No. 852,848. PATENTED MAY 7, 1907.

H. K. SANDELL.

COIN ACTUATED DEVICE FOR CONTROLLING THE OPERATION OF COIN OPERATED MACHINES.

APPLICATION FILED JAN. 17, 1907.

4 SHEETS—SHEET 1.

Fig. 1.

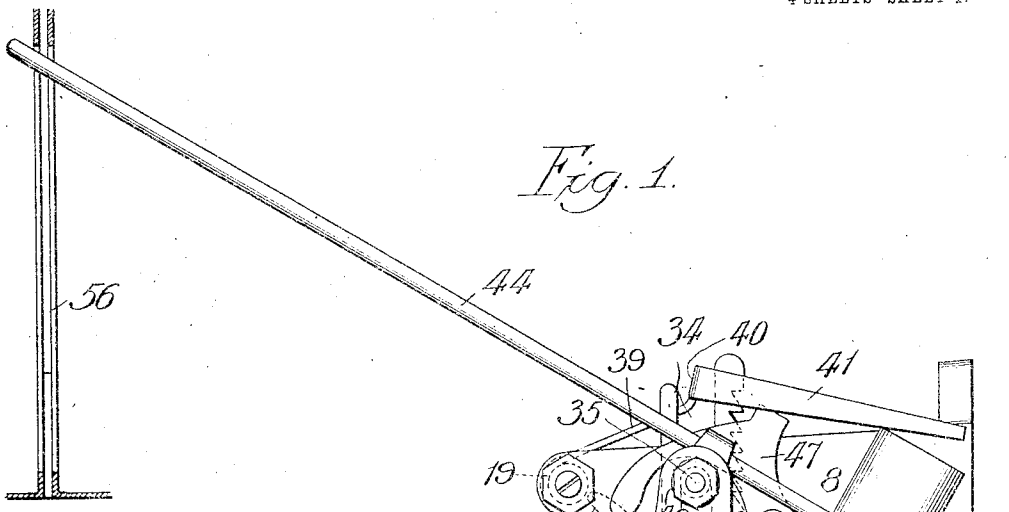
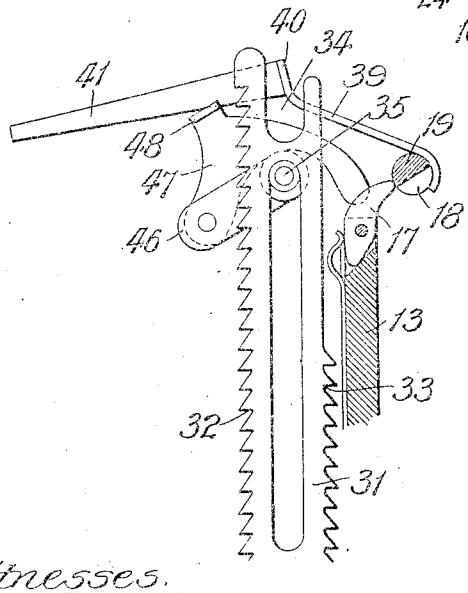


Fig. 2.



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4 SHEETS—SHEET 2.

Fig. 3.

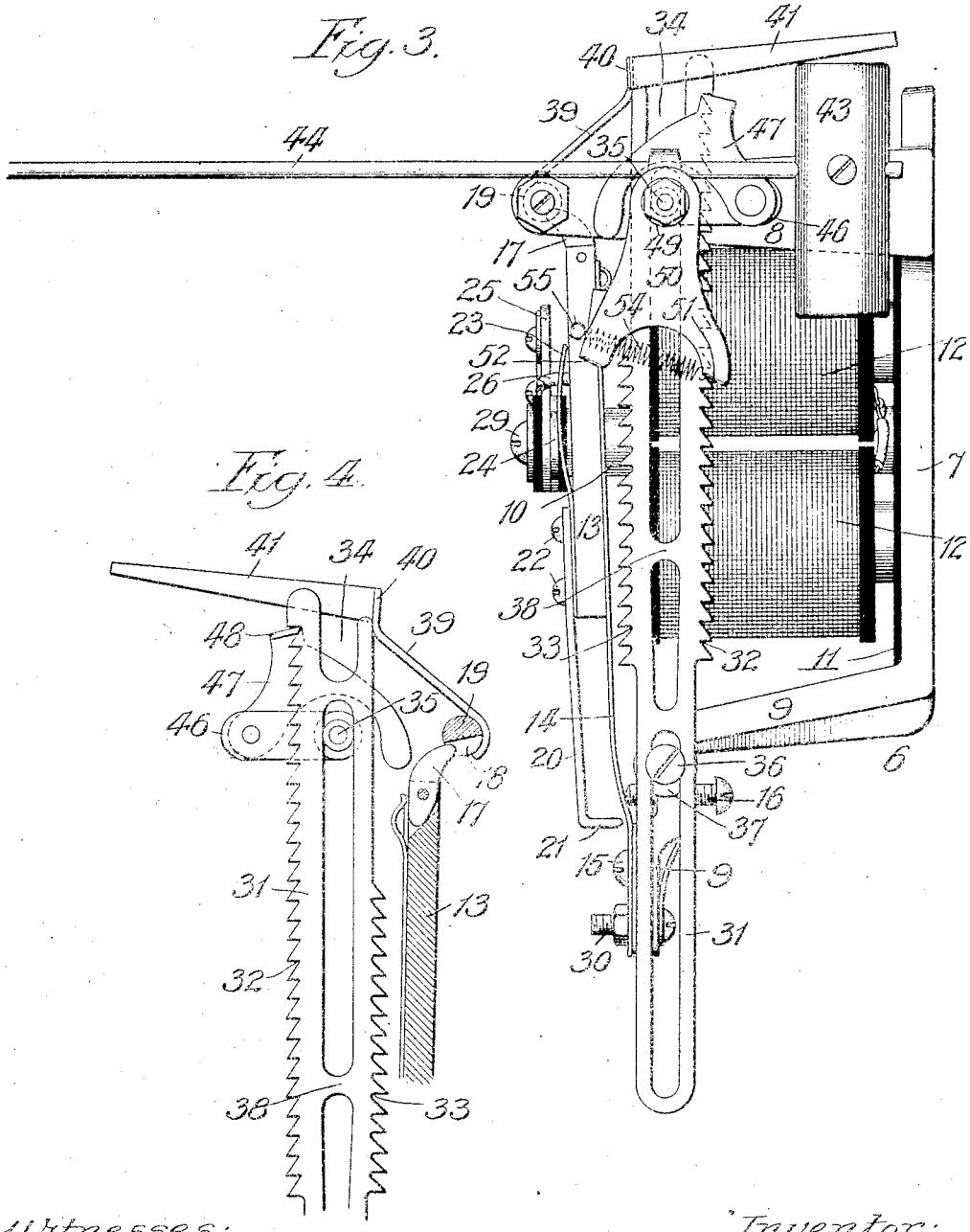


Fig. 4.

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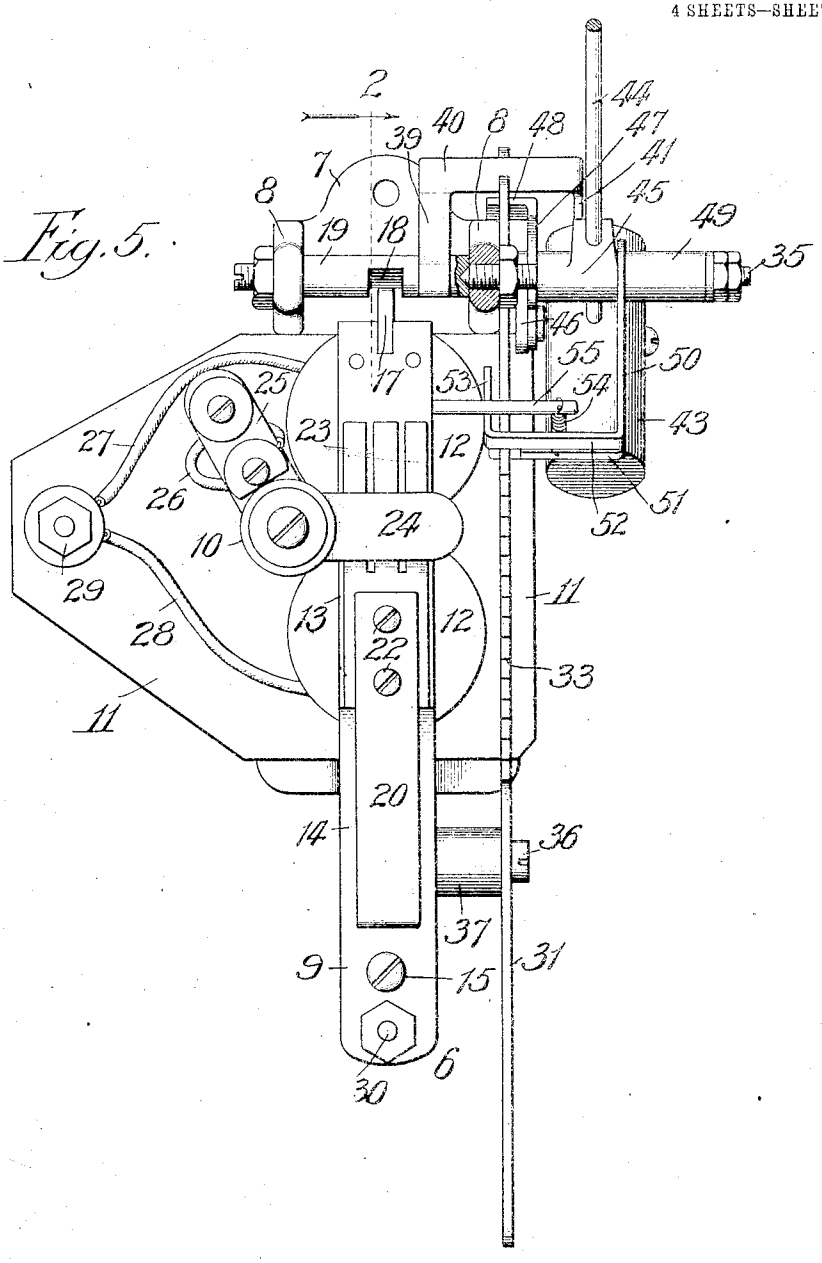
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4 SHEETS—SHEET 3.

Fig. 5.



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4 SHEETS—SHEET 4.

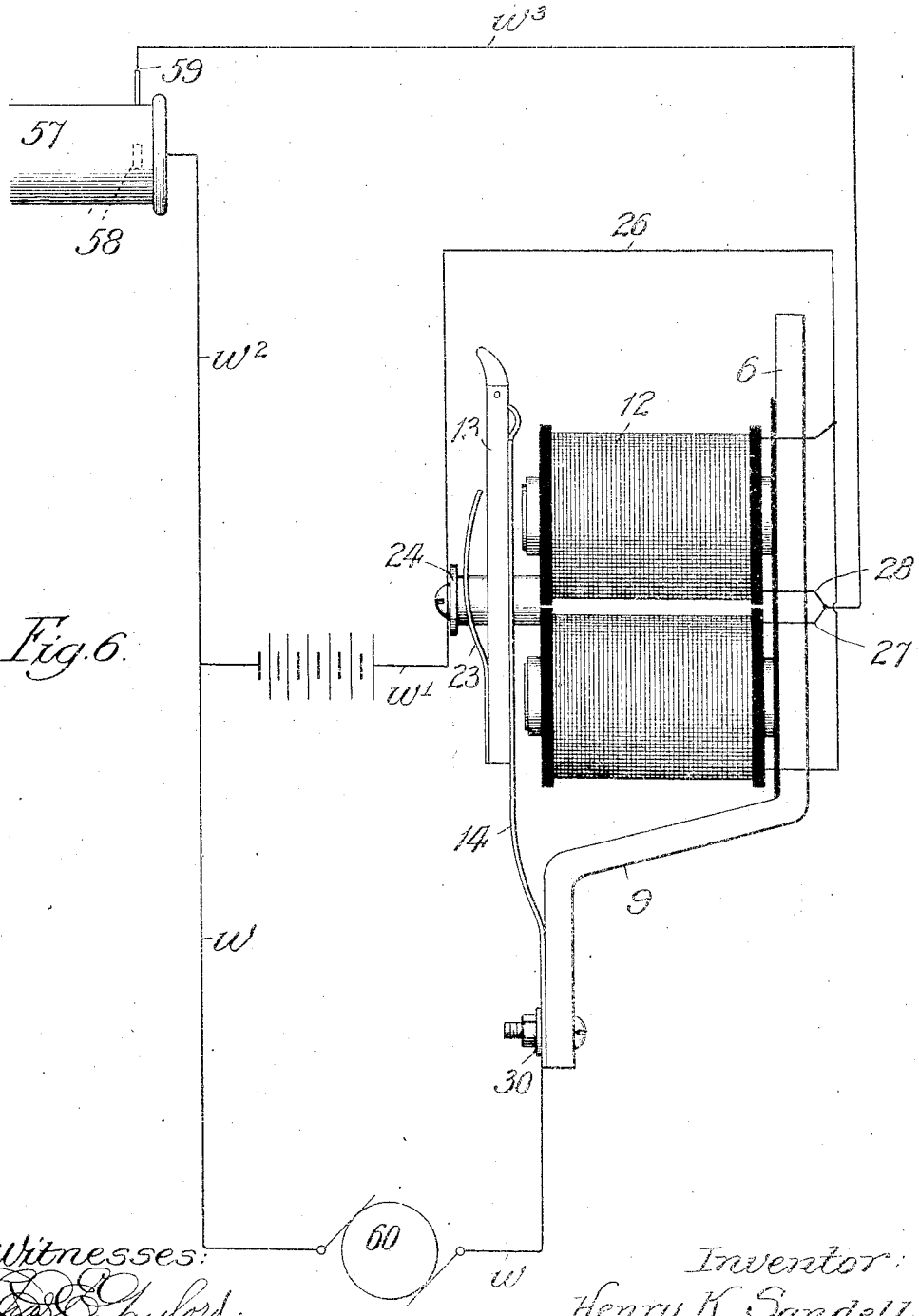


Fig. 6.

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UNITED STATES PATENT OFFICE.

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COIN-ACTUATED DEVICE FOR CONTROLLING THE OPERATION OF COIN-OPERATED MACHINES.

No. 852,848. Specification of Letters Patent. Patented May 7, 1907.

Application filed January 17, 1907. Serial No. 352,671.

To all whom it may concern:

Be it known that I, HENRY K. SANDELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Coin-Actuated Devices for Controlling the Operation of Coin-Operated Machines, of which the following is a specification.

In coin-operated machines of the class in which the insertion of a coin starts the action of the operating mechanism, the insertion of a second coin, or of a succession of coins, before the machine has completed its operation as the result of the first insertion, is liable to disorganize the mechanism in one way or another.

The object of my invention is to provide a device for use with machines of the class referred to, which shall permit a plurality of coins to be inserted into a machine while it is operating as the result of one insertion and cause repeated complete operation of the machine once for each inserted coin, and which shall arrest the operation upon completion of the final operation resulting from the last-inserted coin.

A device for the aforesaid purpose embodying my invention in a preferred construction, as to matters of detail, is illustrated in the accompanying drawings, in which—

Figure 1 represents the device in its normal condition by a view in side elevation and in operative connection with a coin-chute, shown in vertical sectional elevation; Fig. 2 is a broken section taken at the line 2 on Fig. 5 and viewed in the direction of the arrow; Fig. 3, a view like that presented by Fig. 1 but showing the device with the parts in the condition to which they have been brought by the insertion of four coins into the chute before the machine to which the chute leads has completed its operation as the result of inserting the first coin; Fig. 4, a section like that presented by Fig. 2, but with the parts in the same condition as that described in connection with Fig. 3; Fig. 5, a broken bottom plan view of the device with a portion of its primary actuating-arm broken away, and Fig. 6, a diagram showing the device as operatively connected in an electric circuit.

While my invention is useful, in the same or different forms of embodiment, in connection with various kinds of coin-operated machines, including sound-producing machines, such as coin-operated phonographs and analogous instruments, picture-exhibiting machines, gas and other meters, I have more especially devised it for coin-operated music-machines. The following description of the device and its operation will be made, therefore, in its relation to a coin-operated music-machine employing a traveling perforated music-sheet for producing the music, like the electric self-playing violin for which Letters Patent No. 807,871 were granted to me December 19, 1905.

A supporting frame 6 for the mechanism of the device, which may be a metal casting, consists of a flat back 7 having an arm 8 projecting horizontally from its upper end and bifurcated toward its outer extremity, a bracket 9, of inverted-L shape projecting forwardly, under the arm 8, from its lower end, and a post 10 projecting horizontally from near one edge between the planes of the arm and bracket. On the front side of the back 7 is shown fastened a sheet 11 of insulating material, such as vulcanite fiber, projecting beyond the lateral edges of the back and fitted about the base of the post. On the insulated back 7 are fastened the two spools of an electro-magnet 12, the armature 13 of which is supported to extend over the magnet-poles on a flat spring 14 fastened by a screw 15 to the foot-portion of the bracket 9, in which a set-screw 16 works against the under side of the spring for regulating its tension. In the free end of the armature is pivoted a spring-pressed tongue 17 to project resiliently into a recess 18 provided in one side and between the ends of a rock-shaft 19 journaled at its extremities in the bifurcated end of the arm 8 (Fig. 5). A metal strip 20 fastened at one end to the armature extends therefrom lengthwise over the spring 14 and is formed at its free end with a lip 21 projecting into close proximity with the spring to keep the armature in a straight position by the lip engaging the spring when the armature is attracted and resisting any tendency of the force of the attraction to bend the armature-spring 14.

The screws 22 which fasten the strip 20 to the armature also fasten thereto a contact-spring 23, which is held by the armature, in

its retracted position under the tendency of the spring 14, against a contact-finger 24 projecting across the spring 23 from the post 10 and having bearing-contact with another metal finger 25 projecting laterally and insulated from the outer end of the post, to which finger 25 one end of wires 26 is connected, the opposite end thereof being connected with corresponding terminals of the magnet-spools, the other terminals of which are connected by wires 27 and 28 with a binding-post 29 on the sheet 11. Another binding-post 30 is provided on the bracket 9 connected in the circuit of an electrical generator.

A longitudinally slotted bar 31, having rows of ratchet-teeth, 32 and 33, respectively on its opposite edges and in staggered relation to each other, contains in its upper end a recess 34, shown in approximate U-shape. This ratchet-bar is confined on the frame to adapt it to be reciprocated vertically, by a rigid rod 35 extending horizontally from a side of the bifurcated arm 8 through the upper slot in the bar, and by a screw 36 passing through the lower slot in the bar into the end of a stud 37 projecting laterally from the bracket 9 parallel with the rod 35, between which stud and the head of the screw the ratchet-bar is movably and guidingly confined. The slot is shown to have a transverse bracing-rib 38 forming a stop to engage with the rod 35 and limit the upward movement of the bar; and the base of the recess 34 rests on the rod 35 when the bar is in its lowermost position.

On the rock-shaft 19, to one side of its contained recess 18, is secured, to rock with it, an angular bracket consisting of an arm 39, forming the member by which it is so fastened to the rock-shaft, and having a forearm-section 40 extending at a right-angle from its outer end, and a finger 41 extending at a right-angle from the outer end of the section 40 in the direction that the arm 39 extends. When the ratchet-bar 31 is in its lowermost position, the bracket-section 40 extends across it in the recess 34, being thrown to that position by the weight of the bracket and thereby turning the shaft 19 part-way around sufficiently to take the recess 18 out of registration with the armature spring-tongue 17, for the purpose hereinafter explained; and turning the rock-shaft in the opposite direction, as hereinafter described, brings that recess into registration with the tongue. In the first-named, or normal, position of this bracket, its finger extends into the path of a weight 43 adjustably fastened on the end of a long trip-arm 44, which is supported near its weighted end on a sleeve 45 rotatably surrounding the rod 35 and having a crank-arm 46 extending from its inner end. On the free end of this crank-arm is pivoted a pawl, that shown consisting of a hook-shaped body 47, one end of which is pivoted to the crank-arm 46, whence it extends across the rod 35, and a rigid finger 48, forming the pawl proper, extending at a right-angle from the body across the plane of the edge of the ratchet-bar provided with the teeth 32, whereby depressing the trip-finger 44 turns the sleeve carrying it to engage the pawl 48 with the adjacent ratchet-teeth, to lift the bar 31, as and for the purpose hereinafter more fully described. On the rod 35 is further mounted to oscillate thereon a sleeve 49 carrying on its inner end a depending pallet consisting of a body 50 having a detent-pawl 51 extending from it across the plane of the ratchet-teeth 32 to engage therewith, and a similar detent-pawl 52 extending from it across the plane of the ratchet-teeth 33 to engage with them, thus forming a species of escapement. The pallet is connected from its detent 51 by a coiled spring 54 with a rigid pin 55 projecting horizontally from the adjacent side of the armature 13 near its free end; and the detent 52 is turned upwardly at its free end to form an abutment 53 extending across the plane of the pin 55 against undue turning of the pallet under the stress of the spring 54 and by which to turn the pallet for the purpose hereinafter explained when the armature is attracted by the magnet.

With the device in position on a machine with which it is to be used, the trip-arm 44 passes at its free end transversely through and is movable in the longitudinal slot in the coin-chute 56 of such machine, and is thus in the path of the coin-passage through the chute, which usually leads to a coin-receptacle (not shown); so that each time a coin is inserted into the chute it encounters and by its weight and momentum depresses the trip-arm to about a horizontal position, overcoming the resistance of the weight 43, the gravity of which returns the arm to its normal position after the inserted coin has rolled off it to continue its course through the chute, which is commonly widened or deflected toward its lower end to permit the coin to clear the trip-arm after having depressed it.

Reference to the diagram in Fig. 6 will facilitate understanding the description of the operation hereinafter contained:

The part represented at 57 is the contact-roller of the aforesaid patent, across which is fed the perforated music-sheet containing a perforation at the end of the piece of music cut in the sheet. This perforation is represented at 58 by a dotted indication on the roller in a position to register its path with a certain contact-finger indicated at 59. The circuit of a motor, indicated at 60, for driving the machine, proceeds from one side of a generator 61 by a wire *w* through the motor, whence it connects with the binding-post 30; and the generator is connected from its opposite side, by a wire *w*', with the finger 24. Therefore, when the spring 23 is separated

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from the finger 24, the motor-circuit is broken. The wire w is connected by a wire w^2 with the roller 57, and the contact-finger 59 is connected by a wire w^3 with the wires 27 and 28 which go to corresponding terminals of the magnet 12, the other terminals of which connect by the wire 26 with the finger 24. The armature-spring 14 tends to maintain the spring 23 in contact with the finger 24 to keep the motor-circuit closed throughout the playing of a piece by the machine; but when the piece is finished, the perforation 58 registers with the contact-finger 59 and connects the wire w^2 through the roller 57 with the finger 59, wire w^3 and finger 24 to the wire w^1, thereby energizing the magnet 12 to attract the armature and thus separate the spring 23 from the finger 24 with the result of opening the motor-circuit and stopping the motor. The momentum of the motor pulling the traveling music-sheet (which is perforated for playing a plurality of pieces, with a perforation 58 at the end of each piece) carries the perforation 58 beyond the finger 59, whereby the latter, after a piece is ended, is insulated by the sheet from the roller and the magnet is de-energized, immediately after it has been energized, to free the armature. The tongue 17 is then obstructed, however, by the shaft 19 in its path (unless the shaft-recess remains in registration therewith), thereby preventing the armature-spring 14 from engaging the contact-spring 23 with the finger 24, to again close the motor-circuit, until the shaft-recess 18 registers with the tongue to permit it to cross the shaft underneath the same.

The operation is as follows, with the parts of the device in the normal position represented in Figs. 1 and 2: When a coin trips the arm 44 in the manner described, its downward movement raises the weight 43. The bracket-finger 47 extends across and into the path of the weight, which, in rising, encounters the finger and turns the bracket and with it the shaft 19 to bring the recess 18 underneath and into registration with the armature-tongue 17 which, in the normal position of the shaft, is pressed by its spring against the back thereof (Fig. 2) and obstructs the armature against engagement of the contact-spring 23 with the finger 24. This depression of the trip-arm 44, moreover, turns the sleeve 45 and with it the crank-arm 46 to raise the pawl 48 into engagement with the uppermost ratchet-tooth 32 in its path, with the result of raising the ratchet-bar the extent of one tooth. While the ratchet-bar remains so raised, it obstructs the re-entry, by gravity, of the bracket-section 40 into the recess 34, thereby maintaining the shaft-recess 18 in the path of the tongue to permit the latter to pass through it. In the rise of the bar 31 the pallet-member 51, which is normally held by the spring 54 in resilient engagement with the teeth 32, permits a tooth below it to slip past it and thereupon be engaged underneath by the recoil of the spring to support the bar in its raised position, since the rise of the trip-arm retracts the lifting pawl after it has performed its function; and while the pallet-member 51 is turning away from the tooth 32, the member 52 is turned into engagement with the next-lower tooth 33 on the opposite side of the ratchet-bar, thus acting in the ordinary manner of the pallet in an escapement. If, during the playing of a piece, no additional coin is introduced into the chute to trip the arm 44, on completion of the piece, when the perforation 58 registers with the contact-finger 59, the magnet is energized to attract the armature and thus carry the tongue 17 through the recess 18 into position back of the stop or shaft 19, and the movement of the armature engages the pin 55 on it with the abutment 53 to throw the pallet-pawl 51 out of engagement with the ratchet-teeth 32 and permit the bar 31 to drop by gravity to its normal position. In attaining that position, the upper end of the ratchet-bar withdraws from obstructing the bracket-arm 40, permitting the bracket to turn that arm into the recess 34 thereby also turning the shaft 19 to the position represented in Fig. 2, wherein it removes the recess 18 out of registration with the tongue 17 and stops the latter to obstruct the return of the armature, under the force of its spring 14, preventing engagement of the spring 23 with the finger 24, and thereby, also, the bracket-finger 41 is again brought into the path of the weight 43. The parts are then in condition to be again actuated as described as the result of inserting another coin to trip the arm 44 and close the motor circuit and start the operation of the machine. In the event of inserting one, or a plurality of coins in succession, into the chute while the machine is still operating as the result of the first coin-insertion, each additional coin so inserted will trip the arm 44 and actuate the pawl 48 against a different tooth 32, once for each insertion, thereby raising the ratchet-bar farther and farther and continuing its obstruction to the dropping of the bracket-arm 44, so that the shaft-recess 18 remains in registration with the tongue 17 to permit the armature to engage the spring 23 with the finger 24, and close the magnet-circuit as the result of each such insertion. Each ensuing attraction of the armature engages the pin 55 with the pallet to release the ratchet-bar and permit it to drop the extent of one tooth, as already described; so that after the machine has operated as many times as the number of inserted coins, the bar will drop to its lowest position to admit the bracket-bar 40 into its recess 34 and turn the shaft 19 to obstruct the circuit-closing action of the armature until another

coin is inserted to produce starting of the motor for operating the machine anew.

The device is shown and hereinbefore described as depending for its operation on an electro-magnet, but that form is not the only one in which the invention may be embodied for causing a coin, by its insertion into a coin-operated machine to effect moving of a ratchet-bar, or analogous stop, into a position to prevent arresting the operation of the machine until the bar is returned to its initial position, which is the gist of the invention, the armature being merely one form of a member adapted to control the starting of the coin-operated machine under the action of the trip-arm.

What I claim as new and desire to secure by Letters Patent is—

1. In a coin-actuated device for the purpose set forth, the combination with a frame, of a stop-member and coin-tripped means whereby successively inserted coins may move the same by steps from an initial position through a series of different positions, means interposed between said member and the machine to be controlled, constructed and arranged to repeat the operation of said machine while said member is in any but its initial position, and means whereby the operation of the machine shall return said member by steps to its initial position.

2. In a coin-actuated device for the purpose set forth, the combination with a frame, of a stop-bar movably supported thereon, a weighted trip-arm oscillatorily mounted on the frame and adapted to extend across the coin-insertion passage of a coin-operated machine, raising means and supporting means for said bar operatively connected with the trip-arm, a member movably supported on the frame and constructed and arranged to control the starting of said machine, and releasable locking means for said bar operatively engaging with said trip-arm.

3. In a coin-actuated device for the purpose set forth, the combination with a frame, of a ratchet-bar movably supported thereon, a spring-controlled pallet co-operating with said bar, a weighted trip-arm oscillatorily mounted on the frame and adapted to extend across the coin-insertion passage of a coin-operated machine, a pawl for raising said bar operatively connected with the trip-arm, a member movably supported on the frame and constructed and arranged to control the starting of said machine, and releasable locking means for said bar operatively engaging with said trip-arm.

4. In a coin-actuated device for the purpose set forth, the combination with a frame, of a ratchet-bar vertically movable thereon and provided with a recess in its upper end, a spring-controlled pallet co-operating with said bar, a weighted trip-arm oscillatorily mounted on the frame and adapted to extend across the coin-insertion passage of a coin-operated machine, a pawl for raising said bar operatively connected with the trip-arm, a rock-shaft journaled on said frame, a bracket on said shaft having an arm to engage with said bar when raised and hold said shaft in one position and a finger extending into the path of said trip-arm, and a member movably supported on the frame and constructed and arranged to control the starting of said machine and releasably engaging with said shaft.

5. In a coin-actuated device for the purpose set forth, the combination with a frame, of an electro-magnet, a spring-controlled armature, a contact-finger in the path of the armature, a rock-shaft journaled on said frame and forming a releasable stop for said armature, a bracket on said shaft, a ratchet-bar vertically moveable on said frame, a weighted trip-arm oscillatorily mounted on the frame and adapted to extend across the coin-insertion passage of a coin-operated machine, a pawl for raising said bar operatively connected with the trip-arm, and a spring-controlled pallet co-operating with said bar and extending into the path of movement of the armature.

6. In a coin-actuated device for the purpose set forth, the combination with a frame, of an electro-magnet, a spring-controlled armature carrying a contact-member and provided with a stop-tongue, a contact-finger in the path of said member, a rock-shaft journaled on the frame and containing a recess to register with said tongue, a vertically-movable ratchet-bar, a bracket on said shaft engaging said bar when raised, a weighted trip-arm oscillatorily mounted on said frame, a pawl for raising said bar operatively connected with the trip-arm, and a spring-controlled pallet co-operating with said bar and extending into the path of movement of the armature.

7. In a coin-actuated device for the purpose set forth, the combination with a frame, of an electro-magnet, a spring-controlled armature carrying a contact-member and provided with a stop-tongue, a contact-finger in the path of said member, a rock-shaft journaled on the frame and containing a recess to register with said tongue, a vertically movable ratchet-bar, a bracket on said shaft engaging said bar when raised, a weighted trip-arm oscillatorily mounted on said frame and into the path of which the free end of said bracket extends, a pawl for raising said bar operatively connected with the trip-arm, and a spring-controlled pallet co-operating with said bar and extending into the path of movement of the armature.

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In the presence of—
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C. W. WASHBURN.