

March 13, 1945.

J. PETERSEN

2,371,260

COIN ACTUATED DEVICE

Filed Dec. 18, 1939

6 Sheets-Sheet 1

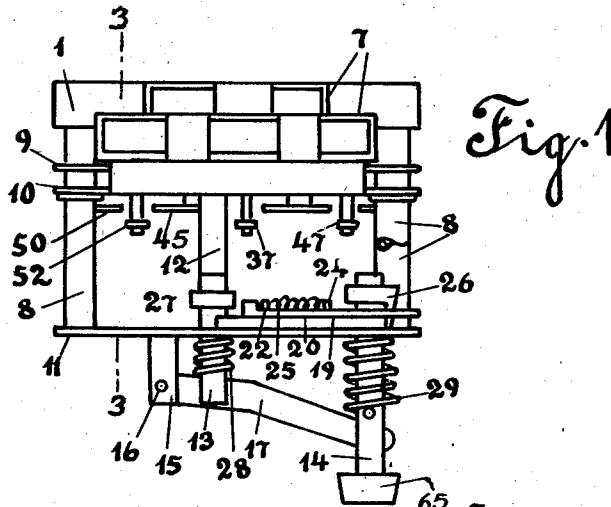


Fig. 2

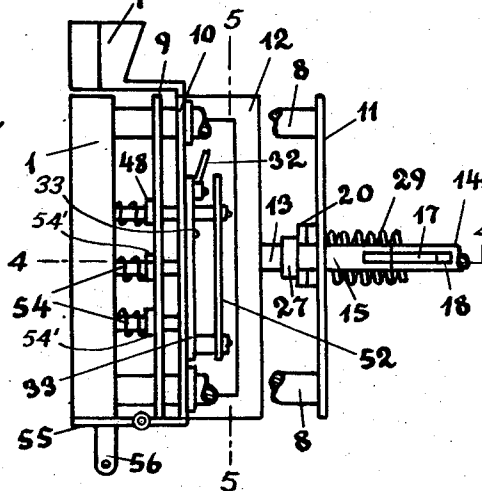
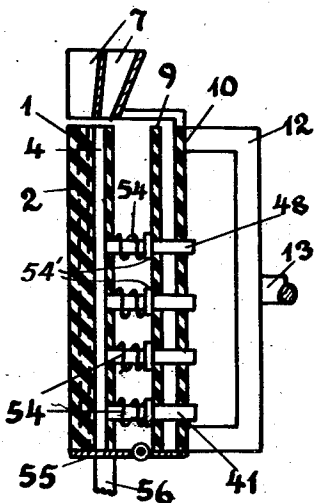


Fig. 3



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6 Sheets-Sheet 2

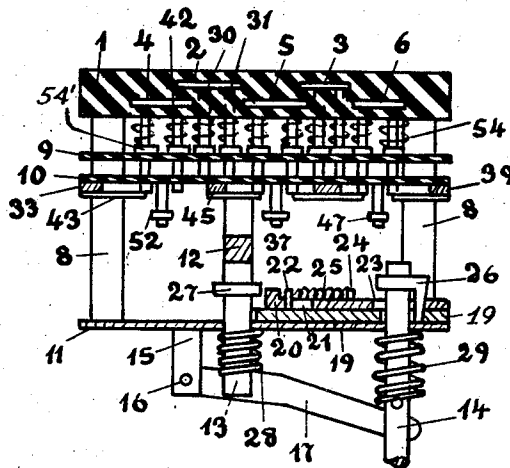


Fig. 4

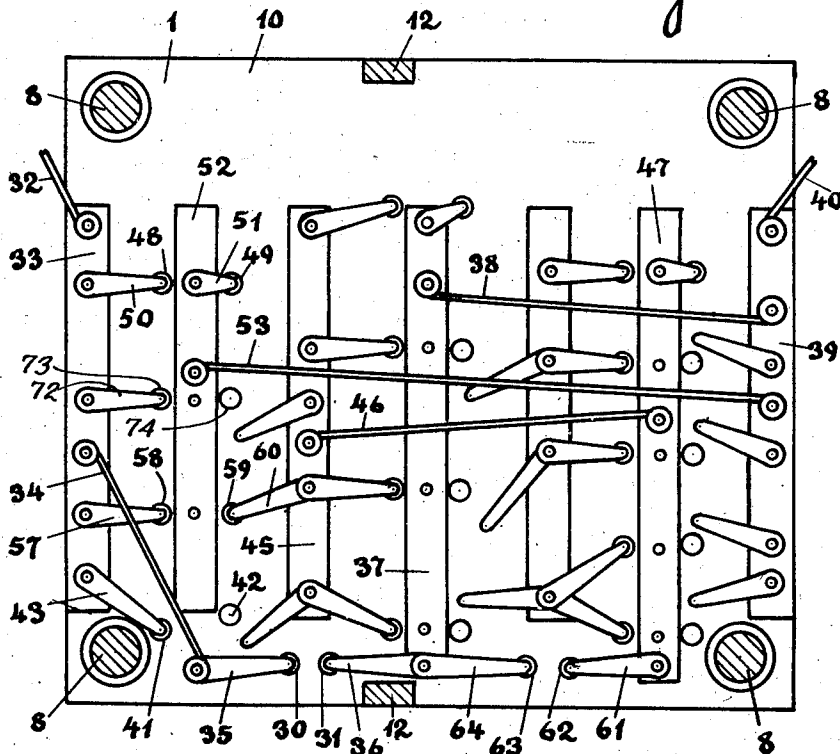


Fig. 5

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6 Sheets-Sheet 3

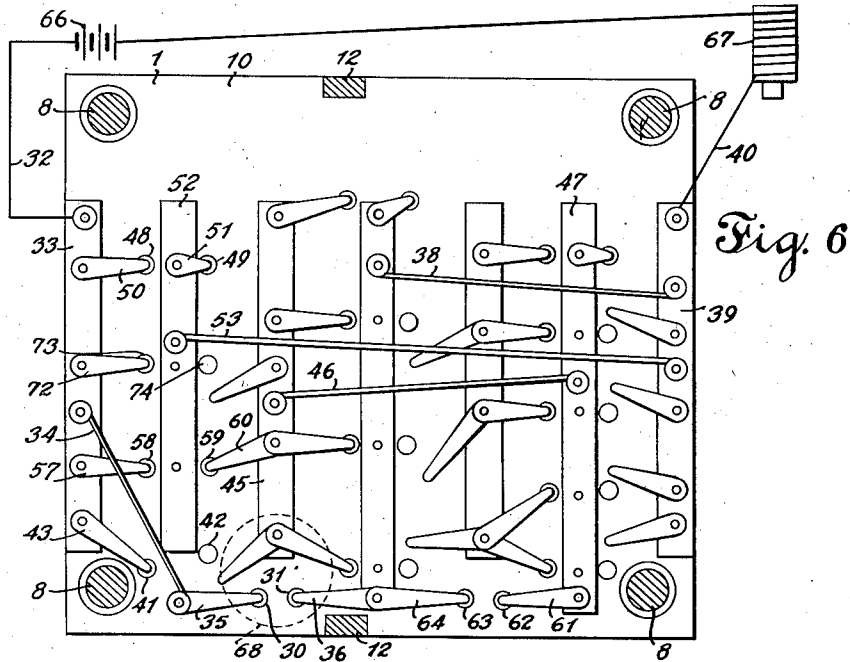


Fig. 6

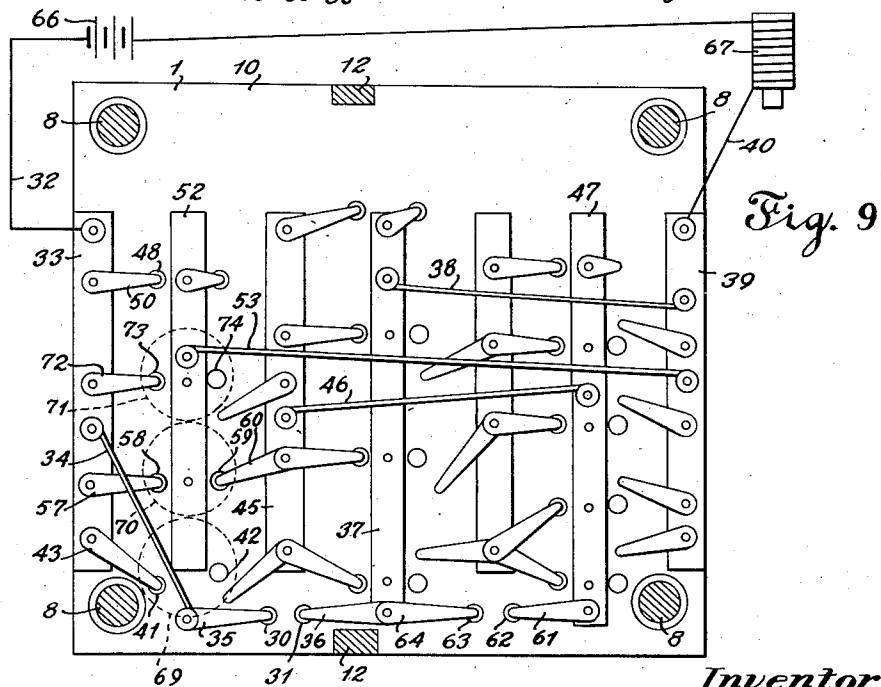


Fig. 9

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6 Sheets-Sheet 4

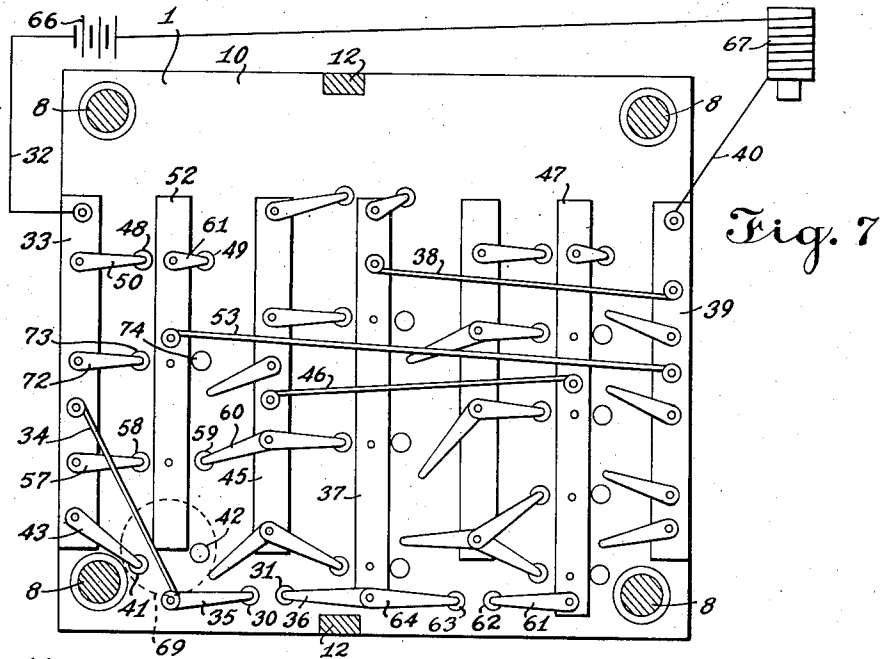


Fig. 7

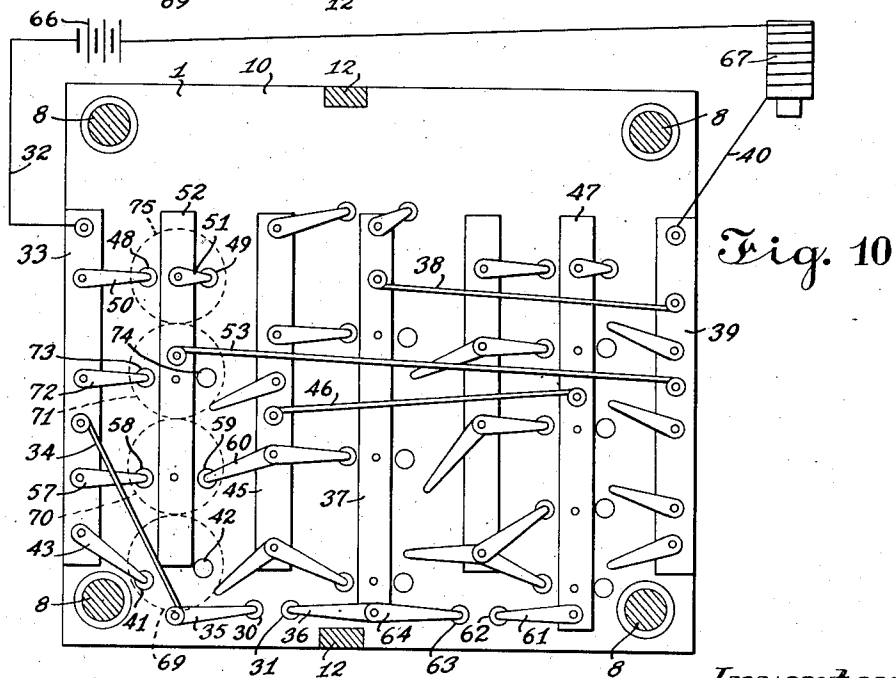


Fig. 10

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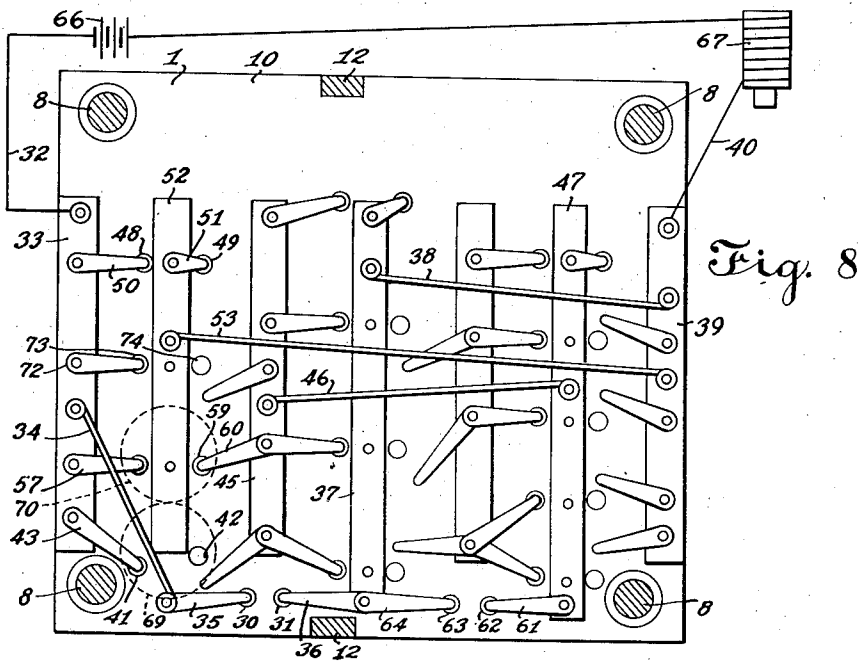
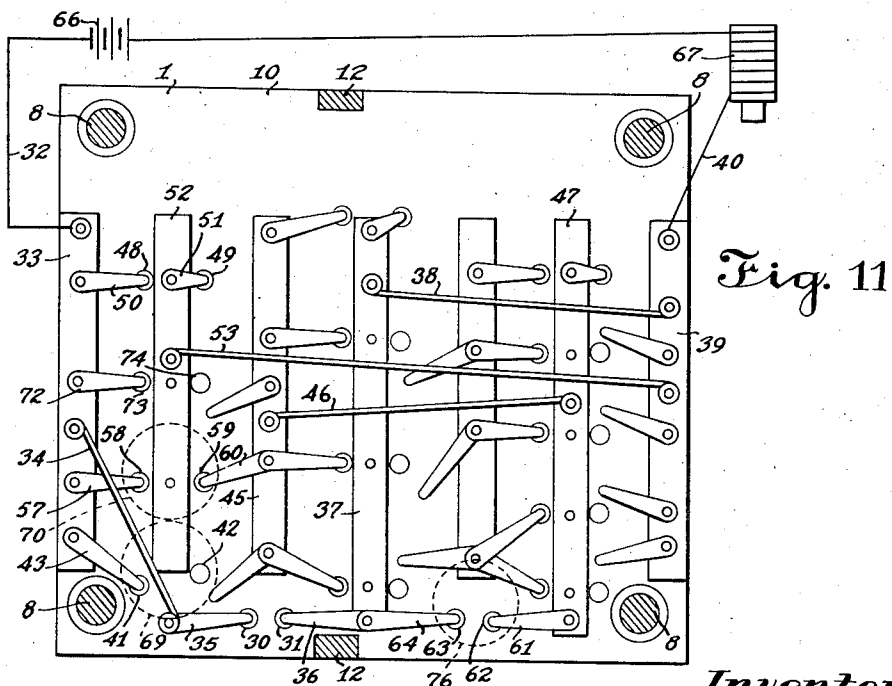
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2,371,260

COIN ACTUATED DEVICE

Filed Dec. 18, 1939

6 Sheets-Sheet 5



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COIN ACTUATED DEVICE

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Fig. 12

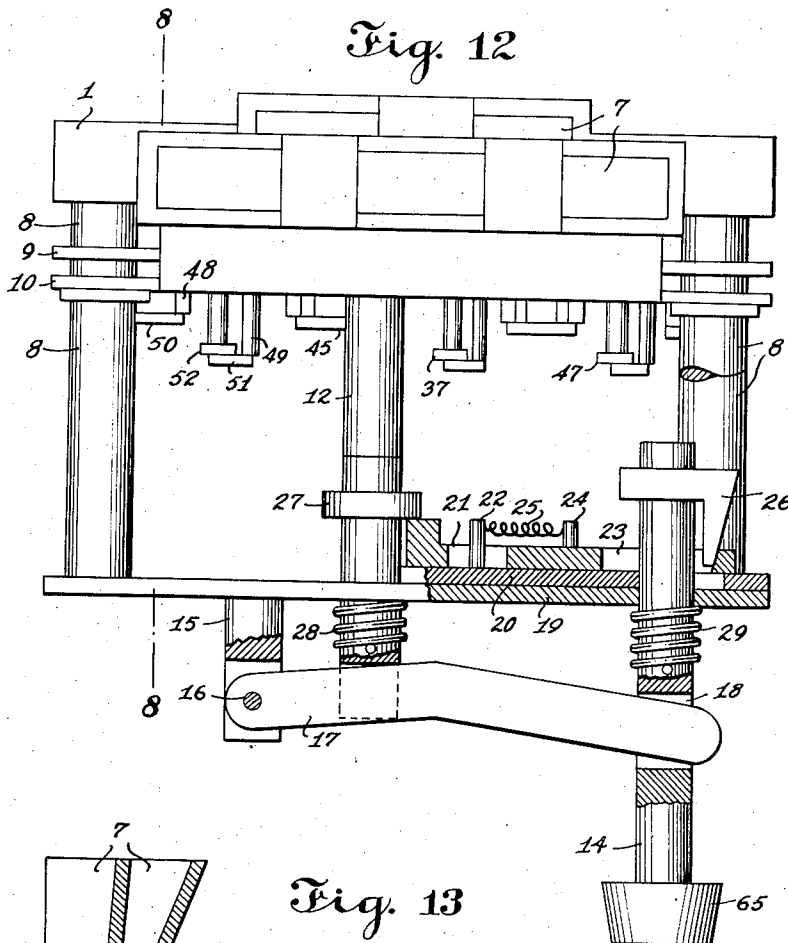
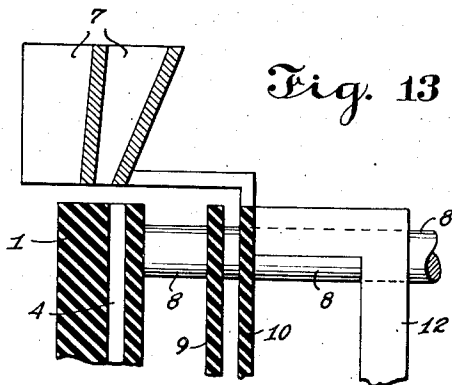


Fig. 13



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UNITED STATES PATENT OFFICE

2,371,260

COIN-ACTUATED DEVICE

Johannes Petersen, Aalborg, Denmark; vested in
the Allen Property Custodian

Application December 18, 1939, Serial No. 309,917
In Denmark January 9, 1939

7 Claims. (Cl. 194-6)

Those coin-actuated or controlled devices of the prior art designed to become operative upon the insertion of a particular coin, are subject to the disadvantage that the prospective user may not have a coin of that particular denomination in his possession. Thus, in the case of a vending machine no goods can be obtained from the vending machine, unless the particular coin for which the machine is made is inserted, nor can such machines be operated by inserting a number of other coins representing the value of the goods in question. This disadvantage has been avoided by the present invention, which relates to a release mechanism for vending machines, in which each coin inserted forms part of an electric circuit, which is not fully closed until the sum of the coins representing the predetermined price of amount has been deposited to condition the machine for operation, whereupon the machine may operate, irrespective of which coins are used.

In these drawings:

Fig. 1 is a plan view of a coin-actuated mechanism according to the present invention.

Fig. 2 is a side view of the mechanism shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on line 3-3 of Fig. 1.

Fig. 4 is a horizontal sectional view taken on line 4-4 of Fig. 2.

Fig. 5 is a vertical sectional view taken on line 5-5 of Fig. 2.

Fig. 6 is a view similar to that of Fig. 5 illustrating a coin in operating position.

Figs. 7, 8, 9 and 10 are views similar to that of Fig. 5 showing, respectively, one, two, three and four coins in position within a slot adapted to receive four coins to effect operation of the device.

Fig. 11 is another view similar to that of Fig. 5 showing two coins of one denomination and a single coin of another denomination in operative position.

Fig. 12 is a view similar to Fig. 1 with some parts shown in section.

Fig. 13 is a fragmentary view partly in section of the coin-receiving hopper.

Referring to the drawings, there is shown a device constructed in accordance with the present invention having a base plate of insulating material 1 (Figs. 1, 3 and 4), in which is formed a number of channels 2, 3, 4, 5 and 6, one for each denomination of coin. These channels or chutes are formed within the plane of the base plate and of widths to correspond with the widths

of the different denominations of coins for which they are designed. Above the base plate 1 is arranged a funnel-shaped part 7 (Figs. 1-3 and 13), provided with hoppers, the lower ends of which are normally in register with the upper open ends of the channels in the base plate 1 for the insertion of coins into said channels. A number of guides 8 are fixed to the outer face of the base plate 1 and extend perpendicularly thereto for supporting a number of parallel auxiliary plates in spaced relation relatively to each other and to the base plate 1. Adjacent the base plate 1, a plate of insulating material 9 is fixed on the guides 8. Next in order a second auxiliary plate of insulating material 10 is mounted on said guides for displacement toward and away from the fixed insulating plate 9. On the outer end of the guides 8 is fixed a third auxiliary plate 11 which serves as a supporting and guide plate for a stem and a plunger soon referred to. This auxiliary guide plate may be constructed of any kind of material, either insulating or conducting material.

A yoke 12, spans the shiftable auxiliary insulating plate 10, the ends of the yoke being secured to the shiftable plate 10 near its diametrically opposite edges, and a stem 13 projects outwardly from a central point of the yoke 12 and through a guide and supporting aperture in the outermost auxiliary guide plate 11 for axial shifting.

A plunger 14 is mounted for movement through the auxiliary guide plate 11 in a direction parallel to the movement of the stem 13. A fulcrum post 15 projecting from the outer face of the auxiliary plate 11 pivotally supports at 16, one end of a lever 17 which extends across the outer end of the stem 13, which is slotted to accommodate the intermediate portion of the lever. The free end of the lever projects through a slot 18 formed longitudinally of the plunger 14.

A reinforcing rib 19 is rigidly fixed on the inner face of the auxiliary guide plate 11 and has slidably mounted thereon a slide 20 provided with a slot 21 through which extends a pin 22 fixedly mounted on rib 19. Slide 20 is also provided with a slot 23 through which the plunger 14 passes.

The stem 13 has a boss 27 fixed thereon engageable by the inner end of the slide 20 for preventing axial outward movement of the stem 13. Slide 20 carries a pin or spring anchor 24 and a spring 25 extends from said pin 24 to the pin 22 fixed on reinforcing rib 19. This spring urges the slide toward the stem 13 to

shift the inner end of said slide into the path of return of the boss 27.

A wedge-shaped key or cam 26 is carried by the inner end of plunger 14 and normally extends into the slot 23 of the slide 20 to retain the slide or bolt withdrawn from the boss 27 on the stem 13. The key 26 is so constructed and mounted on the rod 14 that when said plunger is in its outermost position to which it is urged by the coil spring 29 surrounding said plunger, the slide 20 will be displaced against the action of spring 25 to shift the inner end of said slide 20 out of the path of travel of the boss 27. A coil spring 28 surrounds the stem 13 and urges said stem outwardly to normally shift the boss 27 toward the auxiliary guide plate 11. Both the springs 28 and 29 in urging the stem 13 and the plunger 14 outwardly also serve to displace the lever 17 outwardly. With this construction, when the plunger 14 is pushed inwardly by pressing on the knob 65, the lever 17 is displaced rearwardly to press the stem 13 and its boss 27 inwardly together with its yoke 12, which, in turn, slides the shiftable auxiliary plate 10 along the guide rods 8 towards the insulated auxiliary plate 9 fixed on the guide rods. Upon pressing the plunger 14 inwardly, the key 26 is partly withdrawn out of the slot 23 of the slide or bolt 20 which enables the spring 25 to shift the slide to a position in the return path of the boss 27 to retain the stem 13 and its shiftable auxiliary plate 10 in its rearmost position, as long as the operator holds the knob 65 and plunger 14 in their rearward or inward positions, against the tensions of the springs 29 and 28.

The slots 2, 3, 4, 5 and 6 extending longitudinally within the base plate 1 are of various widths to accommodate coins of various denominations.

Each coin slot is provided with two parallel rows or series of apertures spaced apart from each other vertically by distances substantially equal to the diameters of the coins which the respective coin slots are designed to accommodate. These apertures extend transversely through the outer face of the base plate.

Thus, each coin slot is provided with horizontal pairs of apertures, the respective apertures of each pair being spaced apart a distance somewhat less than the diameter of the coins accepted by their particular slots.

The individual apertures of each pair with relation to their respective coin slots is such that the lowermost pair of apertures lie in line with and are comprised within the circumference of the first coin deposited in its coin slot, the next higher pair of apertures lie within the circumference of the second coin deposited in said slot, and so on, the coins stacking up edgewise in their respective slots, as deposited.

The parallel auxiliary plates 9 and 10 are likewise provided with parallel rows of apertures in alignment with the respective vertical rows of apertures in the base plate 1.

Each aperture in the base plate slidably accommodates the inner end of a contact pin 48, 49, 58, 59, 41, 42, 30, 31, 62, 63, etc. (Fig. 5), said pins each having a shoulder 54' (Fig. 4) formed intermediate its ends. The outer ends of said contact pins beyond the shoulders 54' extend through the corresponding apertures formed in the auxiliary plates 9 and 10. Springs 54 (Figs. 2 and 3) encircling the contact pin and interposed between the outer face of the base plate 1 and the shoulder 54', press said contact pins

outwardly until the shoulders contact the inner face of the stationary auxiliary insulated plate 9, at which time the inner ends of the contact pins have been withdrawn from their respective coin slots, and their outer ends project beyond the outer face of the shiftable insulated auxiliary plate 10.

The insulated auxiliary plate 10 shiftablely supported on the guide rods 8 for movement inwardly by the lever 17 and for return movement by the spring 28, carries on its outer face a series of vertically arranged conductor bars 33, 52, 45, 37, 47 and 39 (Figs. 5-11) spaced apart from each other.

The conductor bars 33, 39 will be referred to as bus bars, because the current from any suitable source 66 (Figs. 6-11), is led to the bus bar 33 conveniently arranged along one vertical edge of the base plate 1, through the lead 32 and is returned to the source by the lead 40 from the bus bar 39 arranged conveniently alongside the opposite vertical edge of the base plate.

The vertical conductor bars 52, 45, 37, 47, etc. are arranged in parallel spaced relation across the outer face of the shiftable auxiliary plate 10 in the space between the two bus bars 33, 39.

The bus bars and the conductor bars each support one or more laterally extending spring contact fingers, the lead-in bus bar 33, for example, having four such fingers 50, 72, 57 and 43 laterally projecting over into contact with the outer ends of the left hand vertical row of contact pins 48, 73, 58 and 41, respectively, associated with the coin chute 4.

Similarly, the conductor bar 52 is provided with the single laterally extending spring contact finger 51, the free end of which lies upon the outer end of the contact pin 49 constituting the uppermost of the right hand vertical row of contact pins associated with the coin slot 4.

The outer ends of the remaining contact pins 74, 59 and 42 in the right hand vertical row of contact pins associated with the coin slot 4 are selectively rendered effective or ineffective depending upon the adjustment of the corresponding spring contact fingers projecting leftward from a second conductor bar 45.

And the adjustment of all spring contact fingers depends upon the value of the article vended, for instance, and the various combinations of coins of the same or various denominations, which will equal the predetermined price of the article.

From the foregoing, therefore, it will be understood that pressure inward upon the knob 65 of the plunger 14 will rock the lever 17 inwardly (counter-clockwise in Figs. 1, 4 and 13) to slide the shiftable insulated auxiliary plate 10 with its conductor bars and spring contact fingers along the guide rods 8 towards the fixed insulated auxiliary plate 9.

As a result, those spring contact fingers which lie over the outer ends of their contact pins, press the contact pins inwardly against the tensions of their restoring springs 54 until the inner ends of the contact pins are arrested by contact with such coins as have been deposited in the coin slot or slots.

If the contact pins are arrested by coins, farther travel of the slidable auxiliary plate 10 merely flexes the corresponding spring contact fingers.

In the absence of coins to arrest the contact pins, the latter merely continue to travel across the empty coin slot, and in those instances where

the contact spring fingers are out of line with their contact pins, the contact pins remain in their normal outward spring-pressed positions.

Contact of the inner ends of a horizontally arranged pair of pins, as 58, 59 with a coin will complete a circuit between the respective pins through the coin, and the effective or ineffective arrangement of the adjustable spring contact fingers relatively to their corresponding contact pins is determined by the predetermined price and the various combinations of coins making up that price.

Thus Figs. 7, 8, 9 and 10 show what may be termed a basic coin sequence designed for closing the electric circuit upon the deposit of four coins of like denomination in the coin chute 4.

Alternative connections are provided between the respective bus bars 33, 39.

Referring to the spaced conductor bars 52, 45, 37 and 47, it will be noted that the spring contact fingers 50, 72, 57 and 43 in circuit with the lead-in bus bar 33 are all in their effective positions relatively to their corresponding contact pins 48, 73, 58 and 41 forming the left hand vertical row of contact pins associated with the coin chute 4, but that only one of the spring contact fingers 60 in circuit with the conductor bar 45 associated with the coin chute 2 for coins of higher denomination, is in effective position relatively to its contact pin 59 of the right hand vertical row of contact pins pertaining to the coin chute 4, and that such effective spring contact finger 60 is the second from the bottom, which signifies that it will form part of a circuit connection including the conductor bar 45, only when two coins of like denomination are deposited in the coin chute 4.

It will also be noted that the conductor bar 52 associated with the coin chute 4 is provided with a spring contact finger 51 effectively positioned over the corresponding contact pin 49 in the right hand vertical row of contact pins associated with coin chute 4, said contact pin 49 lying in position to contact the fourth coin deposited in the chute, which completes the predetermined purchase price.

A connector 53 extends from the conductor bar 52 directly to the lead-out bus bar 39, so that upon shifting inwardly the insulated auxiliary plate 10, after the deposit of the fourth coin in the coin chute 4, the spring fingers 43, 57, 72 and 50 will advance their respective contact pins 41, 58, 73 and 48 into contact with the corresponding coins, and the spring contact finger 51 connected with the conductor bar 52 will press in its stud 49 to contact the fourth coin deposited in the chute, whereupon the circuit between the bus bars 33, 39 will be completed through the upper spring contact finger 50, its contact pin 48, the coin, contact pin 49, spring contact finger 51, conductor bar 52 and connector 53.

A by-pass connector 34 extends from the lead-in bus bar 33 to a spring contact finger 35 associated with the lowermost contact pin 30 in the vertical left hand row of contact pins co-acting with coins deposited in the coin chute 2, the complementary contact pin 31 of the pair 30, 31 being engaged by a spring contact finger 36 mounted on the adjacent conductor bar 37 pertaining to the coin chute 5.

A connector 46 extends between conductor bar 45 associated with the coin chute 2 and the lead-out bus bar 39, constituting with the by-pass connector 34, contact pins 30, 31, coin 68 (Fig. 6), contact finger 36, conductor bar 37 and

connector 38, an alternative circuit to enable completion of the operating circuit in instances where the user may not have four coins of the denomination receivable in the coin chute 4, but does possess one coin of higher denomination equal in value to all four of the lesser coins and acceptable in coin chute 2.

Where the prospective user has in his possession two coins of a value acceptable in the coin chute 4 and a single coin of higher denomination equal in value to two of said lesser coins, deposit of these coins in their proper coin chutes 4 and 3, as shown in Fig. 11, will enable the completion of a circuit from the lead-in bus bar 33, through spring contact finger 57, contact pin 58, the second coin 70 of the coins deposited in the chute 4, contact pin 59, and its spring contact finger 60, conductor bar 45, connector 46, conductor bar 47, spring contact finger 61, contact pin 62, coin 76, contact pin 63, and its spring finger 64, conductor bar 37, and connector 38 to lead-out bus bar 39.

A magnet 67 is provided for releasing an article to be purchased from the vending machine, and said magnet is connected in the circuit between conductors 32 and 40 and including the battery or other source of current 66.

The lower ends of the coin channels in the plate 1 are closed by a flap 55 urged by a spring (not shown) into a position against the bottom of plate 1. An arm 56 fixed on the flap 55 is adapted to be connected with a device (not shown) for discharging the articles to be purchased from the vending machine so that the flap 55 is opened to enable the coins to drop into a collector box (not shown) upon discharge of the goods from the vending machine.

In using the device according to the present invention it may be assumed that the price of the article to be purchased from the vending machine is of a value equal to 100 units of a particular currency.

If a single coin 68 equal in value to 100 units is inserted (Fig. 6), said coin will slide through the coin slot 2 and will assume the position in the bottom of said slot as shown. When the knob 65 is then pushed inwardly, the lever 17 will be actuated to displace the plate 10 inwardly to cause the springs 35 and 36 to move the pins 30 and 31 into engagement with the coin 68. Upon engagement of the pins 30 and 31 with the coin 68, an electrical circuit will be completed from the battery 66, through wire 32, conductor bar 33, wire 34, spring 35, pin 30, coin 68, pin 31, spring 36, bar 37, wire 38, bar 39, wire 40 and magnet 67 back to the battery. Upon energizing the magnet 67 a release mechanism (not shown) will serve to discharge the article to be purchased from the vending machine.

If instead of inserting the single 100-unit coin in the machine it is desired to insert four 25-unit coins, then four of said coins are inserted into the slot or channel 4 as shown in Fig. 10. If a single 25-unit coin 69 is inserted in slot 4 as shown in Fig. 7, said coin upon pressing of knob 65 will be engaged by pins 41 and 42 but this will fail to complete a circuit between wires 32 and 40. If a second coin 70 is deposited in the slot 4 as indicated in Fig. 8, the circuit will still be incomplete and even if a third coin 71 is deposited in the slot, the circuit between wires 32 and 40 will remain incomplete (Fig. 9). However, upon inserting the final 25-unit coin 75 in slot 4 and pressing the knob 65 to bring the pins 48 and 49 into engagement with the coin

69 as indicated in Fig. 10 of the drawings, the circuit will then be completed from wire 32 through bar 33, contact spring 50, pin 48, coin 75, pin 49, contact spring 51, bar 52, wire 53, bar 39 to wire 40. Upon completion of this circuit the magnet 67 will be actuated to effect the release of the goods to be purchased.

If it is desired to effect the discharge of an article of 100-unit value from the machine by inserting two 25-unit coins and one 50-unit coin, the said two 25-unit coins 69 and 70 are inserted in slot 4 and the single 50-unit coin 76 is inserted in the slot 3 as shown in Fig. 11 of the drawings. In this case the circuit will be completed from wire 32, through bar 33, contact spring 57, pin 58, coin 70, pin 59, contact spring 60, bar 45, wire 46, bar 47, contact spring 61, pin 62, coin 76, pin 63, contact spring 64, bar 37, wire 38 and through bar 39 to wire 40. When this circuit is completed, the magnet 67 will be actuated to effect the release of the article from the machine as hereinbefore described.

In the drawings, there has been shown a plurality of contact springs and contact pins, some of which have no reference characters applied thereto. These contact springs and pins may be used for effecting release of an article from the vending machine by completion of various other circuits through various combinations of coins other than those above described. Similarly by changing the connections between the several conductor bars and pins and contact springs, the total value of the coins to be inserted to effect release of the articles may be varied.

It will be noted that the funnel-shaped member 7 is mounted on the plate 10 and is adapted to be displaced upon displacement of plate 10 inwardly to close the coin slots in plate 1 so that it will not be possible to complete an electric circuit by suspending a coin in one of the slots near the upper end thereof.

Having described my invention, I claim:

1. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, a second plate of insulating material mounted parallel to and for movement toward and away from the first-mentioned plate, and resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate.

2. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, a second plate of insulating material mounted parallel to and for movement toward and away from the first-mentioned plate, resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate, certain of said slots being adapted to receive a single coin, other of said slots being adapted to receive one or more coins, and still other of said slots being adapted to receive a plurality of coins, said pairs of pins being positioned at varying heights in said slots to engage

a single coin in the slots and one of a plurality of coins stacked edge to edge, and conductors connecting said resilient contact members to complete circuits through a coin in one or a plurality of said slots.

3. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, guides extending perpendicularly from said face of the plate, a second plate mounted on said guides parallel to the first-mentioned plate and movable toward and away from said first-mentioned plate, resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate, and means for shifting said second plate toward the first-mentioned plate.

4. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, guides extending perpendicularly from said face of the plate, a second plate mounted on said guides parallel to the first-mentioned plate and movable toward and away from said first-mentioned plate, resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate, a support carried by the free ends of said guides, a stem carried by said second plate and extending through said support, operating means for displacing said stem to move the second plate toward the first-mentioned plate, and retractable means for retaining the second plate in its displaced position.

5. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, guides extending perpendicularly from said face of the plate, a second plate mounted on said guides parallel to the first-mentioned plate and movable toward and away from said first-mentioned plate, resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate, a support carried by the free ends of said guides, a stem carried by said second plate and extending through said support, operating means for displacing said stem to move the second plate toward the first-mentioned plate, retractable means for retaining the second plate in its displaced position, and means carried by the operating means operable upon release of said operating means to retract said retaining means.

6. A coin-actuated electric circuit-completing mechanism, comprising a plate of insulating material having a plurality of coin slots therein parallel to the plane of the plate, a plurality of pairs of contact pins movably extending through one face of the plate into said slots to contact coins contained in said slots, a second plate of insulat-

ing material mounted parallel to and for movement toward and away from the first-mentioned plate, resilient contact members carried by said second plate to engage said contact pins and urge the latter into said slots upon displacement of the second plate toward the first-mentioned plate, a coin guide mounted over the entrance of said coin slots, and means for mounting said guide on said second plate whereby said guide will be displaced with the plate to block the entrance of the slots when the plate is displaced toward the first-mentioned plate.

7. In a coin-controlled machine, in combination, a base plate of insulating material having a plurality of coin slots formed in the plane of the plate for the reception of coins of different denominations, respectively, and a plurality of pairs of apertures formed transversely of the plate through one face thereof and communicating with the respective coin-slots at predetermined spaced intervals; contact pins in the apertures for movement into and out of contact with the

coins deposited in said slots; an auxiliary plate of insulating material shiftable towards and from the base plate; resilient contact fingers carried by said auxiliary plate and co-acting with individual contact pins to shift the inner ends of the pins into said slots upon shifting the auxiliary plate towards the base plate; a main motor circuit normally interrupted between the inner ends of the pairs of contact pins, contact of the inner ends of the pairs of pins with a coin in a predetermined position in one of the coin slots, which coin completes the deposit of a predetermined amount operating to complete the main circuits; alternative main circuits selective according to the values of the deposited coins, including bypass connectors effective to lead the power past those coin slots wherein no coins have been deposited, to enable the selected alternative circuit to be completed upon deposit of another combination of coins aggregating the same predetermined amount.

JOHANNES PETERSEN.

Certificate of Correction

Patent No. 2,371,260.

March 13, 1945.

JOHANNES PETERSEN

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Page 2, first column, line 8, for the word "rod" read *plunger*;
and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of March, A. D. 1949.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.