and arranged so that when said coin reaches said second core it will close said motor circuit; means operable by said motor to energize said second solenoid at a predetermined time so as to release said coin and project said first core.

7. A mechanism for closing a motor circuit by the deposit of a coin comprising: a coin chute; a first solenoid; a first core within said solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin; a contact adjacent said first core arranged to be closed by said coin, said contact being in circuit with said first solenoid; auxiliary circuit closing means also in circuit with said first solenoid which will act to completely close said first solenoid circuit so as to withdraw said first core; a second solenoid; a second core for said second solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin below said first core; means for causing said second core to project as said first core is withdrawn; second contact means adjacent said second solenoid, said second contact means being in circuit with a motor and arranged so that when said coin reaches said second core it will close said motor circuit; and means operable by said motor to energize said second solenoid at a predetermined time so as to release said coin and project said first core.

8. A mechanism for closing a motor circuit by the deposit of a coin comprising: a coin chute; a first solenoid; a first core within said solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin; a contact adjacent said first core arranged to be closed by said coin, said contact being in circuit with said first solenoid; auxiliary circuit closing means also in circuit with said first solenoid which will act to completely close said first solenoid circuit so as to withdraw said first core; a second solenoid; a second core for said second solenoid arranged to be projected into said coin chute so as to obstruct the passage of said coin below said first core; means for causing said second core to project as said first core is

withdrawn; second contact means adjacent said second solenoid, said second contact means being in circuit with a motor and arranged so that when said coin reaches said second core it will close said motor circuit; and means operable by said motor to energize said second solenoid at a predetermined time so as to release said coin and project said first core, said auxiliary circuit closing means comprising a diaphragm; and contacts operable by said diaphragm so that an audible impulse will close said contacts.

9. Means for closing a circuit by the deposit of a coin comprising: a coin chute; a spring blade arranged to project into said coin chute and be contacted with by said coin; and a contact arranged adjacent said blade so that said coin will close a circuit between said blade and said contact.

10. Means for releasing a coin so as to allow it to close a motor circuit comprising: an auxiliary contact device; a coin channel for containing said coin; a solenoid adjacent said channel; a core operable by said solenoid arranged to obstruct the passage of said coin; a solenoid contact arranged to be closed by said coin when the latter reaches said core, said solenoid, said solenoid contact and said auxiliary contact device being in circuit with each other so that operation of said auxiliary contact device will cause said core to release said coin to said motor circuit thereby opening said solenoid circuit.

11. Coin operated means for controlling a motor circuit comprising: a solenoid; a core operable by said solenoid and arranged to obstruct the passage of said coin; a motor contact adapted to be closed by said coin when the latter reaches said core, said motor contact being in said motor circuit so that closure of the former will cause said motor to operate; and timed contact means operable by said motor in circuit with said solenoid so as to energize said solenoid at a predetermined time and release said coin thereby opening said motor circuit.

In testimony whereof, I affix my signature.

HENRY B. HIGGINS, JR.