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HOPPER DISCHARGE FOR COIN COUNTING MACHINES

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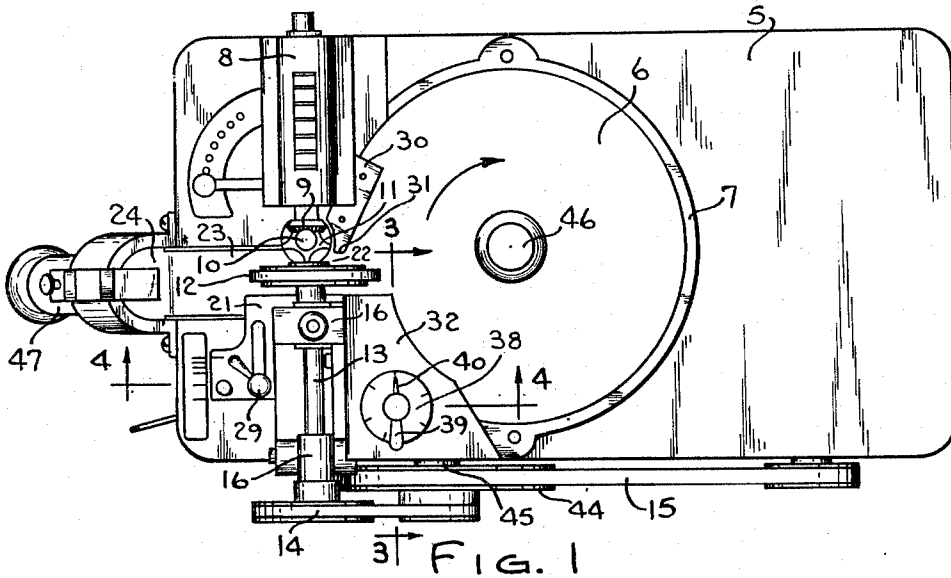


FIG. 2

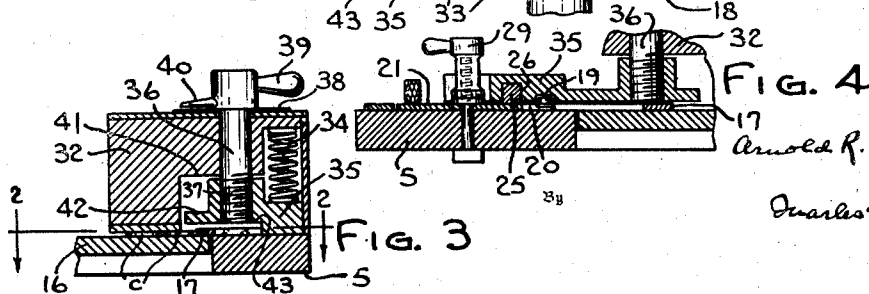
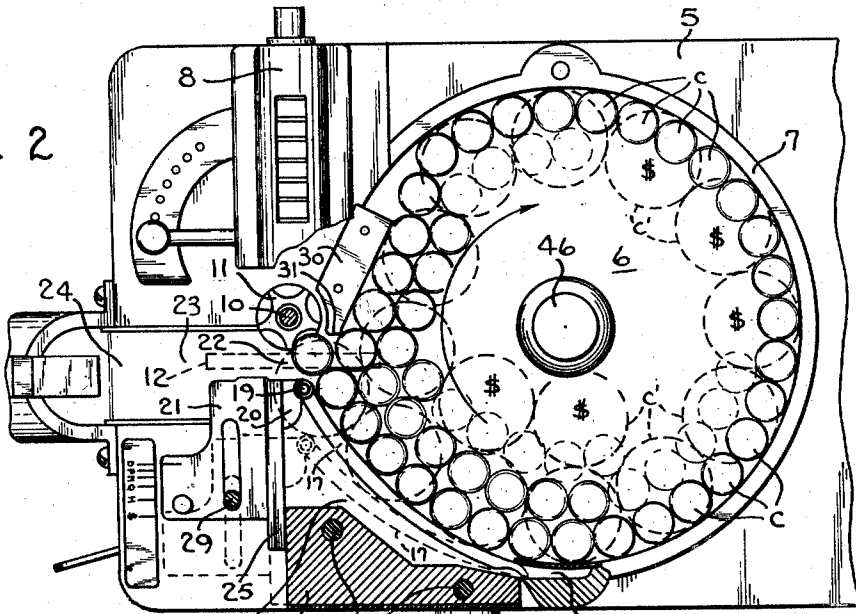


FIG. 4

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## UNITED STATES PATENT OFFICE

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## HOPPER DISCHARGE FOR COIN COUNTING MACHINES

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1 Claim. (Cl. 133—8)

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The invention relates to coin counting machines and more particularly to coin counting machines of the type having a hopper provided with a rotary bottom plate by which coins deposited in the hopper are carried out to the peripheral portion of the plate by centrifugal force and delivered through discharge passage means from the hopper to a discharge chute and past a star wheel which is driven by the coins and is connected by gearing with a counter mechanism.

In the prior patent to Arnold R. Buchholz and Walter A. Barganz, for "Coin Counting Machines," No. 2,378,828, dated June 19, 1945, a coin counting machine of the type above described is shown and described. In this machine as the coins were carried around the bottom disk or plate, they passed under a vertically adjustable height gauge at one side of the machine and were carried along beneath this gauge to an outlet passage having a feed wheel and a star wheel associated therewith and were arrested against further circular movement by the bottom plate by a stop or point member of considerable width which projected over the bottom of the hopper in advance of the feed or ejector wheel and acted to direct the coins to this wheel. With this arrangement, the coins were not fed directly to the star wheel from the hopper so that its positive drive by a coin was assured, and the point or stop member did not direct the coins in the hopper in a way to provide a substantially continuous spiral flow of coins to the discharge outlet so the rate of feed was slowed down by coin interference.

The object of the present invention is to provide a new and improved hopper discharge arrangement by which coins of any denomination are fed to the counter-actuating star wheel in a continuous spiral path and the point or stop member is brought as close as possible to the star wheel, so that the coins are fed directly to the star wheel and may never hit the point as they are carried past the star wheel by the feed or ejector wheel. As a result, the feeding of the coins past the counter is speeded up and is more uniform. A feature which contributes to the success of this discharge method is an adjustable back stop at the outlet of the hopper which is preferably carried on the gauge associated with the discharge passage and adjustable to regulate the width of this passage between it and the star wheel to the particular size of coin denomination being counted.

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

In the drawings:

Fig. 1 is a top plan view of a coin counting machine embodying the invention;

Fig. 2 is a view similar to Fig. 1 with parts

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broken away and parts being shown in section along the line 2—2 of Fig. 3;

Fig. 3 is a detailed sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a detailed sectional view taken on the line 4—4 of Fig. 1.

Referring to the drawings, the casing or housing 5 has a plate or disk 6 rotatably mounted therein and forming the bottom of a hopper 7. A counter 8 is mounted on the top of the housing and has a bevel gear connection 9 with a shaft 10 carrying a star wheel 11. A feed wheel 12 is mounted on a shaft 13 and driven continuously from a motor, not shown, by belt and pulley drives 14 and 15. The shaft 13 is journaled in bearings 16 which are tiltably mounted on a height gauge block for movement of the wheel 12 into and out of a coin feeding position, all as more particularly shown and described in my co-pending application Serial No. 221,709, filed April 18, 1951, for "Coin Counting Machine." In some instances in this art the feed wheel 12 is intermittently driven from its drive motor through a releasable clutch mechanism controlled by the count control mechanism, as for example, as shown in the prior U. S. Patent No. 2,438,822, dated March 30, 1948, to E. W. Quirk and A. R. Buchholz. In either case the feed wheel is rendered intermittently active to feed coins past the star wheel 11 so as to rotate the same to operate the counter.

The present invention is concerned with the discharge of coins from the hopper and a directed feed to the star wheel. According to this invention, a slot is formed in a part of the side of the hopper and the back wall of this slot is formed in part by an adjustable coin guide member 17 which at its free end works in a recess 18 in the side wall of the hopper and at its other end 19 is pivotally mounted on a boss 20 forming part of a horizontally slidable gauge plate 21 which forms a side of the coin or delivery opening 22 from the hopper and cooperates with the star wheel 11 and a bottom member 23 to form an adjustable entrance to a discharge passage 24. The gauge plate 21 is slidably mounted on the top of the housing and guided by a tongue 25 welded thereon working in a groove 26 in part 35. It is clamped in adjusted position by a clamping screw 29 having threaded engagement with said housing.

A guide member 30 adjacent the star wheel 11 is secured to fixed frame parts so as to overhang a portion of the hopper adjacent the opening 22 so as to deflect a second row of coins C from the discharge opening 22 and cause them to move in a continuous spiral path. This member 30 has a point 31 disposed close to the star wheel with the center of this point disposed in line with the projected circular periphery of

the bottom plate 6 with the result that the coins C in the first row are fed directly to the star wheel and may never hit the point 31 as they are carried, one at a time, past the star wheel by the feed or ejector wheel 12. As a result of the direct feed of the coins from the hopper to the star wheel and the offsetting of the coin flow of the second row of coins beyond the opening 22 by the guide member 30, the feeding of coins past the counter is speeded up and the rate of feed is more uniform. Fig. 2 of the drawings shows in full the path taken by coins C, such as dimes, while the plate 6 is rotating and coins C', such as dollars, are indicated in dotted.

The top wall of the slot in the hopper adjacent the opening 22 is formed by a height gauge 32 which is suitably vertically slidably mounted on guide posts 33 mounted in the frame and is normally urged upwardly by a spring 34 interposed between a frame part 35 and said gauge as shown in Fig. 3. A height adjusting screw 36 has its threaded shank adjustably mounted in a threaded hole 37 in the part 35 and extends loosely through the gauge 32 and an index plate 38 thereon which under the action of the spring 34 engages the head of the screw 36 which has a handle 39 and an index pointer 40 secured thereto. The gauge 32 has a recess 41 adjacent the projecting end 42 of the part 35 which also has a recess 43 therein forming part of the slot heretofore referred to in connection with the guide member 17. It will be noted from Fig. 3 that the entrance end of this side slot in the hopper which connects with the delivery opening 22 is formed between the disk or plate 6 and the gauge 32 and that the guide member 17 is disposed in part within the recess 43 and forms the effective back wall of said slot. Turning of the screw 36 relative to the part 35 adjusts the height of the gauge at the entrance opening to the slot to allow coins of different denominations and hence different thicknesses to be counted, it being noted that coins of only one denomination are handled at any one time and that the adjustment for the width or diameter of coins of any one denomination is taken care of by the inward or outward adjustment of the gauge 21 which also shifts the guide member 17 as previously described. The guide member 17 and gauge 21 are shown in the full line position for counting dimes and in the dotted line position for counting dollars.

With the above construction, the gauges 21 and 32 having been adjusted for the particular denomination of coins to be counted, the motor is started to rotate the plate 6 through any suitable driving connection therewith, as for example, the belt drive connection 15 including the pulley 44 mounted on a shaft 45 which as shown, for example, in Figs. 2 and 3 of Patent No. 2,438,822, has a skew gear drive connection with the shaft here designated 46 which carries the plate 6. The coins C are deposited in the hopper 7 and carried around by the plate 6 and the lower layers of coins are moved outwardly toward the sides of the hopper by centrifugal force and are carried around in a spiral path as shown in Fig. 2. The outer row of coins move in under the gauge 32 and guided by the member 17 are carried to the discharge opening 22 and fed one at a time to the star wheel 11. On the operation of the starting means for the count control which may be of the types shown in Pat-

ents Nos. 2,378,828 or 2,438,822, or any other suitable control means, the feed wheel 12 is rendered operative to feed the coins past the star wheel 11 to operate the counter 8 to register the number of coins passing along the discharge passage 24 to a delivery chute 47.

While the guide member 17 is shown as moved to its denomination adjusted position by the movement of the gauge 21, and this is the preferred construction, it is to be noted that this guide member could, without departing from the spirit of this invention, have its own separate adjustment, and that it is this guide member and not the gauge 21 that insures the feed of the coins directly to the star wheel 11.

It will be noted from Fig. 2 that the guide member 17 is curved so that its pivoted end at 19 is considerably offset from the end that works in the recess 18 so as to spirally offset the outer row of coins as they travel along this guide member to the outlet opening 22 and that adjacent this opening part of the coin surface is riding on the frame part adjacent the bottom plate 6.

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 claim.

What I claim as my invention is:

In a coin counting machine, the combination with a discharge passage at its front end, a coin operated counter drive star wheel at the entrance end of said passage and a coin feed wheel for feeding coins into said passage past said star wheel, of a coin supply hopper provided with a rotary bottom member by which coins deposited in said hopper are carried out towards its periphery by centrifugal force, said hopper having a discharge opening connected with the entrance end of said passage, the entrance end of said passage including a block linearly adjustably movable toward and away from said star wheel, a single arcuate-shaped guide member pivotally connected at one end directly to said block on a line disposed within the laterally projected area of said star wheel and extending at one side of said bottom member and forming at this side the effective outer wall for a single row of coins adjacent said discharge opening for guiding this row of coins on said bottom member directly to the star wheel and the feed wheel and into the entrance end of said discharge passage, and a pointed guide member overhanging said bottom member adjacent the discharge opening with its pointed end disposed directly in the rear of said star wheel but out of contact with a coin in the outer row then contacting said star wheel so that coins in the outer row do not normally contact this pointed member before contacting the toothed portion of said star wheel, the point having a side extending rearwardly from the entrance of said passage and acting to deflect the coins in the second row of coins in the hopper passing said discharge opening away from said hopper wall and spirally from the outer row of coins passing along said first named guide member.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

| Number    | Name                  | Date          |
|-----------|-----------------------|---------------|
| 1,529,105 | Albrecht et al. _____ | Mar. 10, 1925 |
| 2,437,721 | Barganz et al. _____  | Mar. 16, 1948 |