March 27, 1934. H. B. MYERS 1,952,563

COIN HANDLING MECHANISM

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Fig. 1.

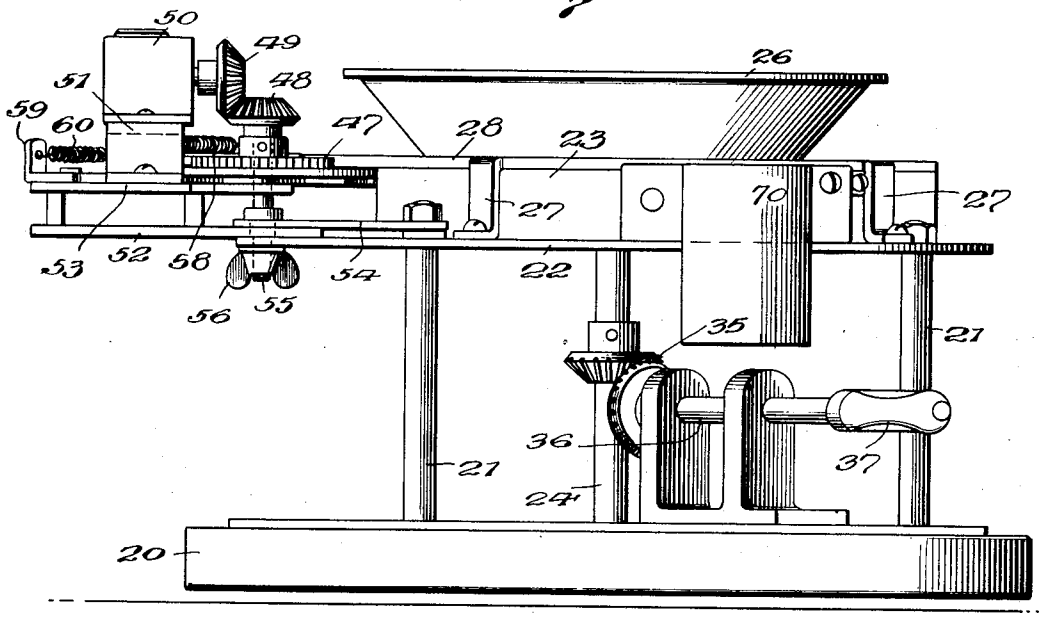


Fig. 7.

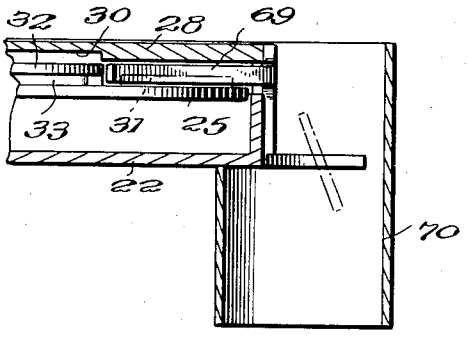


Fig. 8.

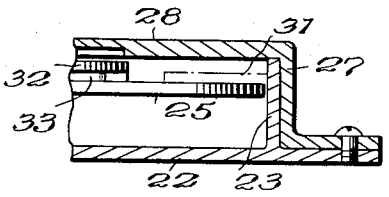
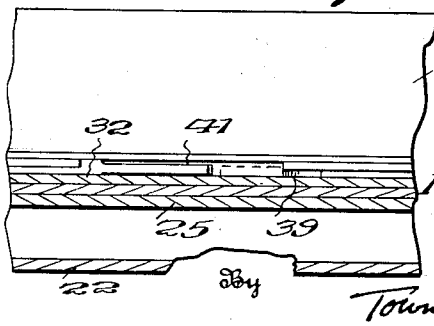


Fig. 9.



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COIN HANDLING MECHANISM

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Fig. 2.

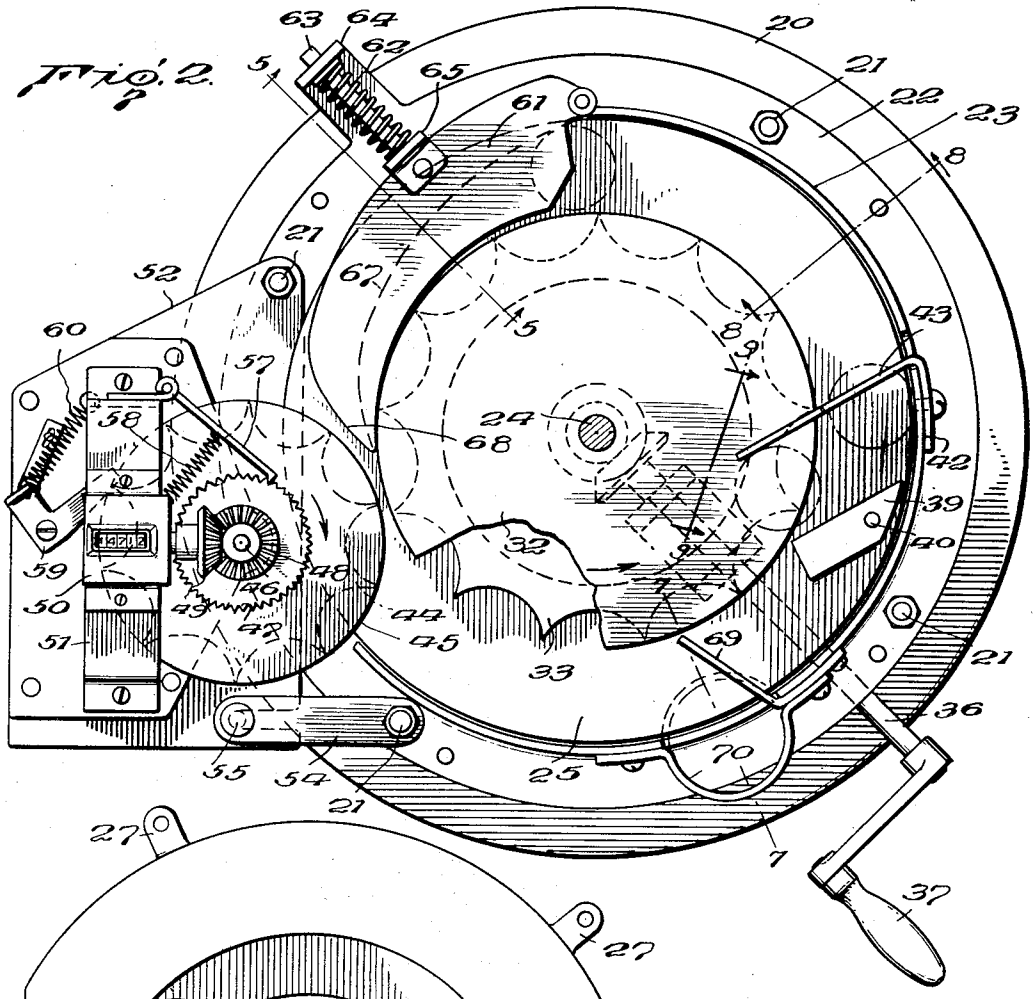
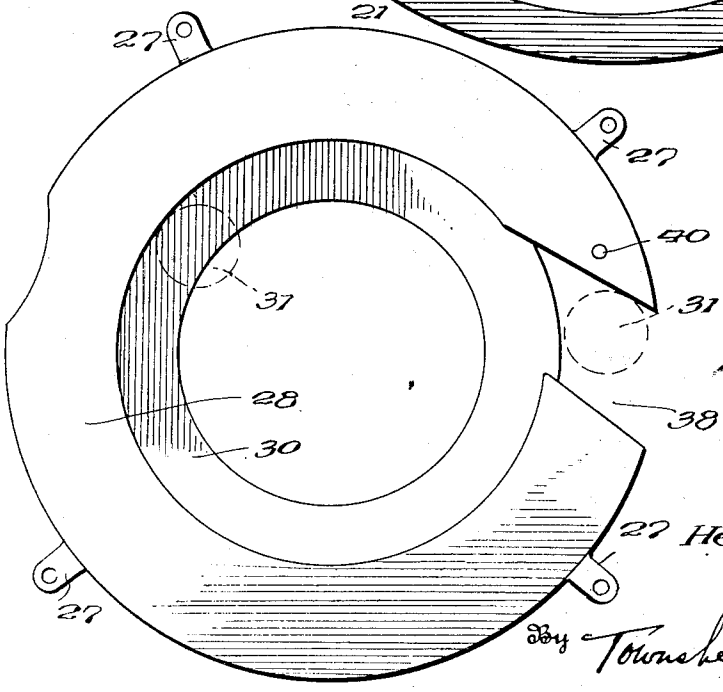


Fig. 3.



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COIN HANDLING MECHANISM

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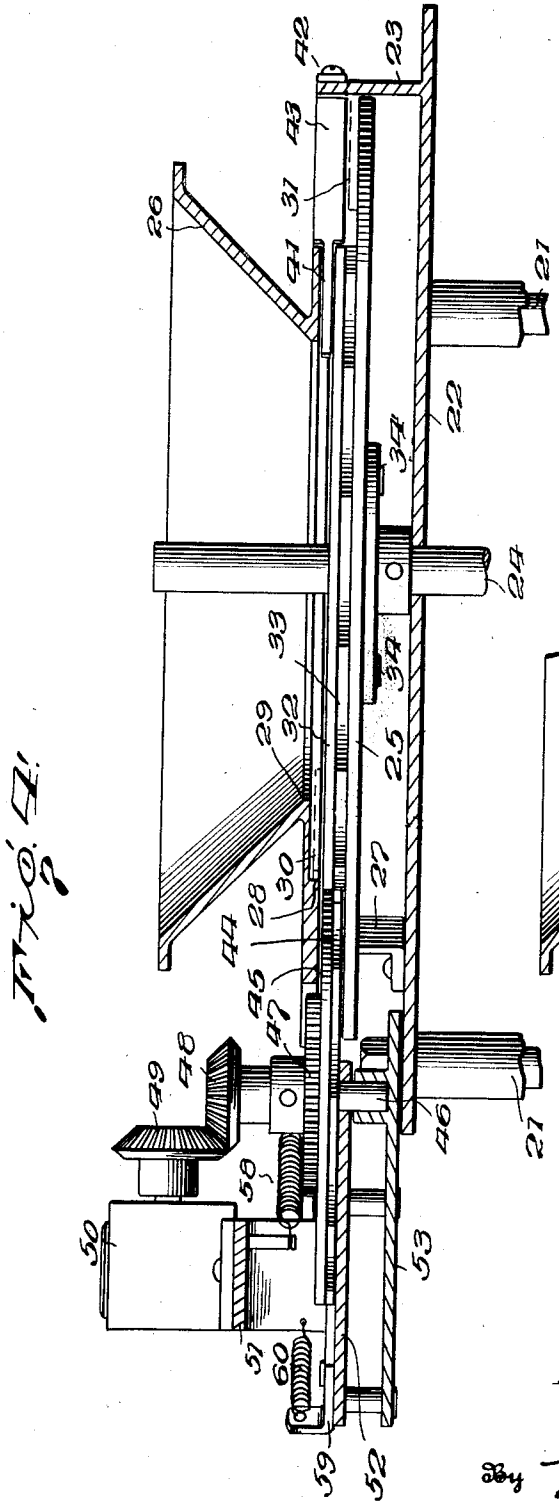


Fig. 4.

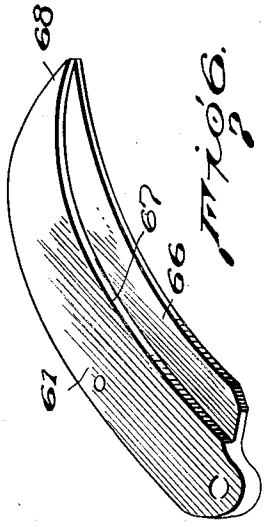


Fig. 6.

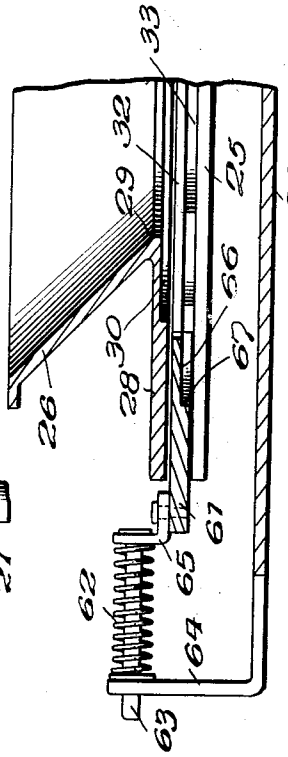


Fig. 5

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COIN HANDLING MECHANISM

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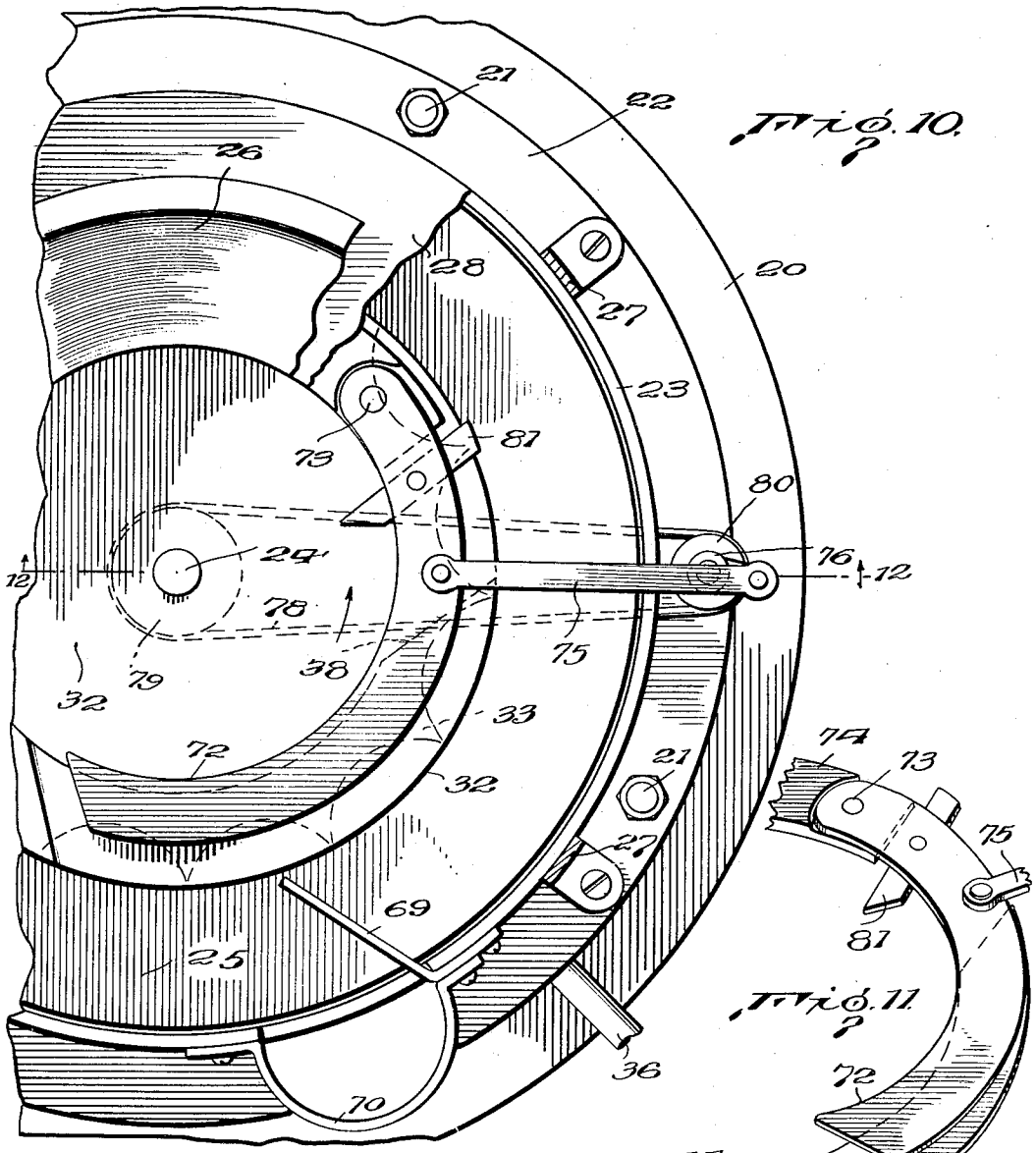


Fig. 10.

Fig. 11.

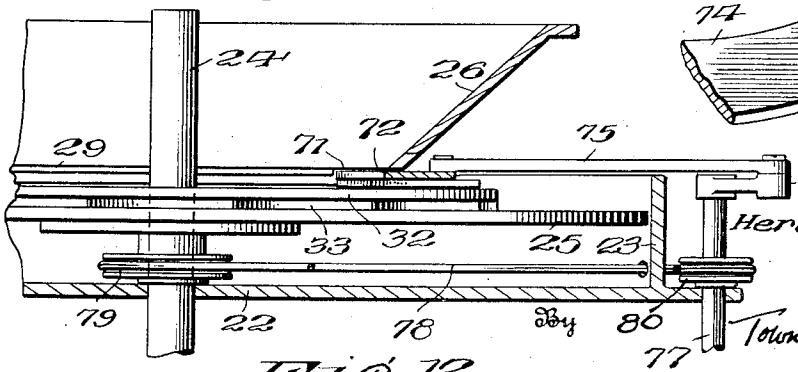


Fig. 12.

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COIN HANDLING MECHANISM

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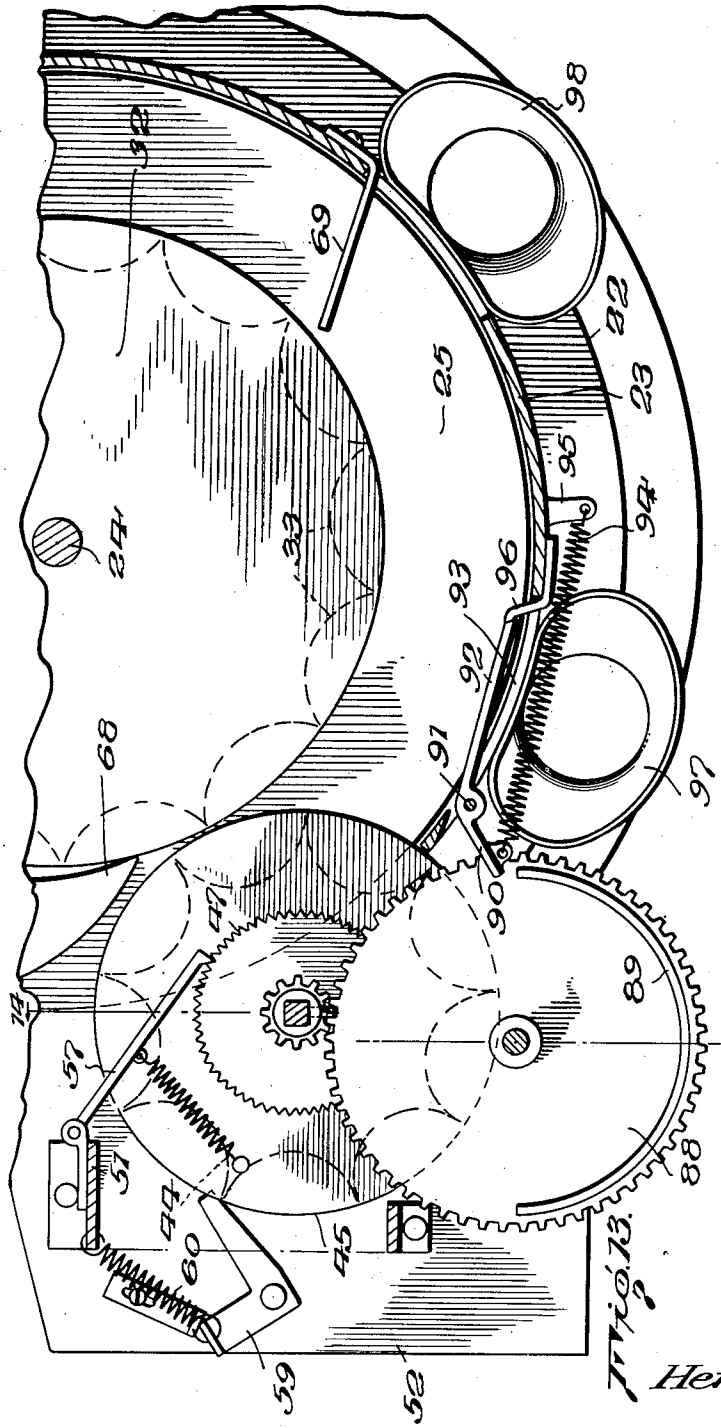


Fig. 13.

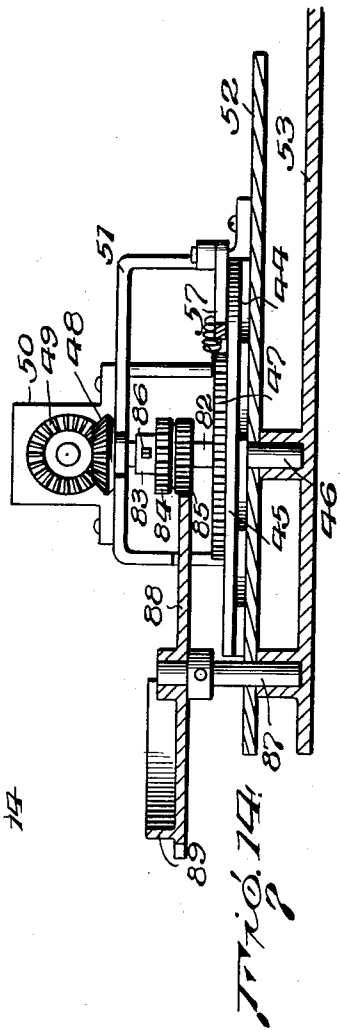


Fig. 14.

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COIN HANDLING MECHANISM

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Fig. 15

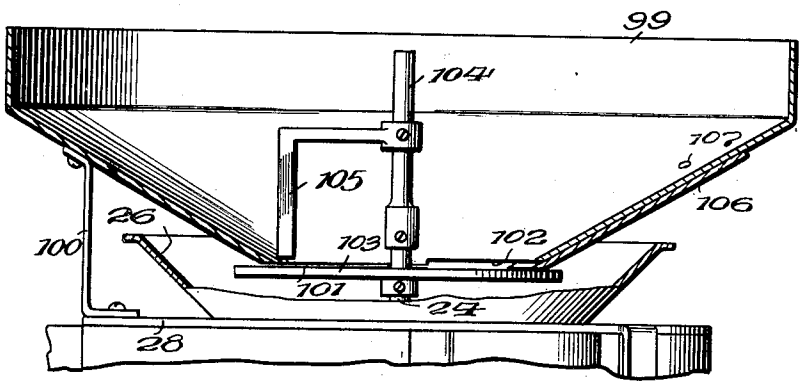


Fig. 16.

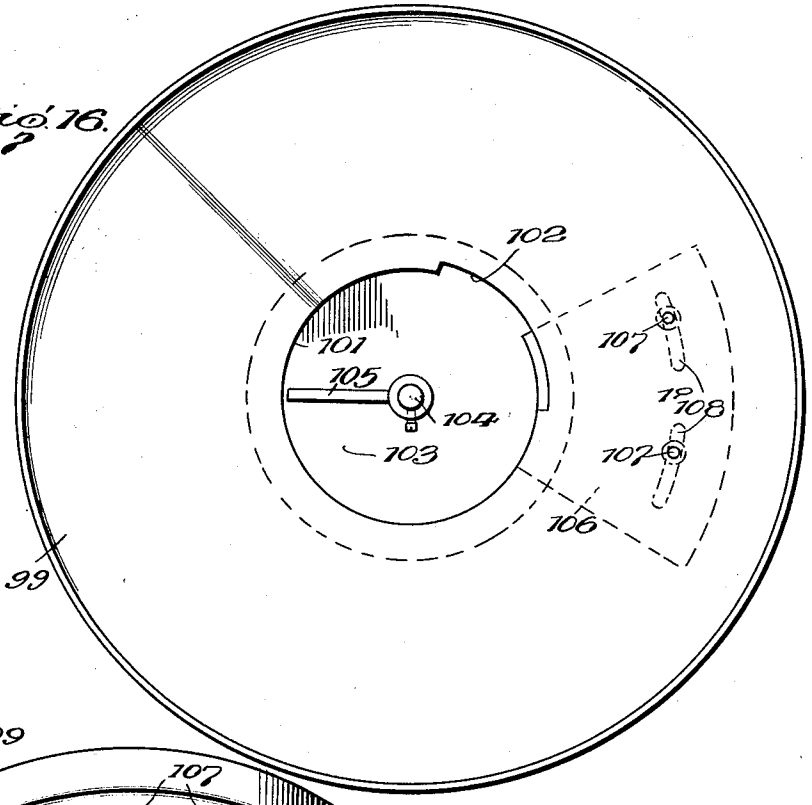
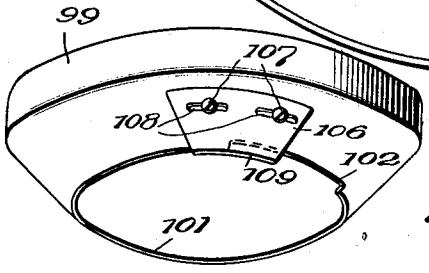


Fig. 17



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Patented Mar. 27, 1934 1,952,563

UNITED STATES PATENT OFFICE

1,952,563

COIN HANDLING MECHANISM

Herbert B. Myers, Little Rock, Ark.

Application December 22, 1931, Serial No. 582,600

21 Claims. (Cl. 133—8)

This invention relates to coin handling mechanism, particularly to apparatus designed to count and deliver a plurality of coins, checks, tokens and the like, in ordered and rapid sequence. This application is a continuation as to all common subject matter of my prior application Serial Number 500,370, filed December 5th, 1930.

An object of the invention is the provision of a machine for counting and delivering a plurality of coins and the like, and having register means adjustable with respect to delivering means whereby to accommodate the machine to variations in size of coins.

Another object is the provision in a machine of such character of striker means continuously acting during operation of the machine to contact coins and to position them for proper passage through the machine whereby to eliminate sticking or jamming.

Another object is the provision of a machine whereby a plurality of coins are handled into ordered sequence and delivered into distributed groups standardized for packaging.

A further object is the provision of an improved hopper and hopper feed regulating mechanism for coin handling machines, particularly of the type shown in my aforesaid copending prior application.

Other objects will be readily apparent from the description. This specification and the accompanying drawings describe and illustrate physical embodiments of the invention and constitute a preferred means by which the invention may be reduced to practice. It is to be understood that details of the disclosure shall not constitute limitations inconsistent with the scope of the invention as claimed.

Figure 1 of the drawings is a side elevation of a coin counting machine constructed in accordance with the invention.

Figure 2 is substantially a top plan view of the machine with the hopper removed.

Figure 3 is a bottom plan view of a coin guide and discharge ring employed.

Figure 4 is substantially a vertical section on line 4—4 of Figure 2.

Figure 5 is a fragmentary section on line 5—5 of Figure 2.

Figure 6 is a bottom perspective of a member employed to insure positive engagement of coins with the machine register mechanism.

Figure 7 is a section on line 7—7 of Figure 2.

Figure 8 is a section on line 8—8 of Figure 2.

Figure 9 is a section on line 9—9 of Figure 2.

Figure 10 is a fragmentary top plan view, with parts broken away for detail illustration, of an embodiment of the machine including a vibratory coin striker or flattening means.

Figure 11 is a perspective of the striker.

Figure 12 is a section on line 12—12 of Figure 10.

Figure 13 is substantially a horizontal section of the machine as equipped with means for automatically distributing coins for standard packaging.

Figure 14 is a section on line 14—14 of Figure 13.

Figure 15 is a vertical section through an improved coin hopper and hopper feed regulating mechanism which may be employed in connection with coin handling machines.

Figure 16 is a top plan view thereof.

Figure 17 is a detail perspective of the regulator means.

An embodiment of coin handling mechanism comprising a counting machine, as shown in Figure 1 consists of a support, such as a base 20, provided with a plurality of upright standards 21 arranged to support on their upper ends a coin retaining ring comprising a circular horizontal foot plate 22 attached to the standards, and a vertical wall portion 23 rising therefrom in concentric relation thereto.

A spindle 24 journalled in the base 20 and foot plate 22 extends axially up through the retaining ring, carrying a conveyor disc 25 disposed with its periphery in a slight clearance with respect to the ring wall 23 at about the central section of the wall. A coin feed hopper 26 is mounted over the top of the retaining ring 23 by means of a plurality of radially arranged hanger brackets 27 fastened at their lower ends to the foot plate 22 externally of the ring wall and with their upper ends being directed inwardly over the top of the ring wall and attached to the circular horizontal base plate 28 of the hopper, whereby the hopper is rigidly mounted with respect to the coin retaining ring with its base plate 28 substantialy flush with the upper edge of the ring.

The hopper 26 is of the funnel type having a restricted neck 29 and the under face of the base plate 28 is formed with an annular recess 30 opening to the hopper neck and providing a guideway of sufficient depth and diametrical extent to permit the ready sliding thereinto of coins, indicated as at 31, which lie flat on the top face of a cover disc 32 disposed over a star wheel annulus 33 seated on the carrier disc 25. The diameter of cover disc 32 is slightly greater than that of the guideway 30 so that the periphery of the cover disc lies beneath the overhang of the hopper base plate

28. The maximum diameter of the star wheel is substantially equal to the diameter of the cover disc 32 which it underlies but is no greater, and securing elements 34 are employed to effect a rigid connection between the cover disc, star wheel, and carrier disc 25 which is in turn fixed to the spindle 24 so that upon rotation of the spindle, the carrier disc, star wheel, and cover disc rotate as a unit.

The spindle 24 is driven through gearing indicated generally as at 35 actuated from a power shaft 36 having an operating crank handle 37. Motor drive, not shown, may be substituted for manual operation where desirable.

The hopper base plate 28, as best shown in Figure 3, has a tangential coin discharge channel 38 cut therethrough and opening to the coin guideway 30. The width of this channel may be varied to the requirements of different sizes of coins by means of an adjustable abutment block or finger 39 attached to the under face of the base plate at one side edge of the channel and movable to swing across the channel as desired. By this means only one coin at a time is permitted to enter the discharge channel. The block 39 is pivoted in threaded engagement with a bolt stem 40 which may be tightened in the usual manner to clamp the block against the plate and bind the block in position as set.

A coin rake off arm 41 extends tangentially inward from the retaining ring 23 to which it is rigidly attached through a lip 42, across the carrier disc and a portion of the cover disc 32, substantially filling the space between the disc surface and the base plate of the hopper. Between the periphery of the cover disc and retaining ring the body of the arm has a vertically enlarged portion 43 provided with a straight bottom edge spaced sufficiently above the surface of the carrier disc to permit passage of coins beneath the arm.

Substantially opposite the rake off arm 41 the retaining ring 23 has a segment thereof removed and in the opening thus provided there is arranged coin counting mechanism comprising a star wheel member 44 and an attached cover disc 45 fixed as a unit to a spindle 46 to rotate therewith and including a toothed wheel 47 fixed to the spindle. A pinion 48 on the spindle is meshed with the actuator pinion 49 of a register 50 of any suitable type which is mounted on a saddle bracket 51 attached to the floor plate 52 of a frame 53 on which the entire assembly of the counting mechanism is disposed.

The counting mechanism support frame is pivoted upon one of the standards 21 to be swung in a horizontal plane whereby to move the star wheel 44 and its associated cover disc 45 toward or away from the main star wheel 33 and its cover disc 32 over the subjacent exposed portion of the carrier disc 25. A link 54 pivoted to another of the standards 21 carries a threaded bolt 55 slidably engaging a slot provided therefor in the frame plate 53. A wing nut 56 threaded on the bolt stem provides a means for clamping the link and frame together to hold the counter supporting frame in a set adjusted position for the reception of a particular size of coin between the star wheels.

Positive actuation of the counter mechanism is assured by the provision of means for preventing actuation thereof except by coins. Such a means includes a ratchet arm 57 pivoted to the saddle bracket 51 and urged at all times into bearing engagement against the toothed wheel 47 by a spring 58 connected between the arm and bracket. The engaging end of the arm is provided with a head to interengage the teeth of the wheel 47 whereby the rotatable elements of the counter mechanism are held against accidental or too rapid movement. A dog 59 influenced by the spring 60 engages the points of the star wheel 44 to hold the wheel in proper position for engagement by coins.

Means are provided in advance of the counting mechanism for directing coins on the carrier disc into positive engagement with the coin seating recesses of the main star wheel 33. One such means comprises an arcuate finger 61 pivoted at one end to the edge of the retaining ring 23 to swing horizontally in and through the open segment of the ring, it being normally held yieldingly in against the periphery of the cover disc 32 by the action of expansion spring means 62 supported on a stem 63 slidable at one end through an upstanding bearing lug 64 fixed to the plate 22 and secured at its other end in an upstanding lug 65 pivoted to the top face of the finger 61 adjacent its outer edge.

The finger 61 has a width appreciably greater than the width of the exposed zone of the carrier disc 25. Its top face is flat and lies flush with the top face of the cover disc 32. Along its inner edge the underside of the finger is recessed to provide a runway 66 for the passage of coins beneath the finger, having a rear wall or shoulder 67 which is sharply curved throughout the extent of the finger and which merges into a bill 68 at the free end of the finger. This bill portion extends between the associated cover discs and star wheels of the separator and counting mechanisms, as seen best in Figure 2.

In the operation of the mechanism shown in Figures 1 to 9 a number of coins, tokens or the like to be counted are fed into the hopper 26 and the power shaft is actuated to set the machine in motion. By virtue of the sloping walls of the hopper the coins will slide flatly onto the rapidly rotating cover disc 32 which moves counterclockwise with respect to Figure 2. Under the action of centrifugal force the coins 31 will be thrown outwardly beneath the hopper base plate 28 into the circular guideway 30, the neck 29 of the hopper acting to strip off coins which may be stuck together. As the coins come into alignment with the discharge channel 38 in plate 28 they will be thrown outwardly by centrifugal force onto the exposed area of the carrier disc 25. As the coins contact the rake-off arm 41 they are directed through the discharge channel and pass beneath the portion 43 of the rake-off arm which flattens them on the carrier disc.

As the coins on the carrier disc reach the presser finger 61 they enter the guideway 66 beneath the finger and contact the curved shoulder 67 thereof. The finger yields against action of spring 62 sufficiently to permit free travel of coins but the tension of the spring is such that the coins will be forced in by the finger to a positive seating in the recesses of the star wheel 33. The bill portion 68 of the finger holds the coins in the star wheel 33 until they engage in the recesses of the counter star wheel 44 which has been set by proper adjustment of the frame 53 so that substantially half of the coin lines in each opposed star wheel recess as the coin passes therebetween on the face of the carrier disc, which face is so constructed that no slippage can occur.

As the coins pass successively between the star

wheels beneath their cover discs the counter actuator shaft is given a step by step rotation to register the passed coins on the mechanism 50. Too great a rotation of the counter star wheel is prevented by the arm 59 and reverse movement is rendered impossible by the dog 57.

After the coins have been counted they are carried along on the carried disc into engagement with a deflector 69 which guides them through a port in the ring wall 23 into a collector tube 70 leading to receptacle means, not shown.

In Figures 10, 11 and 12 is shown a structural embodiment of means which is intended for use in connection with the mechanism previously described for continuously agitating coins at and adjacent the point of discharge onto the carrier disc in order to eliminate the possibility of coins sticking thereat and jamming in the machine. Throughout Figures 1 to 12 like parts are indicated by like reference characters.

In this embodiment the neck 29 of hopper 26 adjacent the discharge channel 38 and for some distance on each side thereof is cut away to provide an open segment 71, Figure 12, through which is adapted to be oscillated a flat arcuate arm 72 pivoted by one end as at 73 to an annulus 74 attached to the under face of the hopper base plate 28 at one side of the coin discharge channel 38. The arm 72 may be pivoted directly to the base plate if desired. Oscillatory movement is imparted to the striker arm 72 through a link 75 pivoted at its ends to the striker arm and a crank 76 fixed to an operating shaft 77 journalled between the base 20 and plate 22 and driven from the shaft 24 by means of a belt 78 connecting a drive pulley 79 on shaft 24 with a driven pulley 80 on shaft 77.

In order to adjust the discharge channel 38 to different widths for coins of various sizes the striker arm 72 has pivoted to its under face an adjustable guide finger 81 which has a tight pivot connection so that it will be retained in position as set. The finger 81 may be turned and adjusted to vary the width of the entrance to the coin discharge channel.

In operation the throw of link 75 causes a continuous oscillatory vibration of the striker arm 72 which forcibly contacts coins on the disc 32, flattening them and loosening stuck coins so that there can be no jamming of the machine.

Figures 13 and 14 illustrate an adapation of the invention to the automatic distribution of coins into standard packages with selective means for effecting a variation in the number of coins distributed. Parts identical with those previously described are given like reference characters.

In this embodiment the drive spindle 46 which operates through the pinions 48 and 49 to actuate the register 50 on the saddle bracket 51 as the counter star wheel 44, its cover disc 45 and the toothed wheel 47 are rotated, is provided above the wheel 47 with a squared portion 82 upon which slides the hub 83 of a double gear having an upper gear 84 of twelve teeth and a lower gear 85 of fifteen teeth, the whole being adjustable on the spindle by a set screw 86 in the hub. At one side of the spindle 46 a second spindle 87 is mounted in the frame 52—53 for free rotation and has fixed thereto a sixty toothed gear wheel 88 adapted to be meshed with either gear 84 or 85 depending upon adjustment of the hub 83.

A half segment of the large gear 88 is provided adjacent its periphery with an upstanding cam riser 89 which under rotation of the gear engages the short arm 90 of a bell crank lever coin switch pivoted as at 91 on the retaining ring 23 above the foot plate 22 in a manner whereby its long arm 92 is swung laterally outward of the retaining ring to open a coin discharge port 93 therein which it normally closes under the influence of a retracting spring 94 connected between the short arm 90 and a lug 95 on the exterior of the retaining ring 23. A coin deflector 96 secured to the ring projects inwardly through the port 93 a short distance over the edge of the coin carrier disc 25 in substantially parallel relation to the deflector 69 which is spaced therebeyond. The inclined face of the deflector 96 provides a seat for the free end of switch arm 92, acting as a stop means to limit inward swing of the switch arm under action of the spring 94. A coin collector tube 97 is disposed at the discharge port 93 and a second collector tube 98 is disposed adjacent the discharge port at the deflector 69.

When it is desired to separate coins into groups of forty, as for instance nickels into two dollar groups, the mechanism is set as shown in Figures 13 and 14, with the fifteen toothed gear meshed with gear 88 and the end of cam riser 89 just in advance of the short arm 90 of the coin switch. Upon actuation of the mechanism gear 88 rotates in a counter-clockwise direction; the cam 89 engages the switch arm 90; and the arm 92 is swung outwardly to open port 93. As the coins pass between the main and counter star wheels they are thrown by centrifugal force through port 93 into the collector tube 97. Due to the gear ratio as the forty-first coin passes to the star wheels the cam 89 clears the arm 90 whereupon spring 94 snaps the arm 92 back against its seat 96 to close port 93.

The forty coins following will pass around on the carrier disc 25 to be discharged by deflector 69 into the collector 98. As the eighty-first coin actuates the counter star wheel the cam 89 again engages switch arm 90 and the operation is repeated. Coins may be packaged as desired from and with respect to the collector means 97 and 98.

For separating into groups of fifty the twelve toothed gear 84 is meshed with gear 88. The cycle of operations is otherwise the same as that described. By the cooperative action of the coin switch and cam the coins are automatically grouped as long as the machine operates.

Figures 15, 16 and 17 illustrate an attachable coin feed hopper adapted to be used with the mechanism of Figures 1 to 14, having means for regulating the rate of coin feed and for insuring an even flow to the machine. Such a construction comprises an auxiliary hopper 99 of greater capacity than the machine hopper 26 over which it is supported in spaced relation therefrom by standards 100, one of which is shown in Figure 15 detachably connected to the hopper base plate 28. The neck 101 of the auxiliary hopper is concentric with the neck of hopper 26 and has substantially a quarter segment thereof cut away to form a coin discharge port 102. A rotary distributor disc 103 is adapted to be attached to the shaft 24 at its upper end to close the hopper neck and form a bottom therefor, and extending into the hopper above the disc is a spindle 104 attached to the shaft 24. This spindle has adjustably attached thereto a substantially L shaped agitator finger 105 of spring metal for the purpose of keeping coins in motion within the hopper.

As the machine is operated coins are discharged from the disc 103 radially through the port 102. As a means of regulating the rate of discharge

through this port into the hopper 26 there is provided a sector shaped closure plate 106 slidable circumferentially on the exterior wall of hopper 99 and guided by bolts 107 on the hopper engaged in slots 108 in the plate. The bolts are headed to overlie the edges of the closure plate slots so that they may be tightened to clamp the plate in a set position. The bottom edge 109 of the closure plate coincides with the hopper neck 101 so that the plate may be moved across the port 102 to open and close it to the degree desired for a certain rate of coin feed to hopper 26.

I claim:

1. In a coin handling apparatus, a movable coin conveyor, a register, an actuator for said register, actuator operating means fixed to said conveyor and spaced from said actuator, means for operating said conveyor, and self-adjusting guiding means for holding coins on the conveyor to connect said actuator and actuator operating means.

2. In a coin handling apparatus, a rotary coin receiving member, means for rotating said member to discharge coins therefrom by centrifugal force, a coin register adjacent said rotary member, an actuator for said register, a register operating element fixed to said rotary member, and self-adjusting means for holding coins on said rotary member in position to couple said operating element and register actuator.

3. Means for counting coins, comprising a rotatable carrier, a coin holder fixed thereto, a counter, a counter actuator extending over said carrier in the path of coins in said holder, and means for moving coins on the carrier into said holder in advance of said actuator.

4. In a coin handling apparatus, a rotary disc, means for delivering coins thereon, means for rotating said disc to move coins thereon by centrifugal force, means for discharging coins from said disc in ordered sequence, a coin carrier fixed to said disc and extending therefrom beneath the disc periphery to receive coins discharged from the disc, a coin counter, an actuator for said counter and extending over said carrier, an operating member on said carrier, and means for causing coins on said carrier to couple said operating member and actuator to operate said counter.

5. In a coin handling apparatus a rotary separating disc, means for rotating said disc, a coin feed hopper above said disc, an annular base plate on said hopper, means supporting said base plate in fixed position slightly above the face of said disc, said base plate having a coin discharge channel, and means on said base plate in the mouth of said channel for varying the width thereof.

6. In a coin handling apparatus, a rotary separator disc, means for rotating said disc, a coin feed hopper above said disc, a retaining ring surrounding said disc, a base plate on said hopper and fixed to said ring to cover said disc, said base plate having a coin discharge channel provided therein, and coin striker means operable through said channel for flattening coins on said disc at the channel mouth.

7. In a coin handling apparatus, means for separating a plurality of coins into an ordered sequence by centrifugal force, means for counting the coins when separated, counter operating means on said separating means and normally disconnected from the counting means, and self-adjusting coin engaging means for connecting said counting means and operating means through coins on said separating means.

8. In a coin handling apparatus, a coin feed hopper, a rotatable coin discharge disc closing the bottom thereof, a coin discharge channel formed through a portion of the hopper above the disc, and means for adjustably varying the width of said discharge channel.

9. In a coin handling apparatus, a coin feed hopper, a rotatable coin discharge disc closing the bottom thereof, said hopper having a coin discharge opening formed in the bottom edge thereof, and means movable on a wall of the hopper to vary the size of the discharge opening.

10. In a coin handling apparatus, a rotary disc, means for feeding coins to said disc, means for rotating said disc to discharge coins therefrom by centrifugal force, means for directing the discharge of coins from a plurality of points relative to said disc, and means for automatically and alternately discharging a predetermined number of coins at each of said discharge points.

11. In a coin handling apparatus, a rotatable member adapted to discharge coins at a plurality of points, means automatically operable to direct a predetermined number of coins to each discharge point, and said directing means being selectively operable to vary the number of coins influenced thereby.

12. Coin distributing means comprising a coin conveyor, means for moving said conveyor, means for feeding coins to said conveyor, means for removing coins from said conveyor at spaced points, means automatically operable to cause said removing means to function alternately and periodically, and means for varying the periodicity of said last named means.

13. In a coin handling apparatus, a rotatable coin carrier, a coin holder carried thereby, a flat cover disc attached to said carrier over said coin holder, means for delivering coins to said cover disc, means for rotating said carrier, holder and disc as a unit to move coins from said cover disc to the carrier by centrifugal force, and means for guiding coins on the carrier into said coin holder beneath said cover disc.

14. Means for counting coins, comprising a rotatable carrier, a coin holder fixed thereto, a counter, a counter actuator extending over said carrier in the path of coins in said holder, and a spring pressed coin guiding member for engaging coins on the carrier and moving them transversely thereon into said holder immediately in advance of said actuator.

15. In a coin handling apparatus, a rotary member adapted to discharge coins therefrom by centrifugal force, a plate disposed adjacent said member, a support for said member, said plate having a pivoted connection with said support for swinging movement laterally to and from said member, a link pivoted to said support, means for connecting said link and said plate in positions assumed by the plate upon adjustment laterally with respect to said rotary member, coin counting means on said plate and having a portion adapted to extend over said rotary member.

16. In a coin handling apparatus, a rotary separator disc, means for rotating said disc, a coin feed hopper above said disc, a retaining ring surrounding said disc, a base plate on said hopper and fixed to said retaining ring whereby to cover the peripheral portion of said disc, said base plate having a laterally directed coin discharge channel provided therein, a coin striker member mounted for reciprocatory movement in and through said discharge channel, means for op-

erating said disc, and means for operating said striker member as said disc is operated.

17. In a coin handling apparatus, a coin feed hopper, a rotatable coin discharge disc closing the bottom thereof, said hopper having a peripheral coin discharge opening in its bottom edge, and a plate slidably secured on a wall of said hopper to extend across said discharge opening to vary the size thereof.

18. Coin distributing means comprising a rotatable member adapted to discharge coins at a plurality of points, means for closing off one discharge point while another is open, means for opening said closing off means, and means selectively controlling the operation of said opening means whereby to vary the number of coins influenced thereby.

19. In a coin handling apparatus, a coin conveyor adapted to discharge coins therefrom at points spaced apart, means for blocking the discharge of coins from one of said points, means for actuating said conveyor, means operated by said conveyor actuating means for periodically rendering said coin blocking means ineffective, and means for selectively determining the periodical operation of the said means for rendering the coin blocking means ineffective.

20. In a coin handling apparatus, a coin conveyor adapted to discharge coins by centrifugal force, means for retaining coins on said conveyor against discharge, said retaining means being provided with a pair of spaced coin discharge ports, a closure for one of said ports and pivotally supported on said retaining means, and means for swinging said closure to open position during a predetermined period of rotation of said conveyor.

21. In a coin handling apparatus, a rotary coin conveyor adapted to discharge coins therefrom by centrifugal force, coin retaining means associated therewith for preventing uncontrolled discharge of coins, said retaining means being provided with a coin discharge port, a swingable closure for said port and pivotally mounted on said retaining means, means normally retaining said closure in closed position, and means for swinging said closure to open position throughout a predetermined extent of rotation of said coin conveyor.

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