June 23, 1964 A. R. BUCHHOLZ 3,138,166

CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed March 26, 1962 5 Sheets-Sheet 1

Fig. 1.

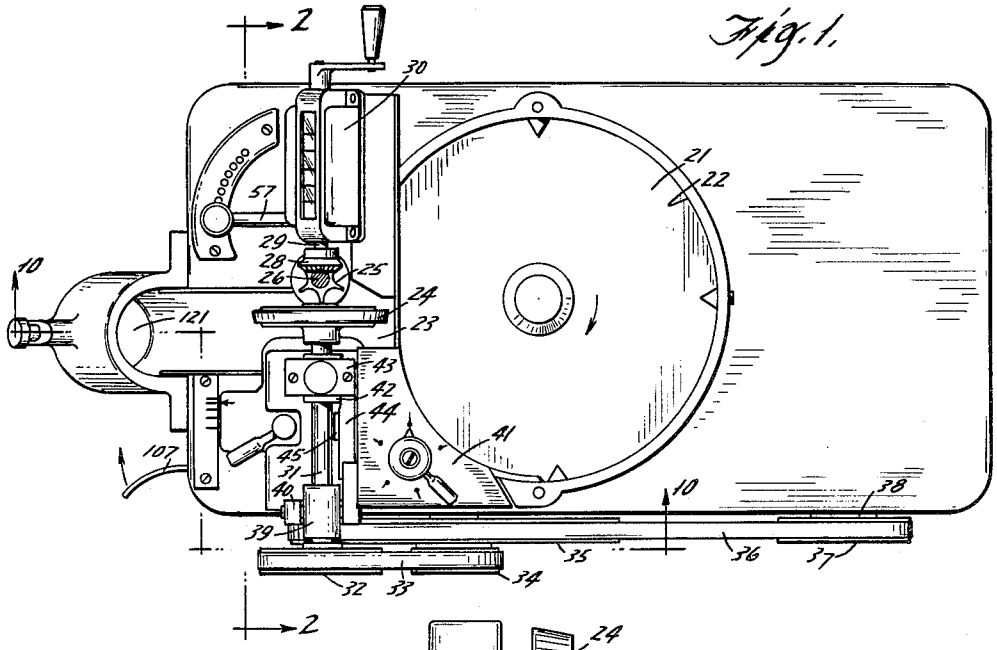
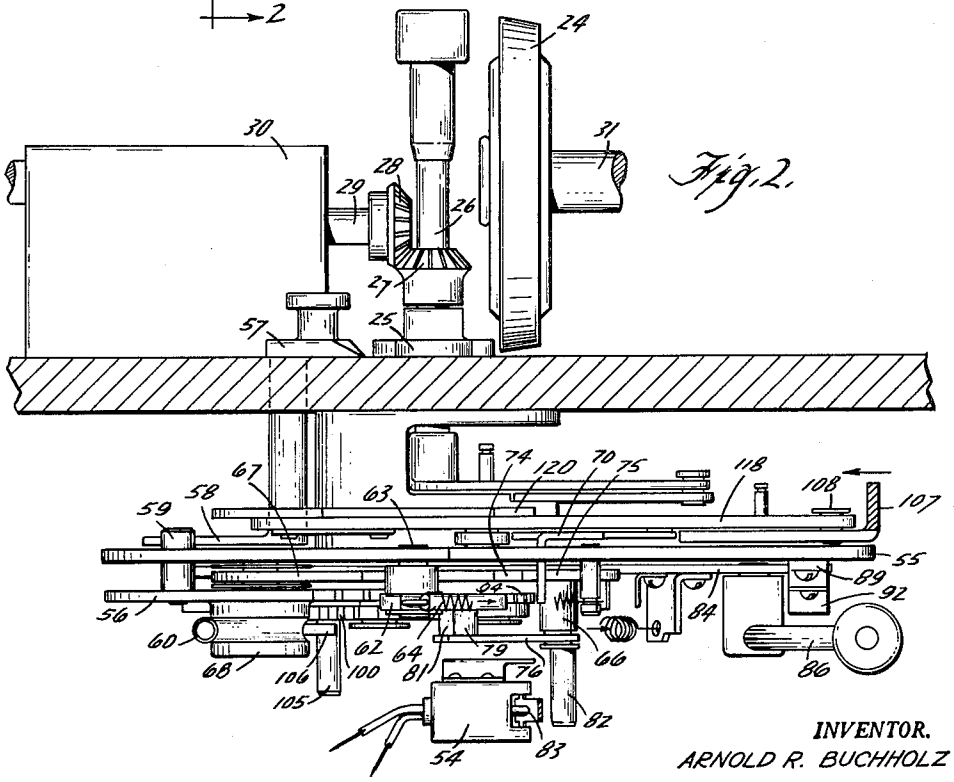


Fig. 2.



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CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed March 26, 1962 5 Sheets-Sheet 2

Fig. 3.

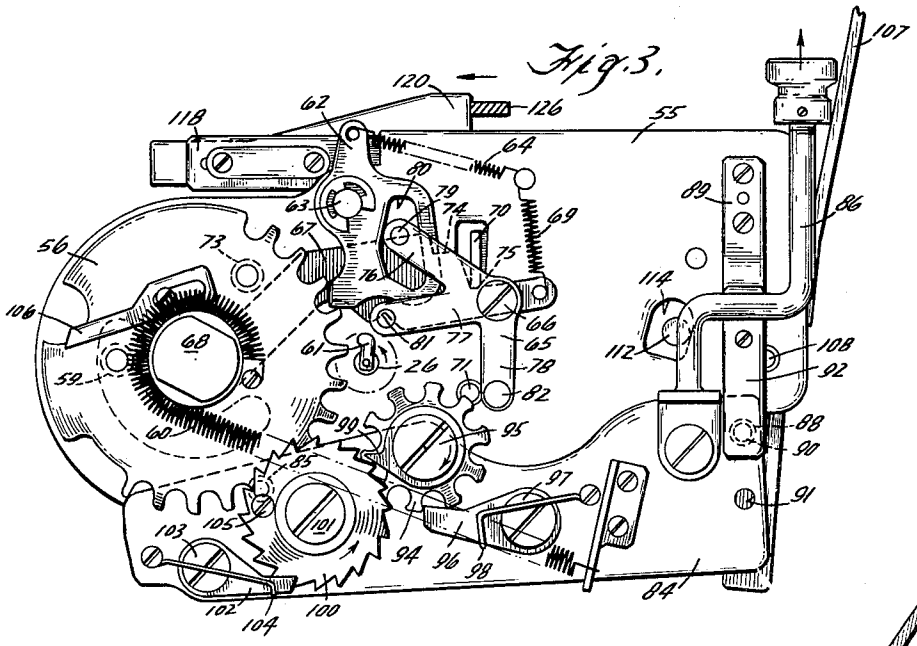
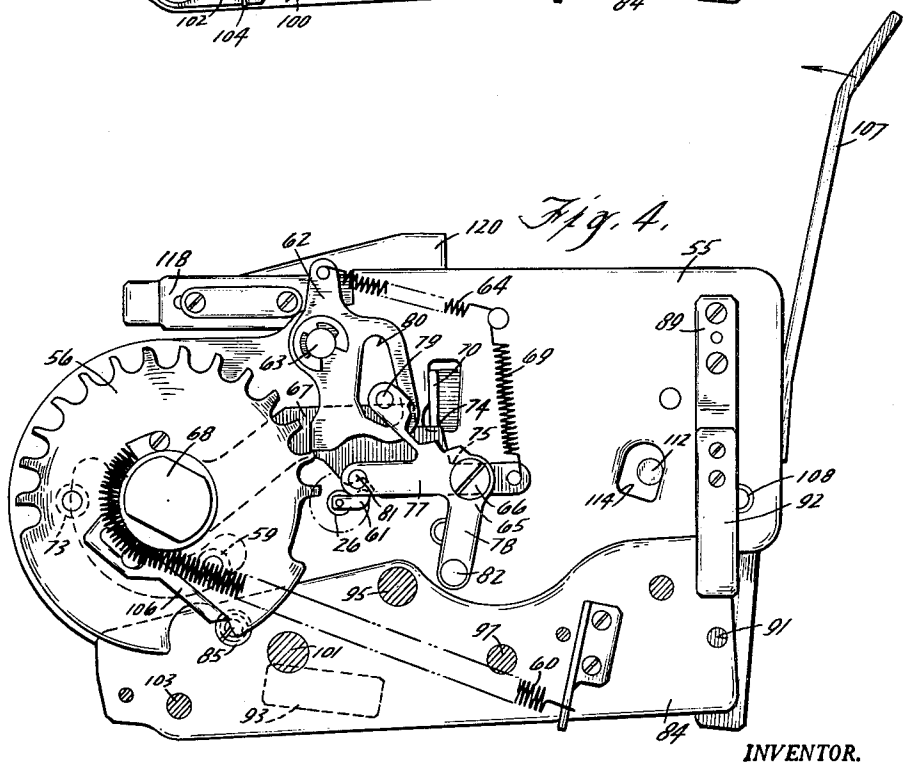


Fig. 4.



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CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed March 26, 1962 5 Sheets-Sheet 3

Fig. 5.

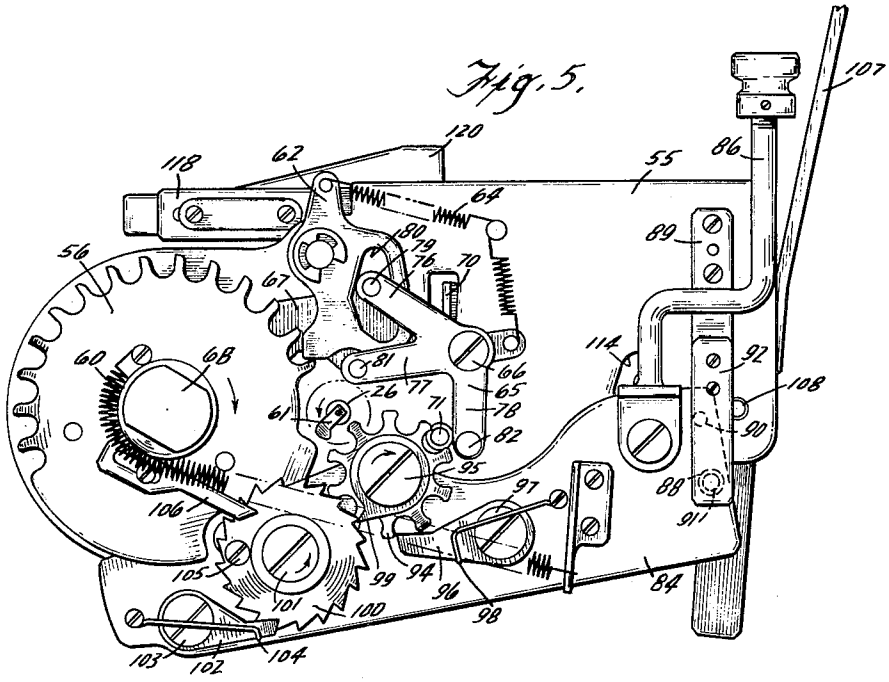
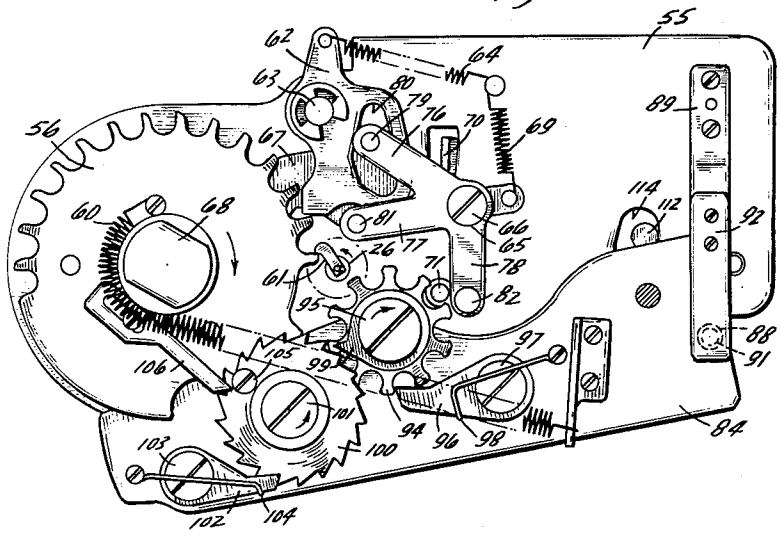


Fig. 6.



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June 23, 1964 A. R. BUCHHOLZ 3,138,166

CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed March 26, 1962 5 Sheets-Sheet 4

Fig. 7.

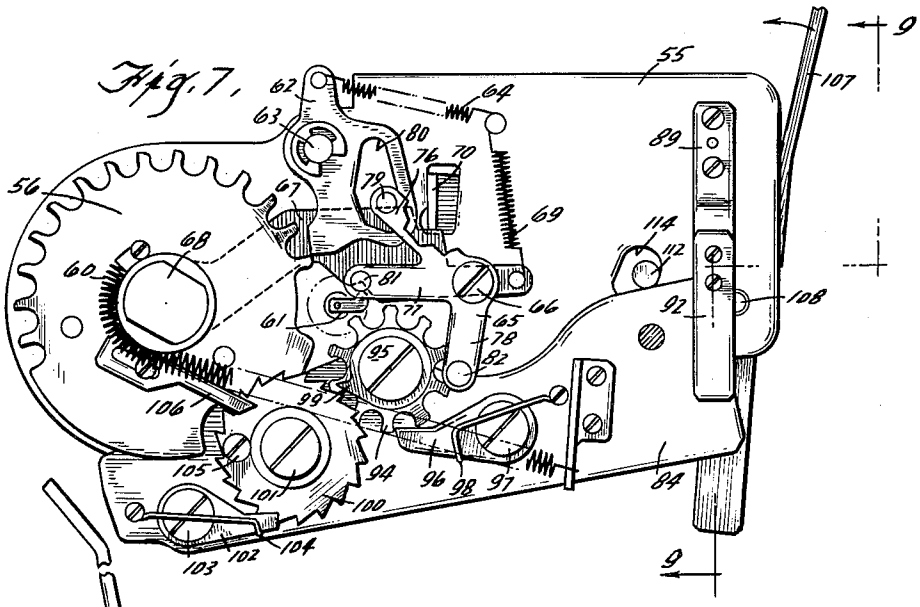


Fig. 8.

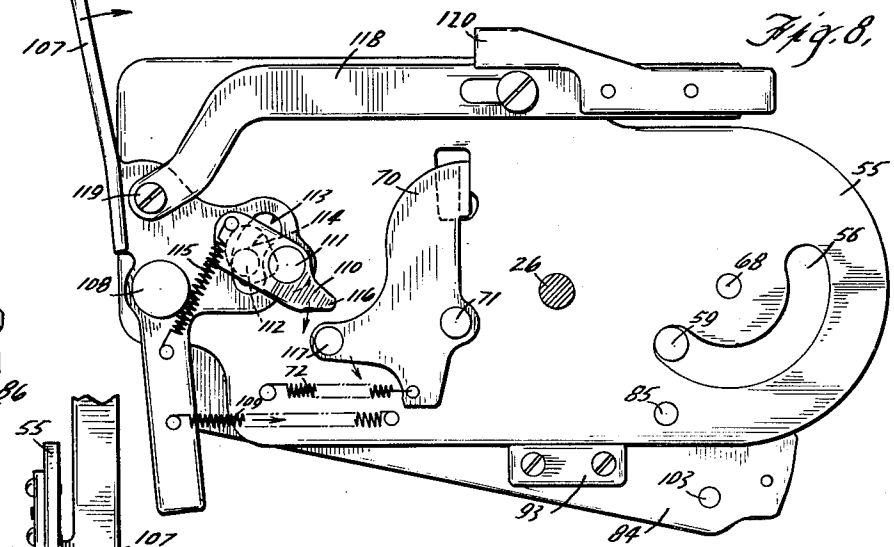
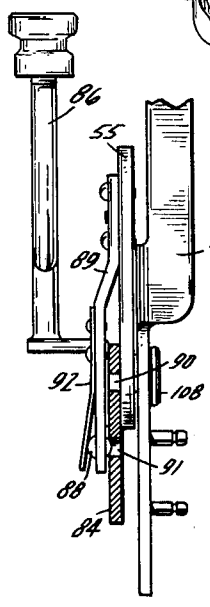


Fig. 9.



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CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed March 26, 1962 5 Sheets-Sheet 5

Fig. 10.

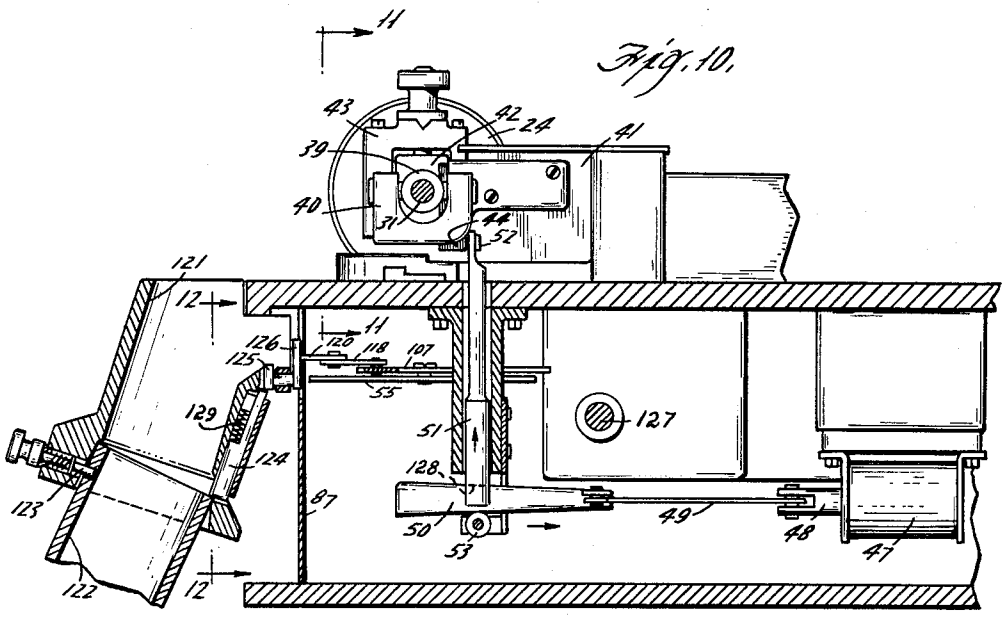
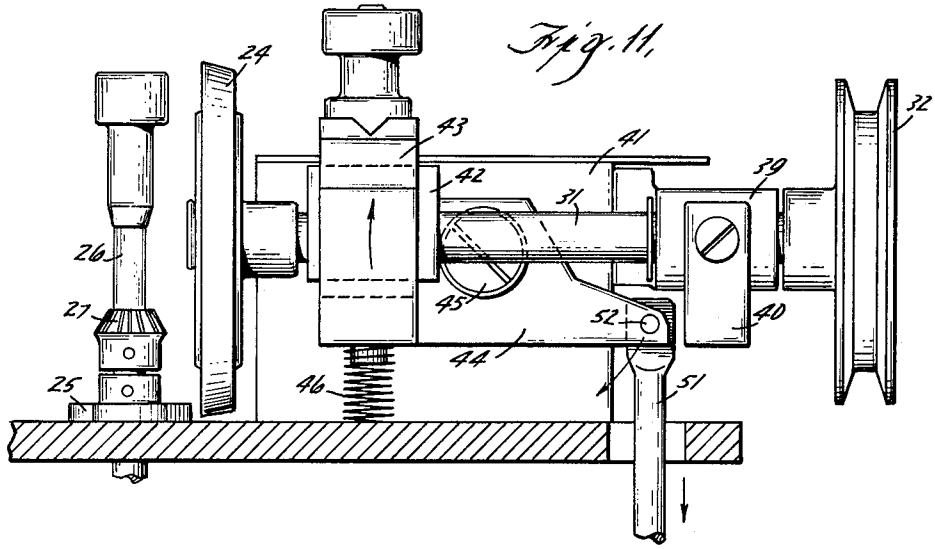


Fig. 11.



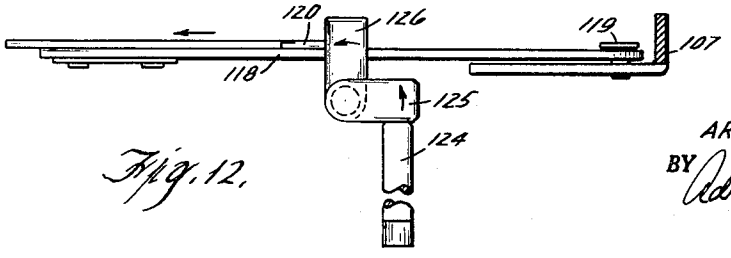


Fig. 12.

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United States Patent Office 3,138,166 Patented June 23, 1964

3,138,166

CONTROL MECHANISM FOR COIN COUNTING MACHINES

Arnold R. Buchholz, Watertown, Wis., assignor to Brandt Automatic Cashier Company, Watertown, Wis., a corporation of Wisconsin

Filed Mar. 26, 1962, Ser. No. 182,169
4 Claims. (Cl. 133—8)

This invention relates to a control mechanism for coin counting machines of the type which utilize a coin feed wheel by which coins are carried past and actuate a counter operating wheel, and more particularly to a mechanism for rendering the coin feed wheel inoperative at the end of a predetermined count of a small number of coins or at the end of a count of a large number of coins.

Coin counting machines of the type considered herein are employed to count a predetermined number of coins of a given denomination for packaging of the coins in paper wrappers or in bags. It is desirable to provide means in such counting machines to render the coin feeding apparatus inoperative automatically upon the completion of the count of the preselected number of coins. Control mechanisms of the type shown in U.S. Letters Patent No. 2,645,234, dated June 14, 1953, to Arnold R. Buchholz, have been utilized for the above function to render the coin feed wheel inoperative at the end of a predetermined count of a small number of coins, usually ten to fifty for packaging in paper wrappers, and also at the end of a large number of coins, usually a thousand coins for bagging operations. Such control mechanisms employ one coin registering means for the count of a small number of coins and a separate coin registering means for the count of a large number of coins, each of the means individually adapted to actuate a control member which renders the feed wheel inoperative.

The object of this invention is to provide an improved count control mechanism of simplified operation and construction in which the count of a large number of coins is completed through the count registering means for a predetermined small number of coins which in turn actuates a control member to render the feed wheel inoperative.

The foregoing and other objects and advantages of this invention will appear in the following description. In the description, reference is made to the accompanying drawings which form a part hereof and in which there is shown by way of illustration, and not of limitation, a specific embodiment wherein the invention resides.

In the drawings:

FIG. 1 is a top plan view of a coin counting machine with which the count control mechanism embodying the invention may be employed,

FIG. 2 is a view in vertical section taken in the plane of the line 2—2 of FIG. 1,

FIG. 3 is a bottom plan view of the count control mechanism showing it in one position,

FIGS. 4, 5, 6 and 7 are views similar to FIG. 3 showing the operating parts of the count control mechanism in other positions,

FIG. 8 is a top plan view of the count control mechanism,

FIG. 9 is an end view, partly in section, of the count control mechanism taken in the plane of the line 9—9 of FIG. 7,

FIG. 10 is a view in vertical section taken in the plane of the line 10—10 of FIG. 1,

FIG. 11 is a view in vertical section taken in the plane of the line 11—11 of FIG. 10, and

FIG. 12 is a view in vertical section taken in the plane of the line 12—12 of FIG. 10.

Referring to FIG. 1, the count control mechanism embodying the invention is preferably used with a counting machine of the type which includes a continuously rotating disc 21 which forms the bottom of a hopper defined by upstanding annular flange 22 and from which coins are carried by centrifugal force through an adjustable gate opening to a discharge channel 23 where they are engaged by a rubber feed wheel 24 and are forced thereby to engage a star wheel 25 to rotate the same. A star wheel 25 is mounted on a shaft 26 provided with a bevelled gear portion 27 which meshes with a bevelled gear 28 mounted on a shaft 29 for operating a conventional zero setting counter 30 (see FIG. 2).

Referring also to FIGS. 10 and 11, the feed wheel 24 is mounted on an extending portion of a shaft 31 which carries a pulley 32 connected by a belt 33 (see FIG. 1) with a pulley 34 on a shaft 127 carrying another pulley 35 which is connected by a belt 36 with a pulley 37 on a motor driven shaft 38. The shaft 31 is mounted in a rear bearing 39 (see FIGS. 10 and 11) pivotably mounted within a yoke 40 which is securely affixed to a coin gate housing 41. The shaft 31 is further mounted in a front bearing 42 carried within a box 43 formed as an integral part of a tiltable support 44 mounted to turn on a pivot shaft 45. A compression spring 46 is baised against the bottom of the box 43 to urge the feed wheel 24 upwardly away from a coin engaging position.

The feed wheel 24 is rendered operative to feed coins to the star wheel 25 by a mechanism which includes a continuous duty solenoid 47 which is normally energized when the counting machine is in operation. The plunger 48 of the solenoid 47 is provided with an extension 49 which terminates in a wedge shaped member 50 which rides in a slot 128 provided in the lower end of a vertically guided rod 51 mounted at its upper end on a shaft 52 secured to the tiltable support 44. The bottom surface of the wedge shaped member 50 rides on a roller 53 whereby energization of the solenoid 47 causes the member 50 to be drawn towards the solenoid 47 thereby forcing the rod 51 upwardly to move the feed wheel 24 to a coin engaging position. A normally closed switch 54 (see FIG. 2) is connected to the solenoid 47. The control mechanism hereinafter described operates the switch 54 to deenergize the solenoid 47 at the end of a count, but in the prior art and as shown in U.S. Letters Patent No. 2,378,828, dated June 19, 1945, to A. R. Buchholz and W. A. Barganz, instead of a tilting feed wheel 24 a clutch may be utilized between the pulley 32 and the shaft 31 and the control mechanism hereinafter described is also applicable to controlling the operation of such a clutch.

Referring to FIGS. 2 to 8, the control mechanism includes a frame 55 on which a rotatable ratchet wheel 56 is mounted. The ratchet wheel 56 may be moved to a predetermined set position by a setting lever 57 provided with an arm 58 (see FIGS. 1 and 2) which engages a pin 59 on the wheel. The setting of the lever 57 permits the counting of the coins in predetermined amounts from 10 to 50 and also permits an unlimited count for bagging operations. A coiled spring 60 urges the ratchet

wheel 56 in a counterclockwise direction in FIGS. 3–7, which provides spring bias for the setting of the ratchet wheel 56 by the lever 57. The ratchet 56 is advanced one tooth for every revolution of the coin actuated shaft 26 by a single toothed drive member 61 mounted at the end of the shaft 26, and is held against free rotation to a release position by a holding pawl 62 mounted on a pivot shaft 63 and urged toward the ratchet wheel 56 by a spring 64. The holding pawl 62 is controlled by release mechanism including a release lever 65 pivotally mounted on a shaft 66 which is secured to an extending end of a ratchet operated lever 67. The lever 67 is pivotally mounted on a shaft 68 which in turn is secured to the frame 55 and which further carries the ratchet wheel 56. The lever 67 is normally urged upwardly, as viewed in FIGS. 3–7, by a spring 69 to an upper position, relative to FIGS. 3 through 7, where it is locked and held by a latch 70 which is pivotably supported on a shaft 71 and held in locked position by a spring 72. Toward the end of any predetermined count whether large or small, a pin 73 mounted on the ratchet wheel 56 engages the lever 67 and swings it downwardly in a clockwise direction to a lower position as illustrated in FIGS. 4 and 7 where it is held by the latch 70. The lever 67 is provided with shoulder portions 74 and 75 which are engaged by the latch 70 to retain the lever 67 in its two positions. The release lever 65 is provided with three arm portions 76, 77 and 78. The arm 76 is provided with a pin 79 which rides in a slot 80 in the holding pawl 62. The arm 77 is provided with a pin 81 adapted to be engaged by the single toothed member 61 when the lever 65 is in a lower position (FIGS. 4 and 7). The arm 78 is provided with a pin 82 which is adapted to actuate switch 54 by engaging button 83 to open the normally closed contacts of the switch, and thereby to deenergize the solenoid 47.

The thousand count mechanism is mounted on a plate 84 which is pivotably mounted on a shaft 85 securely affixed to the frame 55. The plate 84 with its attached mechanism hereinafter described is adapted to be moved between an engaged and a disengaged position by a pull rod 86 which extends through a front wall 87 of the counting machine so that it will be accessible to an operator. The plate 84 is held in its two positions by a ball 88 retained in a bracket 89 attached to the frame 55 and which is received in respective holes 90 and 91 provided in the plate 84 (see FIG. 9). The ball 88 is biased towards the plate 84 by a strip spring 92 mounted on the bracket 89. When the plate 84 is disengaged, the ball 88 is received within the upper hole 90 to prevent complete withdrawal of the plate 84. When the plate 84 is engaged by an outward pull of the rod 86, the ball 88 is received in the hole 91 and a stop plate 93 prevents further upward movement of the plate 84.

A count multiplying gear wheel 94 is rotatably mounted on a shaft 95 secured to the plate 84 and is adapted to be engaged by the single toothed drive member 61 when the plate 84 is in an engaged position. For step by step rotation of the gear wheel 94 by the member 61, a holding pawl 96 is pivotably mounted on the plate 84 on a shaft 97 and urged to operative position by a spring 98. The gear wheel 94 has a single toothed member 99 secured to it for engagement with a ratchet wheel 100 pivotably mounted on a shaft 101 secured to the plate 84. For step by step rotation of the ratchet wheel 100 by the member 99, a holding pawl 102 is pivotally mounted on a shaft 103 secured to the plate 84 and urged to operative position by a spring 104. A pin 105 extends outwardly from the ratchet wheel 100 to engage an outwardly spaced arm 106 affixed to the ratchet wheel 56.

A reset and count start control lever 107 is pivotally mounted on the frame 55 on a shaft 108 and is normally urged to an inoperative position by a spring 109. Lever 107 has a latch release dog 110 pivotally mounted on a shaft 111. The dog 110 carries a pin 112 working in an arcuate slot 113 in the lever 107 and extending into a cam slot 114 provided in the frame 55. The pin 112 is urged normally against one side of the slot 114 by a spring 115. An extending end 116 of the dog 110 is adapted to engage a pin 117 on the latch 70 to release the latch 70 when the lever 107 is actuated. A push lever 118 is mounted at one end on a shaft 119 carried by the lever 107 and includes an outstanding portion 120. Coins leaving the star wheel 25 are carried through a discharge chute 121 to a discharge tube 122 which is suitably tiltably mounted upon a pin 123 so that it may be moved to engage a plunger 124 biased outwardly by a spring 129 and that acts on a crank member 125 which is suitably pivoted in the frame of the machine and has an arm 126 engageable with the outstanding portion 120 of the push lever 118 (see FIGS. 10 and 12).

To count coins in predetermined amounts from 10 to 50, the plate 84 and its attached mechanism is disengaged by forcing the pull rod 86 downward, relative to FIGS. 3–8, which will move the plate 84 into a position where the ball 88 is received in the hole 90 of the plate 84. With the plate 84 in its disengaged position as shown in FIGS. 3 and 4 the ratchet wheel 56 is set to the desired count by the setting lever 57. With the switch 54 in its normally closed condition, the solenoid 47 is energized thereby drawing the wedge shaped member 50 toward the solenoid and causing the rod 51 to be moved upwardly by the camming action of the member 50. Upward movement of the rod 51 rotates the tiltable support 44 counterclockwise against the action of the spring 46 to cause the feed wheel 24 to be moved downwardly into a coin engaging position. With the feed wheel 24 in its coin engaging position, coins are fed from the hopper 22 to be engaged by the feed wheel 24 which forces the coins against the star wheel 25. As the star wheel 25 is rotated by the passage of coins, the single tooth drive member 61 is rotated and engages the ratchet wheel 56.

The ratchet wheel 56 is advanced one tooth for every five coins that are passed by the star wheel 25 and in the construction being described, the member 61 advances the ratchet wheel 56 on the counts of 2 and 3, 7 and 8 and so on and not at the end of the counts of 5 to preset the release lever 65 to be acted upon by the member 61 when the predetermined count has been reached. Thus, as the second coin is counted the member 61 engages one of the teeth of the wheel 56 and moves the same sufficiently to swing the pawl 62 free. When this occurs, the wheel 56 is prevented from being returned under the force of the coiled spring 60 as the member 61 is in driving contact with the wheel 56. As the third coin is counted the spring 64 returns the pawl 62 to its holding position. If it be assumed that the control mechanism has been preset for a count of fifty coins, at the end of the count of the forty-sixth coin the members or parts will be in the position shown in FIG. 3. As the forty-seventh and forty-eighth coins are counted the member 61 engages the teeth of the wheel 56 thereby advancing the wheel 56 and causing the pin 73 to engage the lever 67 which is moved clockwise into its lower position where it is held by the latch 70. Movement of the lever 67 also moves the attached lever 65 to position the pin 81 in the path of the member 61. At the count of the fiftieth coin, the member 61 strikes the pin 81 thereby rotating the lever 65 and moving the pin 79 against a side of the slot 80 to swing the pawl 62 free so that the wheel 56 is returned to its initial position under the force of the coiled spring 60 and the members or parts will assume the positions shown in FIG. 4. Rotation of the lever 65 under the action of the member 61 also causes the pin 82 to engage and open the contacts of the normally closed switch 54 thereby deenergizing the solenoid 47. Deenergization of the solenoid 47 permits the rod 51 and tiltable support 44 to be

moved under the action of the spring **46** to withdraw the feed wheel **24** from a coin engaging position.

Before another predetermined count can be effected, it is necessary to reset the coin count control mechanism. This may be done manually by shifting the lever **107** from its normal position against the action of the spring **109** or by tilting the discharge tube **122** so that it forces the plunger **124** upward to rotate the crank member **125** thereby forcing the crank member arm **126** against the outstanding portion **120** of the push lever **118**. Both methods yield the same result in that the dog **110** is rotated in a clockwise direction relative to FIG. 8 so that the extending end **116** will engage the pin **117** of the latch **70** thereby rotating the latch **70** counterclockwise to release the latch **70** from engagement with the shoulder portion **74** which permits the levers **65** and **67** to move into their upper positions under the action of the spring **69**. With the lever **65** in its upper position, the switch **54** is returned to its normal closed condition thereby energizing the solenoid **47** to place the feed wheel **24** into a coin engaging position, as hereinbefore described.

By use of the setting lever **57** the ratchet wheel **56** may be placed in a bagging position, in which position the pawl **62** engages the first tooth of the ratchet wheel **56**. An unlimited count may be had in the bagging position since the member **61** cannot engage any of the teeth of the ratchet **48**.

To count coins in multiples of one thousand, the control mechanism is placed in the bagging position as described above and the plate **84** with its attached extended count mechanism is engaged by drawing the pull rod **86** outwardly from the counting machine. With the plate **84** engaged, the gear wheel **94** is positioned whereby it may be engaged by the member **61** as coins are fed past the star wheel **25** as shown in FIG. 5. The gear wheel **94** is advanced one tooth for each revolution of the member **61** and, since it carries ten teeth, it is rotated once for every fifty coins counted.

For each full revolution of the gear wheel **94**, the ratchet wheel **100** is advanced one tooth by the single tooth member **91** affixed to the wheel **94** (see FIG. 5). The ratchet wheel **100** is, therefore, advanced one tooth for every fifty coins counted, and since the ratchet wheel **100** has twenty teeth, it completes one full revolution for each one thousand coins counted. However, when the ratchet wheel **100** is rotated from its eigtheenth to its nineteenth tooth, or when the nine hundred fiftieth coin is counted, the pin **105** affixed to the wheel **100** engages the arm **106** secured to the ratchet wheel **56** as shown in FIG. 6. Thus, as the ratchet wheel **100** is moved to the nineteenth tooth, the ratchet wheel **56** is rotated to a position where the holding pawl **62** engages its second tooth, which is the same position as a setting for a predetermined count of fifty coins. During the count of the last fifty coins of the thousand coins, the coin registering mechanism which includes the ratchet wheel **56** is engaged by the member **61** in the same manner as described above for a predetermined count of fifty. As the nine hundred ninety-seventh and ninety-eighth coins are counted, the pin **73** secured to the ratchet wheel **56** will again engage the ratchet operated lever **67** to move the lever **67** to its lower position where it is engaged by the latch **70**. The lever **65** is moved to a position where the pin **81** is placed in the path of the member **61**. At the end of the count of one thousand coins, the member **61** engages the pin **81** thereby rotating the lever **65** and causing the pin **82** to open the normally closed switch **54**. Opening the switch **54** deenergizes the solenoid **47** and permits the feed wheel **24** to be moved upward and out of a coin engaging position. The member can no longer rotate since it is blocked by the pin **81** secured to the arm **77** of the lever **65**, and the members or parts are in the position shown in FIG. 7. Reset of the coin count control mechanism is carried out as hereinbefore described.

It will be apparent from the above description that the coin count control mechanism of this invention provides a simple and efficient mechanism for stopping the flow of coins once the predetermined count of a small or a large number of coins has been completed by utilizing the small coin count registering mechanism to complete the count of the large number of coins.

I claim:

1. In a coin counting machine having a driven coin feeding wheel, means for rendering said wheel operative to feed coins during a count, and control means to render said first named means inoperative at the end of a count, the combination of a control mechanism for said control means comprising a coin driven member, count settable registering means engageable by said coin driven member to operate said control means at the completion of a count of different predetermined small numbers of coins, said count registering means being also settable to a disengaged position relative to said coin driven member for extended count, extended count registering means engageable by said coin driven member and adapted to engage said first named count registering means when said first named count registering means is in said disengaged position to shift the same to an engaged position relative to said coin driven member toward the completion of a count of a large number of coins, and means to selectively engage and disengage said extended count registering means with said coin driven member.

2. In a coin counting machine having a driven coin feeding wheel, means to render said wheel operative to feed coins during a count, and control means to render said first named means inoperative at the end of a count, the combination of a control mechanism for said control means comprising a coin driven member, count settable registering means engageable by said coin driven member to operate said control means at the completion of a count of different predetermined small numbers of coins, said count registering means being also settable to a disengaged position relative to said coin driven member for extended count, extended count registering means adapted to be shifted between an inoperative position and an operative position in which it is engaged by said coin driven member and engages said first named count registering means when said first named count registering means is in said disengaged position to shift the same to an engaged position relative to said coin driven member when the count of a large number of coins has advanced to a preselected point whereby the completion of the count is effected by said first named count registering means, and means to shift said extended count registering means between its inoperative and operative positions.

3. In a coin counting machine having a driven coin feeding wheel, means to render said wheel operative to feed coins during a count, and control means including a shiftable member to render said first named means inoperative at the end of a count, the combination of a control mechanism for said control means comprising settable count registering means to operate said control means at the completion of a count of different predetermined small numbers of coins by controlling the position of said shiftable member, a coin driven member for operating said shiftable member when positioned in operative relation therewith by said count registering means at the end of a count to actuate said control means, said count registering means being also settable to an inoperative position relative to said shiftable member, extended count registering means for a count of a large number of coins, means for shifting said extended count registering means into operative relation with said coin driven member when said first named count registering means is in its inoperative position, and means included within said extended count registering means to shift said first named count registering means to an operative position relative to said shiftable member at a predetermined point near the end of a count of a large number of coins.

4. Control mechanism for the coin feed control of a coin counting machine comprising: a coin driven member; a settable first ratchet wheel selectively operable by said member and having a holding pawl releasable at the end of a predetermined count; release means for said pawl actuated by said first ratchet wheel; said first ratchet wheel being also settable to an inoperative position relative to said member for extended count, extended count registering mechanism shiftable between an operative and an inoperative position and including a second ratchet

wheel operable by said member when said mechanism is in said operative position and a count multiplying wheel operable by said second ratchet wheel to engage said first ratchet wheel when said first ratchet wheel is in said inoperative position to shift the same to an operative position relative to said member when a count of a large number of coins has advanced to a preselected point; and means for shifting said extended coin registering mechanism between said operative and inoperative positions.

No references cited.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,138,166 June 23, 1964

Arnold R. Buchholz

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, lines 14 and 34, for "count settable", each occurrence, read -- settable count --.

Signed and sealed this 27th day of October 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents