Nov. 17, 1925. 1,562,178

F. L. McCORMICK

DEVICE FOR CONTROLLING COIN OPERATED INSTRUMENTS AND MACHINES

Filed July 14, 1921

Fig. 1.

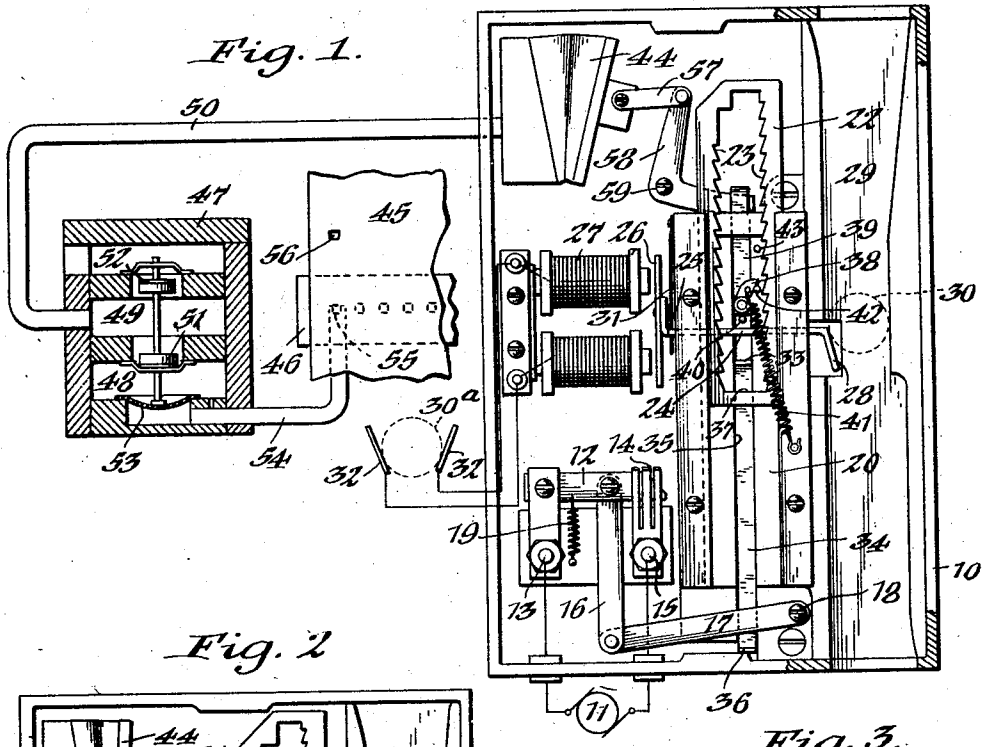


Fig. 2

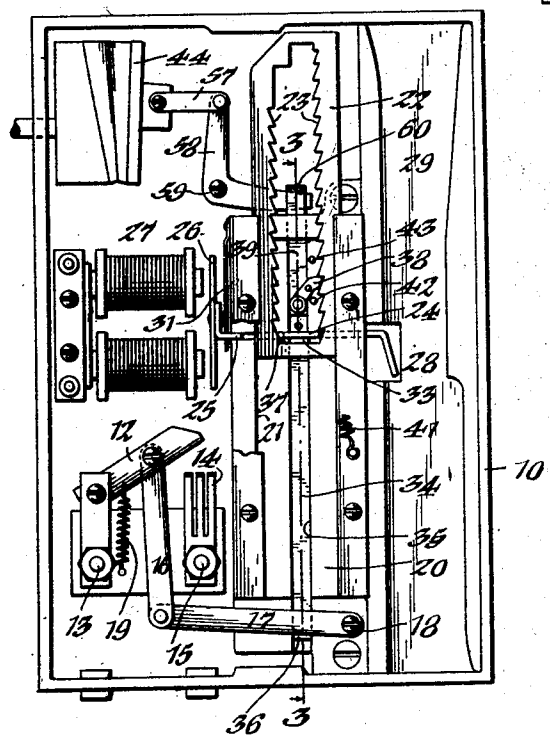
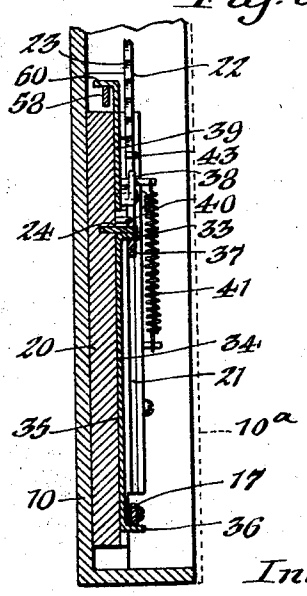


Fig. 3.



Inventor,
Frank L. McCormick
by Geyer Popp
Attorneys.

Patented Nov. 17, 1925. 1,562,178

UNITED STATES PATENT OFFICE.

FRANK L. McCORMICK, OF NORTH TONAWANDA, NEW YORK, ASSIGNOR TO THE RUDOLPH WURLITZER MANUFACTURING COMPANY, OF NORTH TONAWANDA, NEW YORK, A CORPORATION OF NEW YORK.

DEVICE FOR CONTROLLING COIN-OPERATED INSTRUMENTS AND MACHINES.

Application filed July 14, 1921. Serial No. 484,616.

To all whom it may concern:

Be it known that I, FRANK L. McCORMICK, a citizen of the United States, residing at North Tonawanda, in the county of Niagara and State of New York, have invented new and useful Improvements in Devices for Controlling Coin-Operated Instruments and Machines, of which the following is a specification.

This invention relates to a controlling device for automatic musical instruments, and other devices or machines operated by a coin-controlled electric motor or other source of power.

A controlling device of this character is shown in United States Letters Patent No. 1,124,814, issued to the Rudolph Wurlitzer Manufacturing Co., January 12, 1915, as assignee of Joseph W. Scharold.

The object of the present invention is to provide an improved controlling device of this character which is reliable in operation and compact and inexpensive in construction.

In the accompanying drawings:

Figure 1 is a sectional elevation of the controlling device with the cover of the casing removed and the motor switch closed.

Figure 2 is a similar view, showing the motor switch open.

Figure 3 is a vertical section on line 3—3, Fig. 2.

Similar characters of reference indicate corresponding parts throughout the several views.

The operative parts of the controlling device are enclosed in a suitable casing or box 10 having a cover 10^a (shown by dotted lines in Fig. 3).

11 indicates the electric motor of the automatic musical instrument which is included in a suitable circuit controlled by a switch of any well-known construction. That shown in the drawings consists of a vertically-swinging switch lever 12 connected to one terminal 13 of the motor circuit and co-operating with a contact spring 14 connected to the other terminal 15 of said circuit. This switch lever is connected by a link 16 with a vertically swinging actuating lever 17 pivoted at 18 to the casing 10. A coil spring 19 tends to close the switch lever 12.

The actuating lever 17 is swung in the proper direction to open the switch lever by means which are preferably constructed as follows:

Arranged within the casing and secured to its rear wall is an upright block or support 20 which is provided with vertical ways 21 in which is guided a longitudinally-slotted rectangular slide 22. The inner longitudinal edges of the latter are provided with oppositely-facing ratchet or escapement teeth 23 which are adapted to be engaged alternately by a double-ended detent pawl 24 carried by a transversely-reciprocating bar or shank 25. The free end of this detent bar is provided with an inclined trip member, cam or finger 28 which projects obliquely into the coin-path or passage of a coin chute 29, so as to be tripped by a deposited coin 30, thereby shifting or wedging the detent pawl out of engagement with the right-hand row of ratchet teeth of the slide 22 and into engagement with the left-hand row. A return spring 31 is provided which constantly tends to shift the detent-bar 25 toward the chute to normally project the finger 28 into the passage of the coin chute. Thus, whenever a coin is dropped into the chute, the pawl bar is reciprocated and the slide 22 is allowed to drop by gravity the distance of one tooth, the toothed slide and the detent pawl constituting an escapement. In the normal position of the detent pawl, the distance between the lower portion of its oblique trip finger and the opposite wall of the chute is less than the diameter of a proper coin, so that the pawl is wedged aside by the descending coin.

Projecting into the slot of the slide 22 is a lip 33 formed at the upper end of a vertical lift bar 34 guided in the lower portion of a way 35 in the upright block 20. The lower end of this bar terminates in an outwardly-bent lip or projection 36 which is adapted for engagement with the lower edge of the switch actuating lever 17. In the position of the parts shown in Fig. 1, this lower lip normally rests on the bottom of the casing. The relation of the upper lip 33 to the lower cross bar 37 of the slide is such that when the slide is raised to its highest position, as shown in Fig. 2, said cross bar engages the upper lip, lifting the bar 34 and causing the lower lip 36 to raise the actuating lever 17 sufficiently to open the

switch lever 12 and break the motor circuit. When the slide occupies any other position, such, for example, as that shown in Fig. 1, its lower cross bar 37 is more or less removed from the upper lip 33, in which position the motor switch is unaffected by the ascent of the slide and therefore remains closed.

The slide 22 is elevated intermittently one tooth at a time, by a spring-pressed feed pawl 38 engaging one of the rows of ratchet teeth 23 and pivoted on a vertically-reciprocating bar or carrier 39 guided in the upper portion of the way 35 in the block 20. The downward stroke of this bar is limited by a pin 40 fixed to said block, toward which pin said bar is constantly urged by a spring 41 connected at one end to the feed pawl in front of its pivot and at its other end to a fixed part of the casing 10. This spring, besides functioning to urge the bar 39 downwardly, also constantly tends to swing the pawl 38 toward the opposing ratchet teeth of the slide. In the lowered position of the parts, as shown in Fig. 1, in which position the bar 39 is in its lowest position, the pawl is held clear of said teeth by a stop pin 42 projecting from the support 20 into the slot of the slide. Arranged in a substantially vertical line above said stop pin 42 is another fixed stop pin 43 with which the upper edge of the feed pawl is adapted to engage, so as to limit each upward stroke of the slide to the length of one of its teeth.

When the improvement is applied to an automatic musical instrument, as herein shown by way of example, the reciprocating bar 39 is preferably actuated by a motor pneumatic 44 controlled by the pneumatic action of the instrument. The pneumatic action may be of any known type, that shown in the drawings being controlled by a perforated music sheet 45 traveling over the tracker board 46 and comprising a wind chest 47 containing the customary suction chamber 48 from which the air is constantly exhausted during the playing of the instrument; a chamber 49 with which the pneumatic 44 is connected by a conduit 50 and which is alternately exhausted and flushed by the action of the usual suction valve 51 and flushing valve 52 mounted on a common stem actuated by the customary diaphragm 53, the chamber beneath this diaphragm being connected by a conduit 54 with one of the tracker ducts 55. This duct co-operates with a row of perforations in the music sheet one of which is shown at 56. Such a perforation is usually arranged at the end of each selection of the sheet.

The movable board of the pneumatic 44 is connected by a link 57 with one arm of a bell crank lever 58 fulcrumed at 59 to the rear wall of the casing 10, while its other arm is overlapped by a rearwardly facing lip 60 arranged at the upper end of the reciprocating bar 39, so that upon each collapse of the pneumatic, the bell crank is rocked in a direction to lift said bar and raise the slide 22 the distance of one tooth.

The operation of the controlling device is as follows:

In the initial or highest position of the slide 22, shown in Fig. 2, the switch lever 12 is disengaged from its terminal contact 14 and the motor circuit is therefore broken. When a coin is deposited in the chute 29, it strikes the inclined finger 28 of the detent pawl 24 and momentarily trips it out of engagement with the ratchet teeth of the slide 22, allowing the latter to drop the distance of one tooth and permitting the lift bar 34 to drop far enough to allow the spring 19 to close the switch lever and establish the motor circuit. The instrument then begins to play the first selection on the music sheet. If no additional coins are deposited during the playing of that selection, the motor pneumatic 44 is deflated at the end of the selection by the registration of the controlling perforation 56 of the music sheet with the corresponding tracker duct, thereby elevating the slide 22 and the lift bar 34 to their initial position, breaking the motor circuit, as hereinbefore described, and stopping the instrument. If, however, a second coin is deposited during the playing of the first selection, the detent pawl 24 is again tripped and the slide 22 allowed to drop the distance of another tooth, leaving the switch lever closed and undisturbed and removing the lower cross bar 37 of the slide a distance of two teeth from the lip 33 of said lifting bar. Under these conditions, after playing the first selection, the motor pneumatic 44 is deflated and the slide 22 is raised one tooth through the medium of the bell crank lever 58, the reciprocating bar 39, lip 60 and feed-pawl 38, but since said slide was previously dropped two teeth, the cross bar 37 of said slide stops short of the lip 33, and the switch lever therefore remains closed. The instrument thereupon plays the second selection on the music sheet and at the end thereof, the second controlling perforation comes into action, causing the motor pneumatic to be deflated a second time, breaking the motor circuit and stopping the instrument after having played two selections for the two coins deposited. Should additional coins be deposited during the playing of either selection, the slide 22 will be lowered another tooth for each coin deposited and after the completion of each selection the slide will be raised one tooth, thus insuring the playing of a selection for every coin deposited. It is only after a selection has been played for every coin deposited that the switch-actuating lever 17 is moved to open the motor switch and stop the instrument.

In the operation of the device as above described, it is assumed that the same is applied to the musical instrument and that the coins are deposited directly into the coin chute 29 to trip the detent pawl 24.

To adapt the device for use with a plurality of auxiliary coin boxes placed at different tables or stations at a distance from the musical instrument, as more fully described in the Letters Patent hereinbefore referred to, an electric magnet 27 is employed in the main box 10 for actuating the detent pawl 24 every time a coin is deposited in one of such auxiliary boxes. For this purpose, the armature 27 of the magnet is secured to the adjacent rear end of the detent pawl. The magnet is included in a circuit containing these auxiliary coin boxes, and the terminal or switch contacts of the latter are connected in parallel, so that the magnet circuit will be closed by the deposit of a proper coin in any one of such boxes, the coins bridging the contacts momentarily to quickly make and break the circuit and attract and release the armature once for every coin deposited. The terminal contacts of one of such auxiliary coin boxes are shown diagrammatically at 32 in Fig. 1. Whenever the magnet-circuit is closed, the detent pawl 24 is actuated to allow the slide 22 to drop the distance of one tooth for each coin deposited in an auxiliary coin box, the same as when the inclined finger 28 of that pawl is tripped by a coin dropped into the main box 10.

I claim as my invention:

1. In a device of the character described, the combination of a coin chute, a motor-controlling switch-member, an intermittently-movable slide controlling said switch-member, and a reciprocating detent device co-operating with said slide for controlling its movement, said detent device being operated by the weight of a coin and having an inclined trip member projecting into the coin-path of said coin-chute.

2. In a device of the character described, the combination of a coin chute, a motor-controlling switch-member, an intermittently-movable slide controlling said switch-member, and a reciprocating detent device co-operating with said slide for controlling its movement, said detent device being operated by the weight of a coin and having an inclined finger projecting into the coin-path of said coin-chute, said finger being normally spaced from the opposite wall of the chute a distance less than the diameter of a proper coin.

3. In a device of the character described, the combination of a switch member, a slide for controlling said switch member, said slide having ratchet teeth, a coin controlled detent device co-operating with said teeth, a reciprocating bar slidable lengthwise of the slide, means for actuating said bar, a feed pawl mounted on said bar and arranged to engage said ratchet teeth, and a spring connected to said feed pawl and tending to simultaneously depress said bar and move the feed pawl into engagement with the toothed slide.

FRANK L. McCORMICK.