June 26, 1934. J. GEIS 1,963,988

COIN CONTROLLED SWITCH

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Fig. 1.

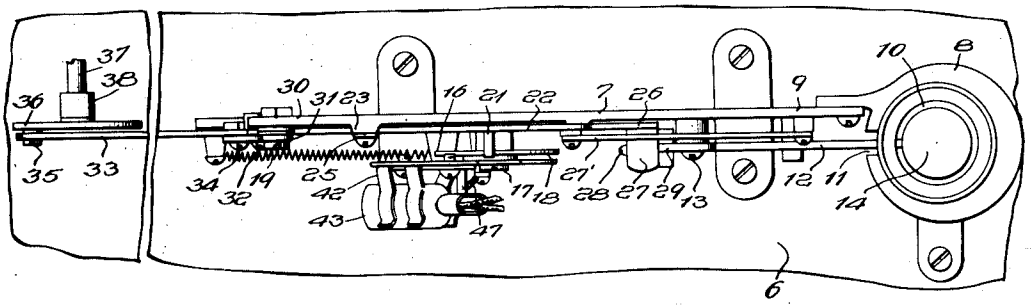


Fig. 2.

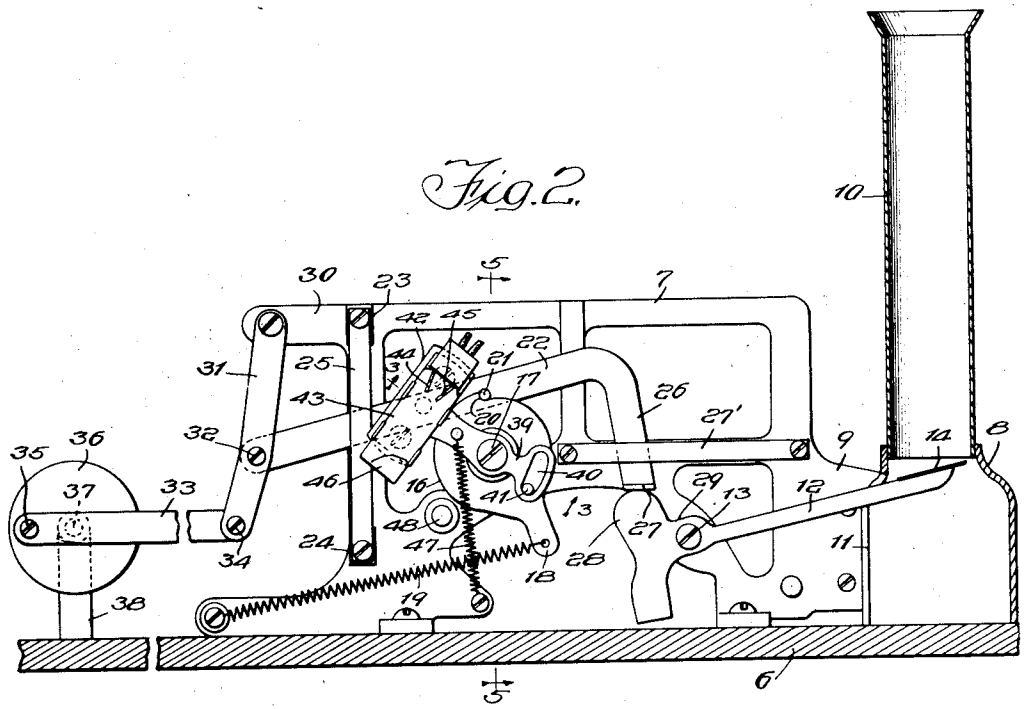
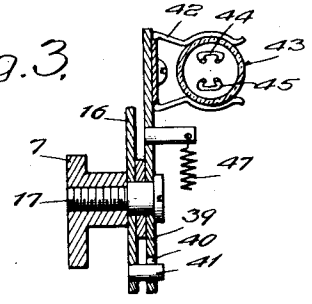


Fig. 3.



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Fig. 4.

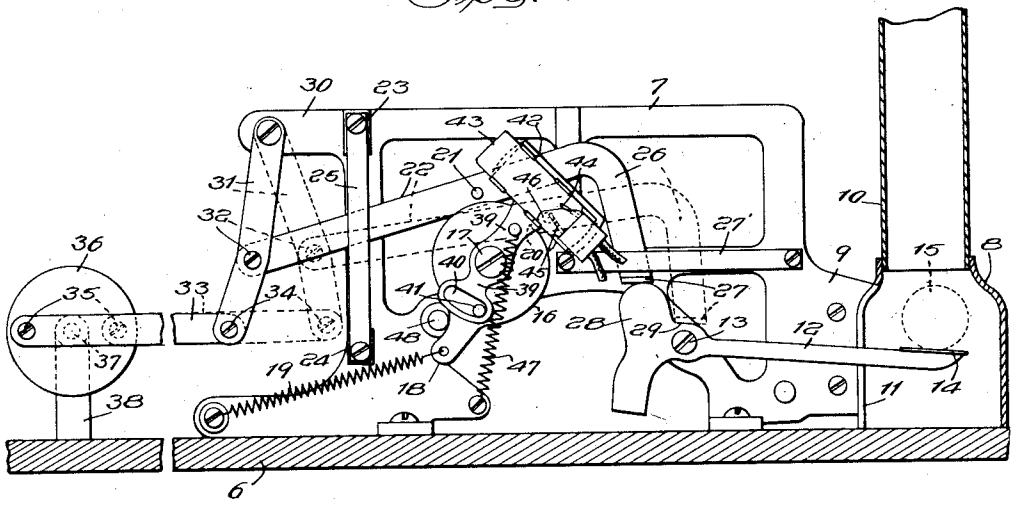
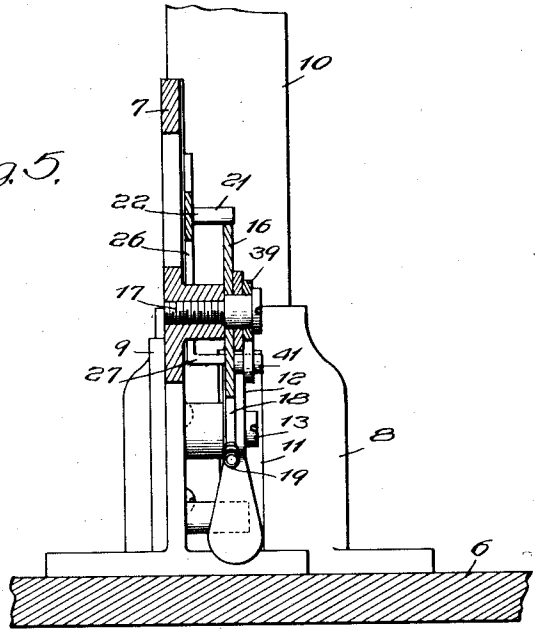


Fig. 5.



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UNITED STATES PATENT OFFICE

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COIN CONTROLLED SWITCH

Joseph Geis, Chicago, Ill., assignor to John F. Meyer, Chicago, Ill.

Application September 6, 1930, Serial No. 480,160

9 Claims. (Cl. 200—33)

This invention relates to coin-controlled switches, and more particularly to a switch which may be used in connection with an electrically operated vending or amusement machine.

The salient objects of my invention are to provide a novel coin-controlled switch embodying an enclosed circuit making-and-breaking arrangement, which will eliminate the danger attendant to arcing and which will also, to a great extent, obviate the burning of the contacts; which will be so arranged that but one operation of the switch will result from each coin inserted into the device; which will embody a minimum number of operating parts; which will embody a circuit-closing arrangement that may be either disposed in circuit-making or circuit-opening position, and which may be quickly shifted into the other position; which will be so arranged that unauthorized operation thereof without the insertion of a coin will be prevented; and which will be simple and economical in construction and positive and efficient in operation.

A selected embodiment of my invention is illustrated in the accompanying drawings, and therein

Fig. 1 is a top plan view of one form of my improved coin-controlled switch;

Fig. 2 is a side view of the device, as illustrated in Fig. 1;

Fig. 3 is a sectional view taken substantially on the line 3—3 on Fig. 2;

Fig. 4 is a view, similar to Fig. 2, showing the parts in another position; and

Fig. 5 is a vertical sectional view taken substantially on the line 5—5 on Fig. 2.

My improved switch structure is intended to be mounted on a suitable supporting base 6, and includes a main frame 7. Extending upwardly from the supporting member 6, and rested thereon, is a coin receptacle 8, a boss 9 on the frame 7 being connected to said receptacle. Extending upwardly from the upper end of the coin receptacle 8, is a coin tube 10. In one side of the receptacle 8, there is a slot 11, through which an arm 12 is extended, said arm being pivotally mounted on the frame 7 at 13. A pad 14 is provided on the end of the arm 12, disposed within the receptacle 8, and when a coin 15 (Fig. 4) is passed through the coin tube 10, said coin strikes the pad 14 and pivots the arm 12 about the pivotal mounting 13 thereof from the position shown in Fig. 2 into the position shown in Fig. 4, and this is the action which is utilized to bring about operation of the switch. A disc 16 is pivotally mounted on stud 17, carried by the frame 7, and said disc includes an arm 18, to which one end of a spring 19 is attached, the opposite end of said spring being connected to the frame 7. In the periphery of the disc 16, substantially opposite the arm 18, there is a notch 20 that is engaged by the stud 21 on the arm 22. On the frame 7, extending outwardly from the face thereof, are pads 23 and 24, and mounted thereon is a plate 25, and the arm 22 is extended through the space between the frame 7 and the plate 25. The arm 22 includes a right angularly extending portion 26, which is extended through a space between the plate 27' and the frame 7, said plate 27' being mounted on pads on the frame, similarly to the plate 25. Thus, the arm 22 is supported for free longitudinal and transverse movement on the face of the frame 7. At the lower end of the portion 26, there is a foot pad 27. A rounded boss 28 extends upwardly from the portion of the arm 12, disposed on the opposite side of the pivot 13 from the main extent of said arm, and a shoulder 29 is provided on the arm 12, adjacent the pivotal mounting 13 thereof. The frame 7 includes a forwardly extending stud 30 at the upper end thereof, and one end of a rocker 31 is pivotally mounted on said stud. The forward outer end of the arm 22 is pivotally connected to substantially the medial portion of the rocker 31, as indicated at 32. One end of a link 33 is pivotally connected to the free end of the rocker 31, as indicated at 34, and the opposite end thereof is pivotally connected, as indicated at 35, to the disc 36, adjacent the periphery of said disc. The disc 36 is supported on a shaft 37, carried by a bracket structure 38, and it is therefore manifest that when the disc 36 is rotated the link 33 will be moved, as a walking-beam, and, therefore, a rocking movement will be imparted to the rocker 31. Pivotally mounted on the stud 17 is an arm 39, having an elongated slot 40 adjacent one end thereof, into which a pin 41 on the disc 16 is extended. At the opposite end of the arm 39, there is a clamp structure 42, in which a circuit-closing arrangement, generally indicated by 43, is mounted. In the preferred form of the invention, the circuit-closing arrangement 43 consists of a closed glass tube, having contacts 44 and 45 disposed at one end thereof, and in which tube a globule 46 of mercury, or other heavy liquid, is arranged. A spring 47 extends between a stud on the arm 29, adjacent the clamping arrangement and a stud on the frame 7, and this spring and the

parts associated with the arm 39 provide an over-center device. On the frame 7, there is a stop lug 48, toward which the arm 18 is urged by the spring 19.

In the illustrated form of the invention, the switch is arranged to close a circuit when a coin 15 is introduced through the coin tube 10. The shaft 37 is rotated by an electric motor, or the like, the circuit to which includes the contacts 44 and 45. When the parts are at rest, the disc 36 and other mechanisms are arranged in the position illustrated in Fig. 2, and by reference thereto, it will be noted that the switch arrangement 43 is so disposed that the globule of mercury 46 is arranged at the end of the tube opposite the end carrying the contacts 44 and 45 and, therefore, the circuit to the motor, operating the shaft 37, is opened. By reserving the position of the closed glass tube, the operation of the switch may be reversed. It will be noted that the connection 35 is disposed in a position away from the frame 7, and that the rocker 31 has been moved forwardly. This movement of the rocker 31 is transmitted to the arm 22, which also moves forwardly, and the stud 21 will seat in the notch 20 and rotate the disc 16 to move the arm 18 away from the stop lug 48, which will tension the spring 19. The foot pad 27 will rest on the rounded portion 28. When a coin passes through the tube 10 and strikes the pad 14, the arm 12 is pivoted, and the rounded portion 28 moves from a lower into an upper position and, therefore, the foot pad 27, resting on the rounded portion, is moved upwardly from the position shown in Fig. 2 into the position shown in Fig. 4, which disengages the stud 21 from the notch 20, and the spring 19 moves the arm 18 and, therefore, the disc 16 in a clockwise direction. The extension of the spring 47 between the studs on the arm 39 and the frame 7 provides an over-center device, and as the disc 16 rotates in a clockwise direction, the engagement of the pin 41 with the adjacent end of the slot 40 will cause the arm 39 to be pivoted, and when the extension of the spring 47 is such that it is disposed on the side of the stud 17 opposite that where it is shown in Fig. 2, said spring will contract to pivot the arm 39 into the position illustrated in Fig. 4 and, therefore, the switch arrangement 43 will be tipped in the opposite direction, and the globule of mercury 46 will close the circuit between the contacts 44 and 45. This will set the motor, which drives the shaft 37, in operation, and as said shaft operates, the disc 36 will be rotated and movement thereof will be transmitted to the rocker 31 and, in turn, to the arm 22, which will move rearwardly or toward the coin chute 10, and when the pivotal connection 35 is in a position diametrically opposite to that shown in Fig. 2 (illustrated in dotted lines in Fig. 4), the foot pad 27 will have disengaged the rounded portion 28 and will be seated on the shoulder 29. This position disposes the stud 21 forwardly of the notch 20, and as the disc 36 continues to rotate, said stud will engage said notch and rotate the disc 16 in a counter-clockwise direction. The pin 41 will now be engaging the other end of the notch 40 and, therefore, the arm 39 will move with the disc 16 until the extension of the spring 47 is such that it is on the side of the stud 17, in which it is shown in Fig. 2, and as soon as the extension of said spring is on this side, the arm 39 will be moved thereby into the position shown in Fig. 2, and thus the globule of mercury will be at the end of the tube opposite the contacts 44 and 45 and, therefore, circuit to the motor, driving the shaft 37, will be interrupted, and the parts will stop in the position illustrated in Fig. 2 and will again be ready for operation.

While I have illustrated the invention as embodying an over-center device, it is to be understood that such a device might be omitted, and the tube would, in such instance, be directly connected to the disc 16 and would move therewith to alternately engage or disengage the globule of mercury with the spaced contacts arranged at one end thereof.

While I have illustrated and described a selected embodiment of my invention, it is to be understood that this is capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a switch, a rotatable member, circuit controlling means, means for connecting said circuit controlling means to said rotatable member, means for urging said rotatable member into a determined position, means for moving and holding said rotatable member against the action of said urging means to locate and hold said circuit controlling means in a predetermined position, and means for disengaging the moving and holding means from said rotatable member to permit said rotatable member to move into said determined position whereby said circuit controlling means will be disposed in another position.

2. In a switch, a rotatable member, circuit controlling means, means connecting said circuit controlling means to said rotatable member for operation thereby, means urging said rotatable member into a determined position, moving and holding means including a slidable arm having detachable engagement with said rotatable member and adapted to move the rotatable member against the action of said urging means into a predetermined position and to hold said member in said position, and means for disengaging said arm from said rotatable member whereby said urging means may move said rotatable member into said determined position.

3. In a switch, a rotatable member having a notch therein, circuit controlling means, means connecting said circuit controlling means to said rotatable member for operation thereby, means urging said rotatable member into a determined position, moving and holding means including a slidable arm embodying a part having detachable engagement with said notch whereby said rotatable member may be moved and held in a determined position against the action of said urging means, and means for moving said slidable arm to disconnect said part from said rotatable member whereby said urging means may move said rotatable member into said determined position.

4. In a switch, a rotatable member, circuit controlling means, an over-center device for connecting said circuit controlling means to said rotatable member for operation thereby, means urging said rotatable member into a determined position, a slidable arm having detachable engagement with said rotatable member, means for moving said slidable arm in one direction to move said rotatable member against the action of said urging means into an operative position and act-

ing through said arm to hold said member in said operative position, and other means for moving said slidable arm to disengage the same from said rotatable member whereby said urging means may move said rotatable member in said determined position.

5. In a switch, a rotatable member, an over-center device including a rockable member, means connecting said rockable member to said rotatable member for movement relative to said rotatable member, a spring for snapping said rockable member into alternate positions as said rockable member is moved past center by said rotatable member, circuit controlling means carried by said rockable member, means urging said rotatable member into a determined position, a reciprocable member adapted for detachable engagement with said rotatable member, means for moving and holding said reciprocable member to move and hold said rotatable member against the action of said urging means, a pivotally mounted member, and a part on said reciprocable member resting on said pivotally mounted member and adapted to be disengaged therefrom upon movement of the pivotally mounted member to thereby disengage said reciprocable member from said rotatable member to permit movement of said rotatable member by said urging means, movement of said rotatable member upon disengagement therefrom of said reciprocable member being imparted to said rockable member and the circuit controlling means carried thereby.

6. In a switch, a rotatable member, an over-center device including a rockable member having a slot therein, a pin fast to said rotatable member and mounted in said slot, a spring for snapping said rockable member into alternate positions as said rockable member is moved past center by said rotatable member, circuit controlling means carried by said rockable member, means urging said rotatable member into a determined position, a reciprocable member adapted for detachable engagement with said rotatable member, operating means movable through a cycle of operation and connected with said reciprocable member to reciprocate the same to move it into engagement with said rotatable member and to move said rotatable member against the action of said urging means, said operating means holding said rotatable member against the action of said urging means when said operating means is in its at rest position, and a part on said reciprocable member resting on said pivotally mounted member and adapted to be disengaged therefrom upon movement of the pivotally mounted member to thereby disengage said reciprocable member from said rotatable member to permit movement of said rotatable member by said urging means, movement of said rotatable member upon disengagement therefrom of said reciprocable member being imparted through the pin and slot connection between the rotatable member and the rockable member to move said rockable member whereby said spring may snap said rockable member into a determined position to thereby actuate said circuit controlling means.

7. In a switch which has operated means, the combination therewith of a rockable member, circuit controlling means mounted on said rockable member, a rotatable member mounted in juxtaposition to said rockable member and having a pin thereon, said rockable member being mounted medially and having a slot at the end thereof opposite the end at which said circuit controlling means is mounted, said pin being mounted in said slot, a spring connected to said rockable member intermediate the circuit controlling means and the pivot of said rockable member, the other end of said spring being anchored below the pivot for said rockable member, a reciprocable member adapted for detachable engagement with said rotatable member, operating means movable through a cycle of operation and connected with said reciprocable member to reciprocate the same to move it into engagement with said rotatable member and to move said rotatable member against the action of said urging means, said operating means holding said rotatable member against the action of said urging means when said operating means is in its at rest position, and a part on said reciprocable member resting on a pivotally mounted member in said operated means and adapted to be disengaged therefrom upon movement of the pivotally mounted member to thereby disengage said reciprocable member from said rotatable member to permit movement of said rotatable member by said urging means, movement of said rotatable member upon disengagement therefrom of said reciprocable member being imparted through the pin and slot connection between the rotatable member and the rockable member to move said rockable member whereby said spring may snap said rockable member into a determined position to thereby actuate said circuit controlling means.

8. In a switch which has operated means, the combination therewith of a frame, a rockable member, circuit controlling means mounted at one end of said rockable member, a rotatable member, a common pivot for said rockable member and said rotatable member, said rockable member being medially mounted on said pivot and having the slot at the end thereof opposite that at which said circuit controlling means is mounted, a pin on said rotatable member and extended into said slot, a spring connected to said rockable member intermediate the circuit controlling means in said pivot, the other end of said spring being connected to said frame below the pivot for said rockable member, a reciprocable member adapted for detachable engagement with said rotatable member, operating means movable through a cycle of operation and connected with said reciprocable member to reciprocate the same to move it into engagement with said rotatable member and to move said rotatable member against the action of said urging means, said operating means holding said rotatable member against the action of said urging means when said operating means is in its at rest position, and a part on said reciprocable member resting on a pivotally mounted member in said operated means and adapted to be disengaged therefrom upon movement of the pivotally mounted member to thereby disengage said reciprocable member from said rotatable member to permit movement of said rotatable member by said urging means, movement of said rotatable member upon disengagement therefrom of said reciprocable member being imparted through the pin and slot connection between the rotatable member and the rockable member to move said rockable member whereby said spring may snap said rockable member into a determined position to thereby actuate said circuit controlling means.

9. In a switch, a frame, a disc rotatably mount-

ed on said frame and having a notch in the periphery thereof, a slidable arm mounted on said frame and having a stud thereon engageable in said notch, circuit controlling means connected to said disc, yieldable means acting on said disc and urging said circuit controlling means into a predetermined position, motivating means connected to said arm to move the same and engage said stud in said notch to move and hold said disc against the action of said yieldable means to move said circuit controlling means from said predetermined position, and means for moving said arm to disengage said stud from said notch and permit said yieldable means to rotate said disc to move said circuit controlling means back into its predetermined position.

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