July 14, 1953 A. R. BUCHHOLZ 2,645,234

CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed Sept. 12, 1949 4 Sheets-Sheet 1

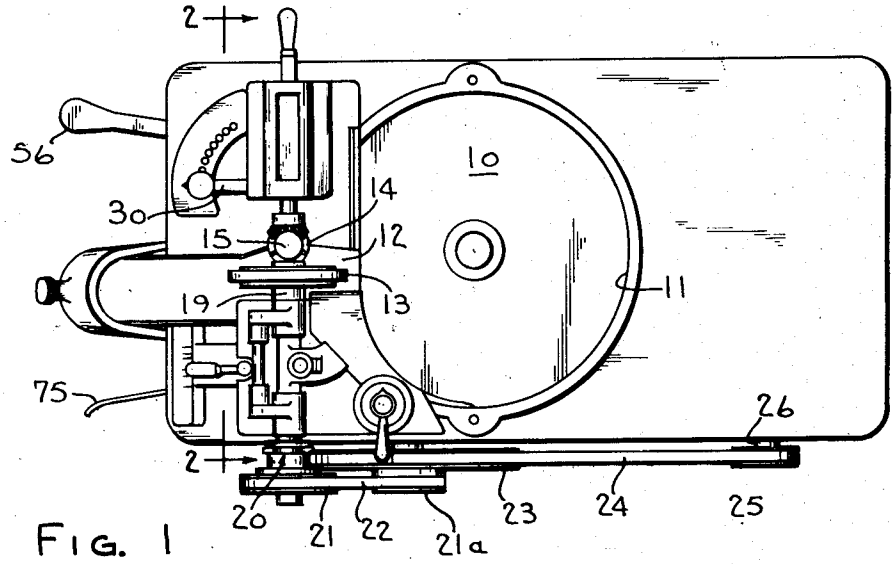


FIG. 1

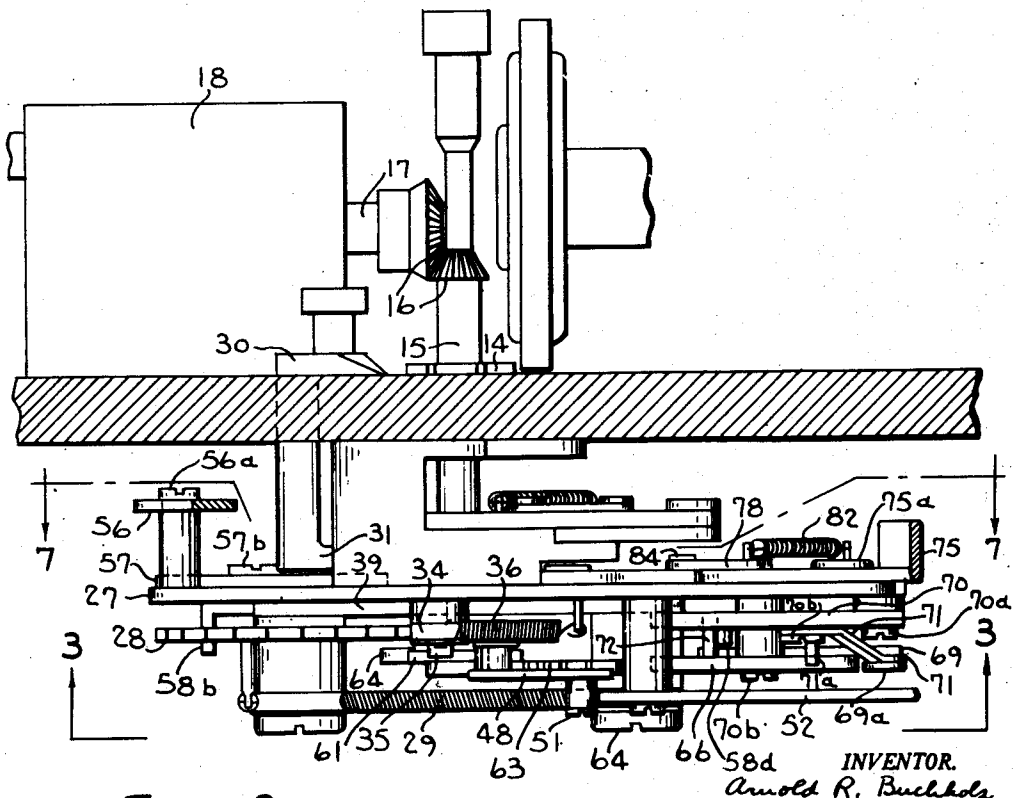


FIG. 2

INVENTOR.
Arnold R. Buchholz

BY

Charles & French
Att'ys.

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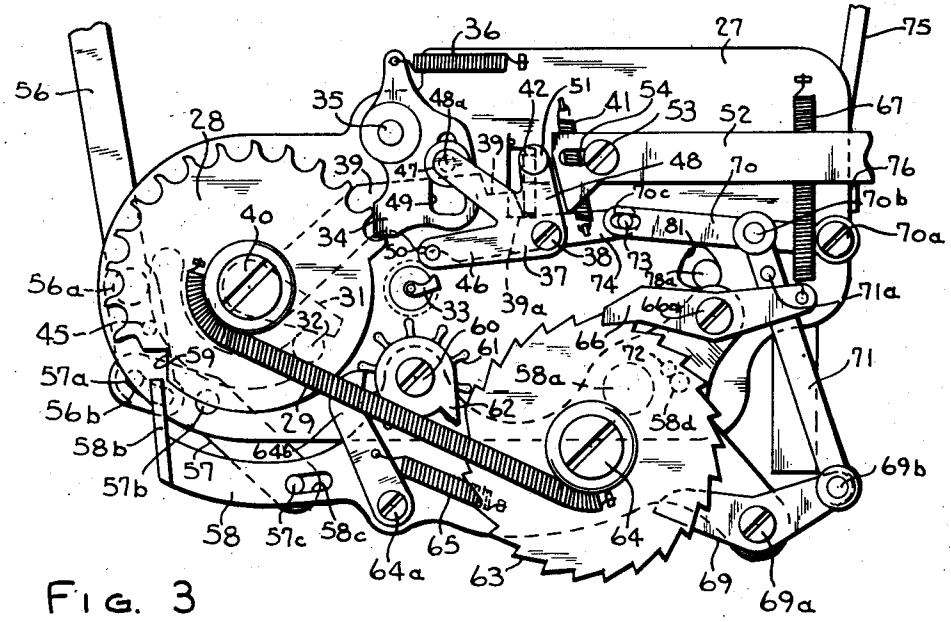


FIG. 3

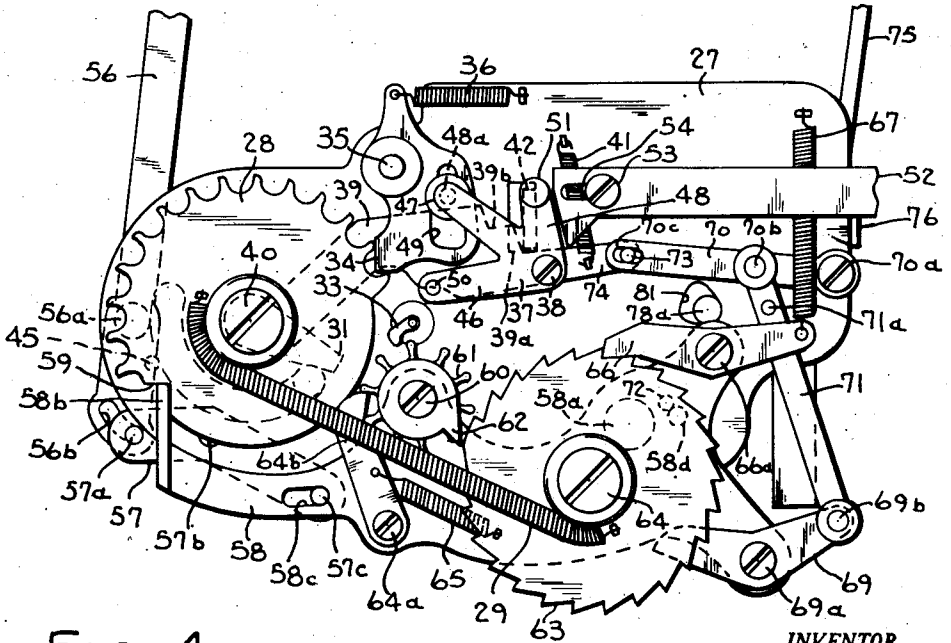


FIG. 4

INVENTOR.
Arnold R. Buchholz
BY
Charles J. French
Attys.

July 14, 1953 A. R. BUCHHOLZ 2,645,234

CONTROL MECHANISM FOR COIN COUNTING MACHINES

Filed Sept. 12, 1949 4 Sheets-Sheet 3

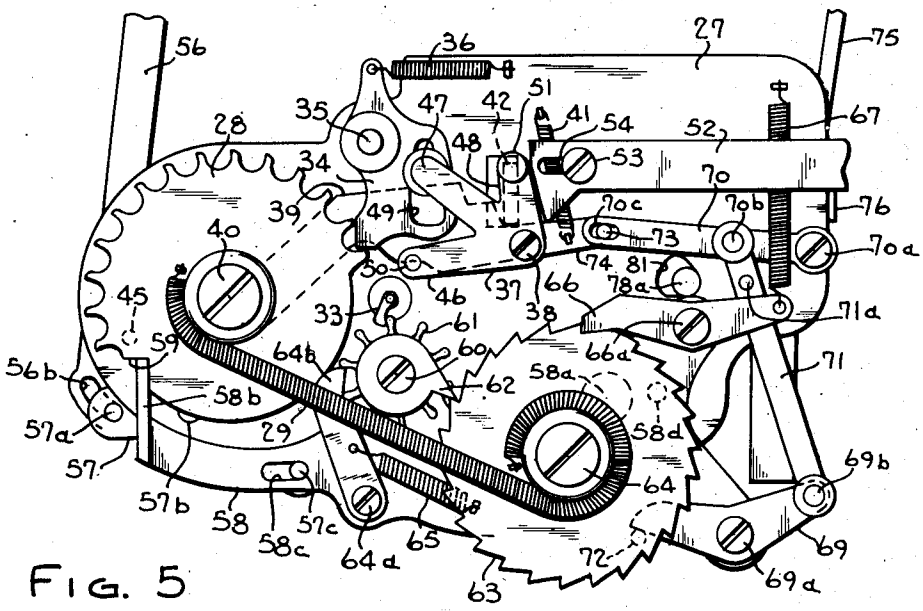


FIG. 5

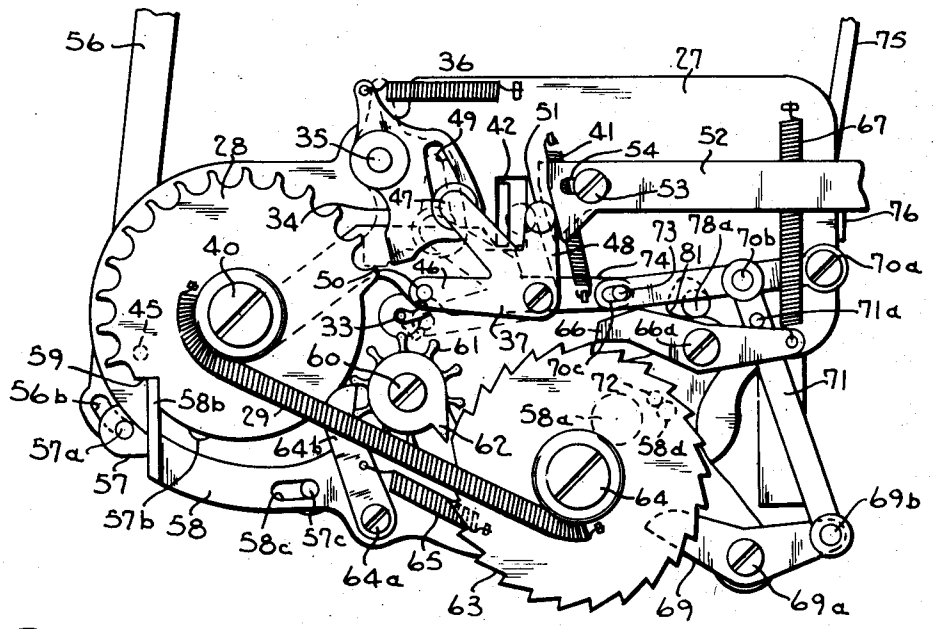


FIG. 6

INVENTOR.
Arnold R. Buchholz
BY
Charles & French
Att'ys.

July 14, 1953 A. R. BUCHHOLZ 2,645,234

CONTROL MECHANISM FOR COIN COUNTING MACHINES

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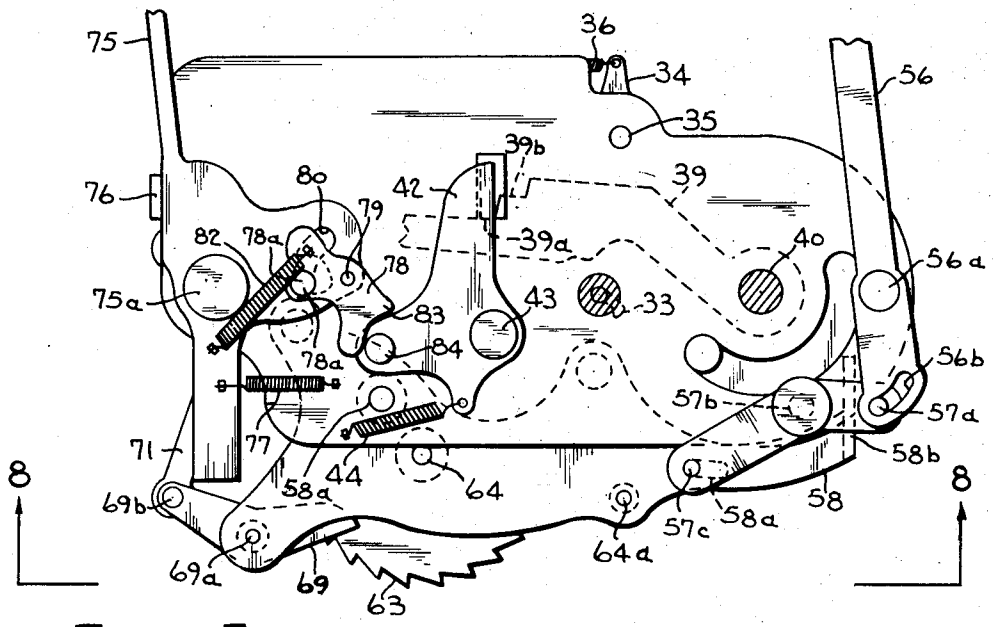


FIG. 7

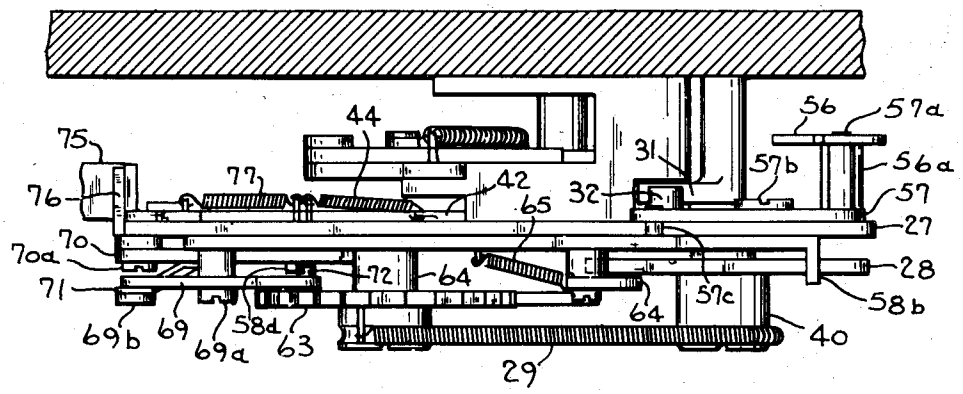


FIG. 8

INVENTOR.
Arnold R. Buchholz
BY
Charles J. French
Att'ys.

Patented July 14, 1953

2,645,234

UNITED STATES PATENT OFFICE

2,645,234

CONTROL MECHANISM FOR COIN COUNTING MACHINES

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

Application September 12, 1949, Serial No. 115,271

4 Claims. (Cl. 133—8)

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The invention relates to coin counting machines and more particularly to mechanism for controlling the drive of the coin feed wheel by which the coins are carried past and actuate a counter operating wheel.

The object of the invention is to provide a coin count control mechanism which in addition to the usual functions of automatically counting either an unlimited or predetermined small number of coins, usually from ten to fifty, will also automatically count a larger number of coins, for example, a thousand coins. More particularly, according to the invention, predetermined count mechanism which may be of the type shown in U. S. Letters Patent No. 2,378,828, dated June 18, 1945, to A. R. Buchholz and W. A. Barganz, has associated with it mechanism for counting a larger number of coins.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a top plan view of a coin counting machine in connection with which the count control mechanism embodying the invention may be used;

Fig. 2 is a vertical sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a bottom plan view as indicated by the line 3—3 in Fig. 2 of count control mechanism showing it in one position;

Figs. 4, 5, and 6 are views similar to Fig. 3 showing the operating parts of the count control mechanism in other positions;

Fig. 7 is a horizontal sectional view taken on the line 7—7 of Fig. 2;

Fig. 8 is a side elevation view as viewed from the arrows 8—8 of Fig. 7.

Referring to Fig. 1 and the aforesaid Patent No. 2,378,828, the counting machine in connection with which the control embodying the invention is preferably used includes a continuously rotating disk 10 forming the bottom of a hopper 11 and by which the coins are carried by centrifugal force through an adjustable gate opening to a discharge channel 12 where they are engaged by a rubber feed wheel 13 and engage a star wheel 14 to rotate the same. The wheel 14 is mounted on a shaft 15 connected by bevel gearing 16 with a shaft 17 for operating a conventional zero setting counter 18. Fig. 1 shows the feed wheel 13 mounted on a shaft 19 as in the aforesaid patent adapted to be connected through a clutch 20 with a continuously driven pulley 21 connected by a belt 22 with a pulley 21a on a

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shaft carrying another pulley 23 which is connected by a belt 24 with a pulley 25 on a motor driven shaft 26. The control mechanism hereinafter described controls the operation of the clutch 20, but in the prior art and in the copending application of Earl W. Quirk and Arnold R. Buchholz, for "Coin Counting Machine," filed September 12, 1949, Serial No. 115,272, instead of a clutch the feed wheel 13 may rotate continuously on a shaft which may be tilted to bring the feed wheel into and out of coin feeding relation and the control mechanism hereinafter described is also applicable to such structures.

Referring to Figs. 2 to 6, the control mechanism, as in the aforementioned patent, includes a frame 27 on which a rotatable ratchet wheel 28 is mounted, said wheel being rotated in one direction by a coiled spring 29 and being moved to a predetermined set position in the opposite direction by a setting lever 30 which has an arm 31 engageable with a pin 32 on said wheel 28, the setting of the lever 30 permitting the counting of coins in predetermined amounts from 10 to 50 and also permitting an unlimited count for bagging operations. The ratchet 28 is advanced one tooth at a time for every five revolutions of the coin operated shaft 15 by a single toothed drive member 33 mounted on said shaft 15 and is held against free rotation to a release position by a holding pawl 34 pivoted at 35 and urged to operative position by a spring 36. The pawl 34 is controlled by release mechanism including a release lever 37 pivotally mounted at 38 on the outer end of a ratchet operated lever 39 pivotally mounted on the shaft 40 mounted on the frame and carrying the wheel 28 and similar to the arm 59 of said patent. The lever 39 is normally urged upwardly by a spring 41 to an upper position where it is locked and held by a latch 42, see Fig. 7, pivoted at 43 and held in locked position by a spring 44. Toward the end of any predetermined count, a pin 45 on the ratchet wheel 28 strikes the lever 39 and swings it down from its upper position to a lower position in which it is again held by said latch 42, said lever 39 having shouldered portions 39a and 39b with which the latch 42 engages to hold it in its two positions. The lever 37 is a three armed lever and is provided with arms 46, 47, and 48. The arm 47 is provided with a pin 48a working in a slot 49 on the holding pawl 34. The arm 46 is provided with a pin 50 adapted to be engaged by the tooth member 33 in the lower position of the lever 39. The arm 48 is provided with a pin 51 for moving a count control member 52 which acts

through mechanism shown in the aforesaid patent to throw out the clutch 20 or to permit the tilt mechanism shown in the aforesaid copending application to tilt the feed wheel 13 to an inoperative position, said member 52 being guided on the frame 27 by a screw 53 working in a slot 54 in said member. In the upper position of the lever 39, the lever 37 is in a neutral position, and the pawl 34 is free to perform its holding functions as the tooth member 33 turns the ratchet wheel 28 for any predetermined count setting of said wheel. Near the end of the predetermined count, thep in 45 swings the lever 39 down to its lower position carrying the lever 37 with it to a position where the pin 50 may be engaged by the member 33. As the levers 37 and 39 are swung down to their lower position, and as the member 33 revolves, it strikes the pin 50 swinging the lever 37 clockwise to release the pawl 34 from the ratchet wheel 28 and move the control member 52 to a drive release position, the parts being then in the position shown in Fig. 6 or Fig. 11 of the patent. The mechanism is restored to its initial position by releasing the lever 39 from its lower locked position as hereinafter described. All of the above parts are similar to and operate in the same manner as those of the patent, and it is also to be noted that when the ratchet wheel 28 is in the position shown in Fig. 3, which is the bagging or unlimited count position, the tooth member 33 cannot turn said wheel so that the control mechanism is inoperative.

The present application starts with the ratchet wheel 28 in its bagging position, and when it is desired to count a thousand or other large number of coins at a time. Under these conditions a hand lever 56 pivoted intermediate its ends on the frame 27 at 56*a* has an arcuate slot 56*b* in which a pin 57*a* on a lever 57 is mounted. Lever 57 is pivoted on the frame 27 at 57*b* and acts when moved by the lever 56 to bring a supplemental frame member 58 pivoted on the frame member 27 at 58*a* into operative position in which a projection 58*b* on said frame 58 engages in a notch 59 in the ratchet wheel 28 to lock said wheel against movement, said lever 57 having a pin 57*c* engaging in a slot 58*c* in said frame 58. Rotatably mounted on a shaft 60 carried by the frame 58 is a count multiplying gear wheel 61 which in its operative position is disposed for actuation by the coin operated single tooth member 33, said wheel 61 also having a single tooth member 62 fixed thereto and adapted to engage a ratchet wheel 63 mounted on a shaft 64 carried by the frame 58. As previously noted, the counter registers a count of five coins for each rotation of the member 33, and for a thousand count the teeth of the gear 61 are advanced, one tooth at a time, by the member 33, and as there are ten teeth on this wheel 61, the counter will register a count of fifty coins for each revolution of the gear 61. On each revolution of the gear 61 and the tooth 62, the ratchet 63 will be advanced one tooth, and as there are twenty teeth on said ratchet available to be engaged by the tooth member 62 before the ratchet 63 is released, the counter will register a count of one thousand as the twentieth tooth of ratchet 63 is engaged by the tooth member 62.

For step by step rotation of the wheel 61, a ratchet or holding pawl 64*b* is pivotally mounted on the frame 58 at 64*a* and urged to operative position by a spring 65. For step by step rotation of the ratchet wheel 63, a holding pawl 66 is pivotally mounted on the frame 58 at 66*a* and urged to operative position by a spring 67. A spring 29 anchored at its ends to the ratchets 28 and 63 performs the double function of returning both of these ratchets to their initial position since only one of these ratchets turns at any one setting of the mechanism, and the other is locked and forms a fixed anchor for said spring.

In order that the same levers 37 and 39 may be used with the larger number count mechanism, means are provided for moving the lever 39 down from its upper position shown in Fig. 3 to its lowered position shown in Fig. 6 under the control of the ratchet 63 comprising levers 69 and 70 and a link 71. The lever 69 is pivotally mounted intermediate its end on the frame 53 at 69*a*, and one end projects into the path of movement of a pin 72 on the ratchet 63 while the other end 69*b* is pivotally connected to one end of the link 71. In the release position the pin 72 on ratchet 63 engages a fixed pin 58*d*. The lever 70 is pivotally mounted at one end 70*a* on the frame 27 and is operatively connected intermediate its ends at 70*b* to the other end of the link 71. The outer end of the lever 70 has a slot 70*c* in which a pin 73 on the extended end 74 of the lever 39 works. The link 71 carries a pin 71*a* which at the end of the count movement of ratchet 63 engages the pawl 66 to move it to a release position as shown in Fig. 6, and in this position the lever 37 has also been moved clockwise, in the same way as in registering a predetermined count by the ratchet 28, to shift the control member 52 to a drive wheel throw-out position.

For resetting the mechanism to start the count a reset and count start control lever 75 is pivotally mounted on the frame 27 at 75*a* and normally urged to an inoperative position against a stop 76 by a spring 77. Lever 75 has a latch release dog 78 pivotally mounted thereon at 79 which dog carries a pin 78*a* working in an arcuate slot 80 in the lever 75 and extending into a cam slot 81 in the frame 27, and normally urged against one side of said slot 81 by a spring 82. The end 83 of the dog 78 is adapted to engage a pin 84 on the latch 42 to release said latch when at the end of the registry of a count the lever 39 is in its lower position and the latch 42 is engaging the shoulder 39*b*.

With the above arrangement, for controlling the count of a large predetermined count number of coins such as a thousand or more or less but larger than any count effected through the ratchet 28, ratchet wheel 28 is set in the position shown in Fig. 3 which normally is a bagging position or unlimited count, and the lever 56 is then shifted to bring the projection 58*b* into locked position with the ratchet 28 and move the frame 58 inwardly to a position in which the coin operated member 33 may act on the teeth of wheel 61 as shown in Fig. 4. In this position the control member 52 is in a position that does not interfere with the drive of the feed wheel 13 either through the clutch 20 or through the tilting of the feed wheel shaft in said application to a coin feed position, and consequently the coins from the hopper 11 delivered into the passage 12 are carried by the star wheel 14, and as each coin engages and passes said wheel 14 it makes a fifth of a revolution. As the machine continues to operate the member 33 is advanced until it engages one of the teeth of the wheel 61 and advances it one-tenth of a revolution. In this manner after fifty coins have passed the

wheel 14, the tooth 62 moves into engagement with one of the teeth of the ratchet 63 and advances this wheel one tooth. As the operation continues, the ratchet 63 is advanced until the tooth 62 engages the nineteenth tooth of the ratchet 63, then as the tooth 62 moves the wheel 63 from its nineteenth tooth to its twentieth tooth, the pin 72 engages the lever 69 as shown in Fig. 5, and as the tooth 62 continues to move clockwise from this position, moving the ratchet 63 anti-clockwise, the pin 72 shifts the lever 69 clockwise pulling outwardly from its end 69*b* on the link 71, and thereby pulling the lever 70 inwardly, as viewed in Fig. 5, thus swinging the arm 39 to what has been termed as lower position in which the lever 37 is then in the dotted line position shown in Fig. 6 ready to be swung upwardly by the tooth member 33 as the thousandth count is completed. The full line position shown in Fig. 5 is the position of the parts on about the count of 998. Between 998 and 1000 the member 33 shifts the lever 37 upwardly to cause the arm 48 and its pin 51 to shift the control member 52 to a drive stop position for the wheel 13 that is either to throw out the clutch 20 as in the patent or to permit the shaft 19 for said wheel to be tilted to an inoperative position as in said application. Also as the arm 39 is pulled downwardly to its lower position by the lever 70, the link 71 moves down until the pin 71*a* strikes the pawl 66 which is released from the ratchet 63 as the 999th coin passes the star wheel 14, thus releasing the ratchet 63 which under the action of the spring 29 swings back to its initial position, the parts then being in the position shown in Fig. 6. The next large predetermined count is begun when the parts are restored to the initial position shown in Figs. 3 and 4 by shifting the reset or count start control lever 75, the latch 42 is released from the shoulder 39*c*, and the spring 41 then carries levers 39 and 37 to their upper position where it is again latched by engagement of the latch 42 with the shoulder 39*a*. As these levers 39 and 37 move up as above described, lever 39 through its connection with lever 70 swings this lever up and pulls upwardly on link 71 and lever 69 so that the pin 71*a* moves out of engagement with the pawl 66 and the mechanism is back to the position shown in Fig. 4 ready to begin another operation.

It will be noted from the above that operation of the ratchet wheel 28 moves the lever 37 to a position for its operation by the member 33 so as to operate the control member 52 at the end of any predetermined count of a small number of coins and that the operation of the ratchet wheel 63 moves the same lever 37 to a position for operation by the member 33 to operate the control member 52 at the end of a predetermined count of a large number of coins so that the lever 37 is a common operating member for both the counts determined by the ratchets 28 and 63 and operates the control member 52 whether a small predetermined count number or a larger predetermined count number of coins is desired, and it is also to be remembered that the control member 52 acts to control the operation of the means

for driving the wheel 13 by rendering said means inoperative to feed coins.

The expressions "upwardly" and "downwardly" "upper" and "lower' are used only relatively to explain the operation since actually, as shown in Figs. 2 and 3, the control mechanism is mounted in a generally horizontal position.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the appended claims.

What I claim as my invention is:

1. In a coin counting machine having a driven coin feeding wheel, means to render said wheel operative to feed coins during a count, a control member to render said means inoperative at the end of a count, settable count registering means to operate said control member at the completion of a count of different predetermined small numbers of coins, a shiftable member whose position is controlled by said count registering means for operating said control member and 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 member, said count registering means being also settable to an inoperative position relative to said shiftable member, the combination of count registering means for a count of a large number of coins, means for shifting said last named registering means into operative relation with said coin driven member when said first named registering means is in inoperative position, cooperative means between said shifting means and said first count registering means for preventing the operation of either registering means when the other is in operative position, and means operated by said second named registering means for also positioning said shiftable member in operative relation with said coin driven member at the end of the large number coin count to actuate said control member.

2. The structure as defined in claim 1 wherein the second named registering means comprises a ratchet wheel and a count multiplying gear operatively connected to said ratchet wheel and engageable with said coin driven member in the operative position of said second named registering means.

3. The structure as defined in claim 1 wherein the means for preventing the operation of either of said registering means includes a locking member on said means engageable with said first named count registering means when said second named count registering means is shifted into operative relation with said coin driven member.

4. The structure as defined in claim 1 wherein a single spring is used to return both count registering means to a count starting position.

ARNOLD R. BUCHHOLZ.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,128,561	Webendorfer	Feb. 16, 1915
2,378,828	Buchholz	June 19, 1945