

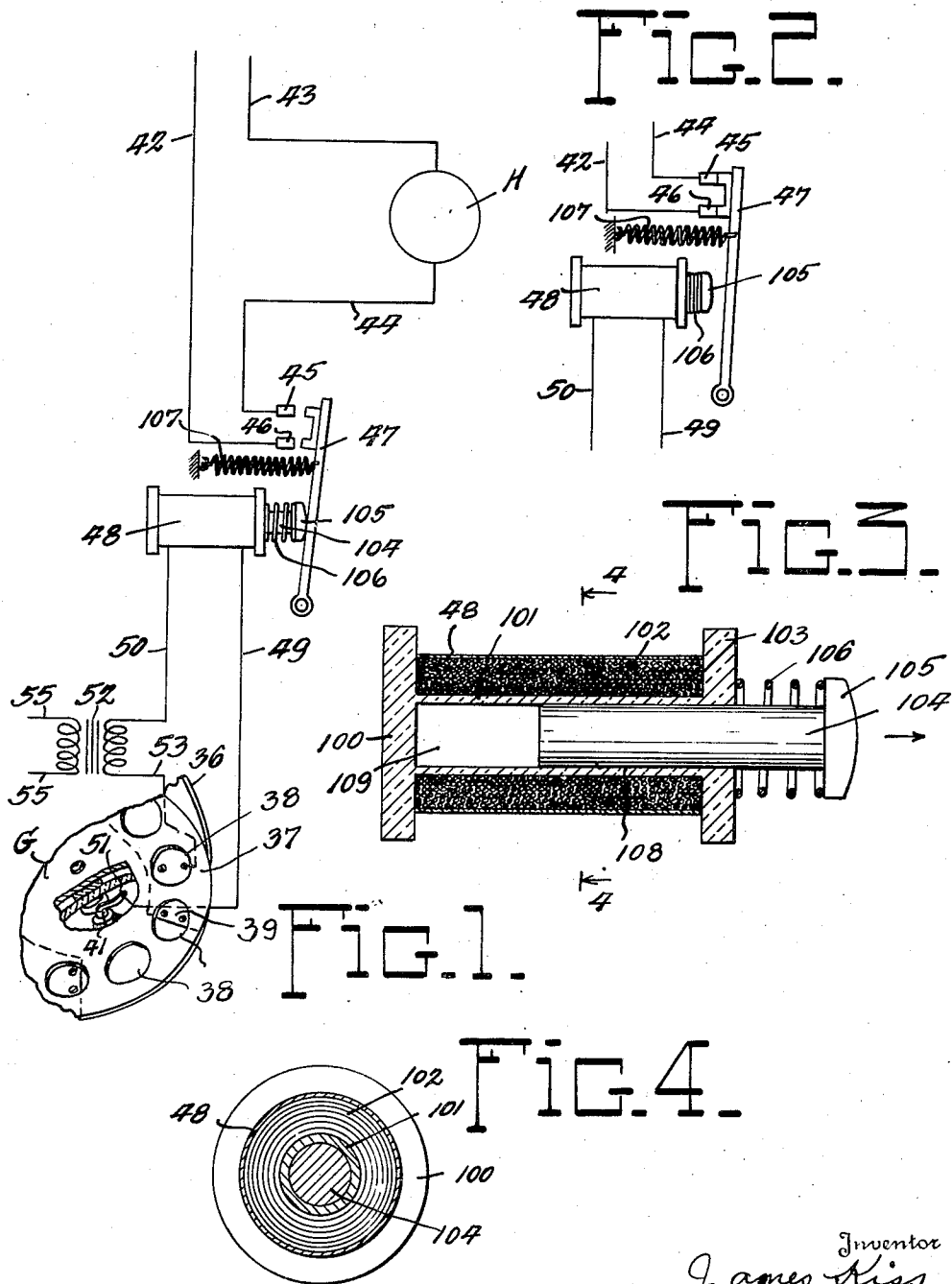
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J. KISS

2,222,713

COIN FEEDING MACHINE

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By

Inventor
James Kiss
Robt Robt

ATTORNEYS

UNITED STATES PATENT OFFICE

2,222,713

COIN FEEDING MACHINE

James Kiss, Bethlehem, Pa.

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1 Claim. (Cl. 133—3)

This invention relates to improvements in money paying machines, and more especially to improvements in coin feeding instrumentalities for such machines whereby the coins are fed to assorting instrumentalities which serve to assort the coins into their different denominations for delivery into suitable coin holders, from which the same may be ejected at will.

cut in case a coin fails to make good contact (such as might be occasioned by dirty coins) for a sufficient period of time to enable the operation of the coin feeding means until a better contact is established.

More specifically, the present invention contemplates the provision of a time delay relay for the coin controlled circuit of the motor driven coin feeding unit.

Other and further objects and advantages of the invention will be hereinafter described, and the novel features thereof defined in the appended claim.

In the drawing:

Figure 1 is a diagrammatic view of the electric circuits which control the motor driven coin feeding mechanism, said circuits having my new improvements embodied therein;

Figure 2 is a fragmentary view illustrating the time delay relay in an energized position and closing the driving motor circuit which is shown open in Figure 1;

Figure 3 is an enlarged longitudinal sectional view through the solenoid of the time delay relay, the same having a spring-pressed plunger associated therewith, and the plunger being shown in elevation; and

Figure 4 is a cross-sectional view taken approximately on the line 4—4 of Figure 3.

Like reference characters designate corresponding parts in the several figures of the drawing.

It will be understood that the coin feeding unit is of the same general type as disclosed in the aforementioned application, and for this reason the same will not be described in detail. In Figure 1 of the present application, I have shown a fragmentary part of the coin feeding unit designated G, and which includes a coin receptacle or hopper 36, which is provided at its bottom with a rotating plate 37 having a series of openings 38 formed therein and which are preferably all of the size of the largest coin (50¢ piece) intended to be handled by the disc 37. Beneath the rotary disc 37 is a stationary plate 39 of nearly complete circular form, both the plate 39 and the disc 37 being made of electrically conductive material. The disc 37 and the plate 39 are spaced apart so as to normally be out of electrical contact with one another. The disc 37 is mounted upon a drive shaft 41, which is driven by a motor H, and if desired, a gear reduction means may be availed of to reduce the speed of the disc 37 as compared with the driving speed of the motor H. The motor is arranged in an electrical circuit com-

The type of machine to which this invention primarily relates is disclosed in the pending application of James Kiss, which issued into Patent No. 2,170,288 on August 22, 1939. As disclosed in that application, the coin feeding mechanism is operable by a motor, preferably of the electrical type, and the motor is initiated and maintained in operation as an incident to the maintenance of a supply of coins in the hopper of the feeding unit. The operation of the motor is adapted to be automatically cut off when the supply of coins in the supply hopper or holder has been exhausted. Under these conditions, the motor which operates the coin feeding mechanism will not be operative save and except when there is work for the motor to do by way of actuating the feeding devices, thereby affording a saving of power or energy required to operate the machine, and also minimizing and eliminating undue wear.

The coin feeding unit preferably embodies a movable member having the form of a rotary disc driven by the motor referred to above, and electrical contact means cooperative with the movable member and disposed in a control circuit for the motor so that when coins are in the hopper of the feeding unit, the electrical contact means will be rendered effective to energize the motor.

The present invention embodies the same features generally referred to above, but is designed to make the coin feeding means more positive in its action and to otherwise improve upon the feeding operation. With the old feeding system as disclosed in the pending application hereinbefore referred to, it has been found that the control circuit for the driving motor which drives the rotary feeding disc would frequently open and close, and often remain open, thereby causing the feeding device to stop. This difficulty was largely caused by the fact that the coins would not always establish a good electrical contact which was essential to a satisfactory operation of the motor control circuit for the purposes intended.

In its broad aspect, the present invention has to do with a delay mechanism for the motor control circuit which delays the opening of the cir-

prising the line wires 42 and 43, the wire 43 leading to the motor at one terminal, and the other terminal of the motor being connected by a wire 44 to a contact 45 spaced from another contact 46 which is connected with the wire 42. A solenoid operated switch 47 is adapted to bridge and connect the contacts 45 and 46 in energizing the motor H. 48 designates the solenoid for actuating the switch 47, this solenoid being disposed in a separate electrical circuit which comprises the wires 49 and 50. The wire 49 is connected to the rotary disc 37 at the point 51, and the wire 50 is adapted to be connected to one terminal of the output side of a transformer 52, the other terminal of the transformer being connected to the stationary bottom plate 39 of the feeding unit by means of a wire 53, as shown at 54 in Figure 1 of the drawing.

The primary side of the transformer 52 is connected to a source of power by means of the line wires 55. The purpose of the transformer is to step down the voltage to about six or ten volts for the operation of the solenoid 48. This is to prevent liability of shock when a person touches the receptacle 36 of the feeding unit G were the high voltage delivered directly to the rotary disc 37 and stationary plate 39. The line wires 42, 43 may be connected directly to the higher voltage lines of a domestic or commercial power system. When the coins are disposed in the receptacle or hopper 36 of the feeding unit G, the coin or coins will drop into the openings 38 of the disc 37, thereby establishing contact between the stationary plate 39 and the rotary disc 37, under which conditions the circuit including the solenoid 48 is closed, energizing the solenoid and drawing the switch plate 47 to a position connecting the contacts 45 and 46 as shown in Figure 2. Thereupon, the motor circuit is closed, and the motor H remains in operation so long as there are any coins in the hopper 36 to drop into the openings 38 and establish an electrical conductive connection between the parts 37 and 39. It is understood that the hopper 36 is tilted or disposed at an inclination so that coins deposited therein will gravitate towards the lowermost portion of the disc 37, thus insuring that any single coin received in the hopper will ultimately drop into an opening of the disc 37 for establishing the conductive connection between the parts 37 and 39 to maintain the motor H in action so long as any coin remains in the hopper of the feeding unit G. The coins are carried in the openings 38 of the disc 37 until, during a certain point in the revolution of the disc 37, each coin reaches a discharge opening (not shown) and drops therethrough, whereupon the coins are preferably passed to an assorting unit which need not be described herein. As soon as the coins in the hopper 36 have been discharged, and no coin remains in the hopper to maintain contact between the parts 37 and 39, the circuit including the solenoid 48 is broken and the solenoid is deenergized, causing the switch plate 47 to move away from contacts 45 and 46, and thus open the motor circuit stopping the motor H immediately.

From the foregoing, it will be recognized that a dirty coin may cause the motor H to stop prematurely. To eliminate this objection, the solenoid 48 is closed at one end by a member 100, having a sleeve 101 extending through the winding 102 and terminating in a head 103 which is provided with an opening coaxial with the

sleeve. A plunger 104 of slightly less diameter than the sleeve 101 is mounted in the latter, the plunger being provided with an enlarged head 105 at its outer extremity. A spring 106 is interposed between the head 105 of the plunger 104 and the head 103 of the sleeve 101, thereby normally urging the plunger 104 to a position projecting substantially out of the sleeve, as will be best understood from reference to Figure 3 of the drawing. Now when the solenoid winding 102 is energized by the closing of the circuit responsive to establishment of contact between the parts 37 and 39 by the coins, as previously described, the plunger 104 is pulled inwardly against the pressure of the spring 106, permitting the switch plate 47 to move to its position which connects the contacts 45 and 46, thereby energizing the motor H. A light spring 107 (weaker than the spring 106) is preferably availed of to normally urge the switch plate 47 to its motor energized position.

Assuming the motor H is operating, it will continue to operate at least for a time, even though a coin does not make good contact with the parts 37 and 39 during the feeding of the coin, by reason of the coin being dirty or otherwise. This result is attained by reason of the fact that the plunger 104 tends to draw a vacuum behind the same and within the sleeve 101 as it is projected outwardly to the position of Figure 3 under the influence of the spring 106, when there is no current flowing through the solenoid winding 102. There is, however, a slight space 108 between the plunger 104 and the sleeve 101 which permits air to slowly leak past the plunger and gradually destroy the vacuum which the movement of the plunger tends to establish. The spring 106 is, of course, a comparatively weak spring so that it will not immediately overcome the vacuum effect in the space 109. As the spring gradually overcomes the vacuum as previously described, the head 105 of the plunger 104 ultimately engages the switch plate 47, so that further projecting movement of the plunger will rock the switch plate 47 against the pull of the spring 107, finally opening the contacts 45, 46, as shown in Figure 1 of the drawing. Thus any slight delay in the establishment of an electrical contact between the parts 37 and 39 of the coin feeding unit G will not interrupt the coin feeding operation of the unit, and there will be allowed sufficient time for the same or another coin to make a better or a new contact between the parts 37 and 39. Also, when the supply of coins in the hopper 36 of the feeding unit G has been completely depleted, the motor H will continue to operate the rotary disc 37 for a brief period (preferably ten to fifteen seconds, more or less) thereby making sure that there are no more coins left in the hopper 36. Of course, the time delay may be varied as desired, as by changing the strength of the spring 106 and/or the size of the air gap 108 around the plunger 104.

When the winding 102 of the solenoid 48 is energized, the plunger 104 is pulled inwardly at a rapid rate because of the great force of the electro-magnetic attraction which is created by the solenoid.

While the specific details have been herein shown and described, the invention is not confined thereto, as changes and alterations may be made without departing from the spirit thereof as defined by the appended claim.

Having thus described my invention, what I

claim as new and desire to secure by Letters Patent is:

In coin feeding apparatus of the class described, a coin hopper, a movable coin feeding
5 member in said hopper, means for operating said member to move the coins for feeding action thereof, an electric circuit operable upon closing

of the same by coins disposed in the hopper to effect the operation of the last mentioned means, and time delay means for temporarily maintaining said circuit closed to temporarily maintain the operation of the last mentioned means. 5

JAMES KISS.