June 21, 1932. E. P. DONNELLAN 1,863,971

STOP MECHANISM FOR COIN COUNTING MACHINES

Filed June 12, 1931 2 Sheets-Sheet 1

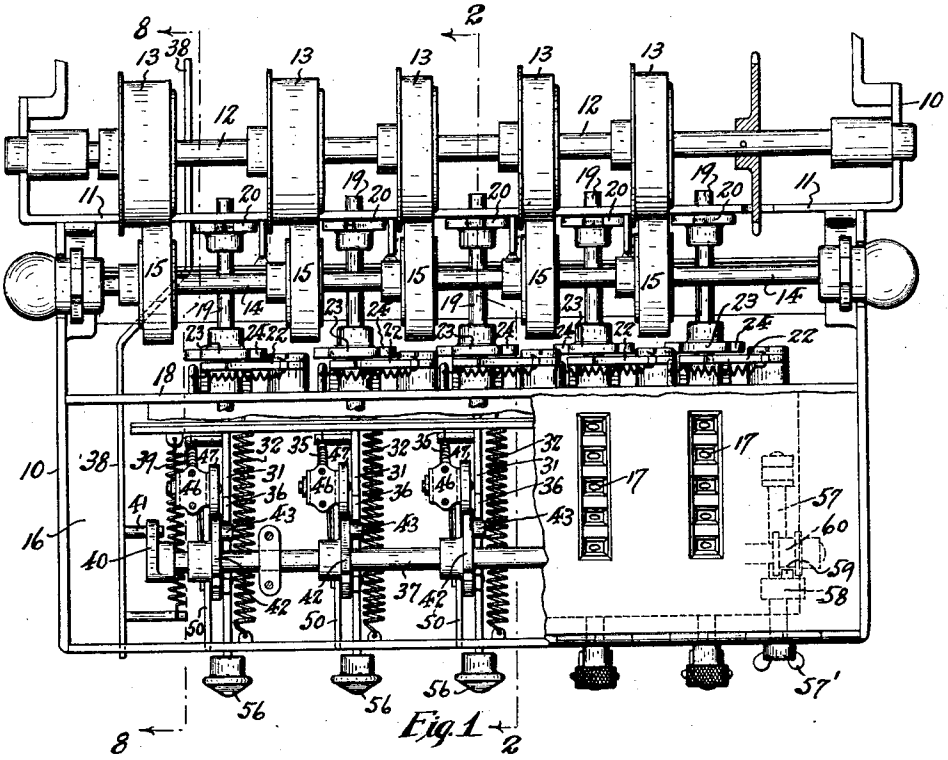


Fig. 1

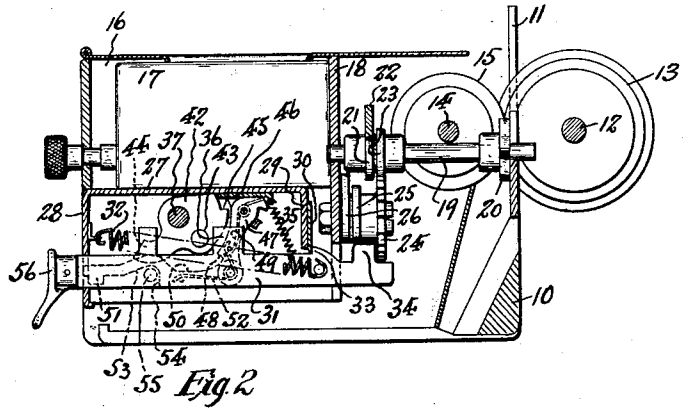


Fig. 2

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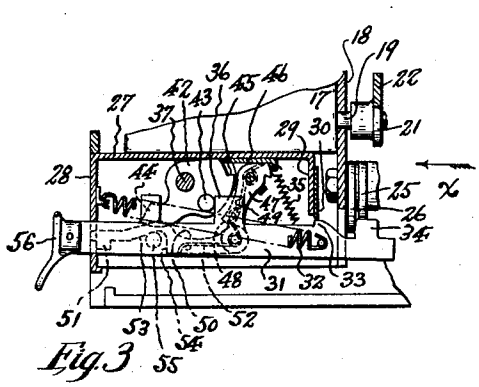


Fig. 3

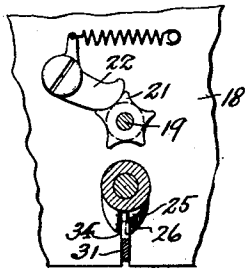


Fig. 4

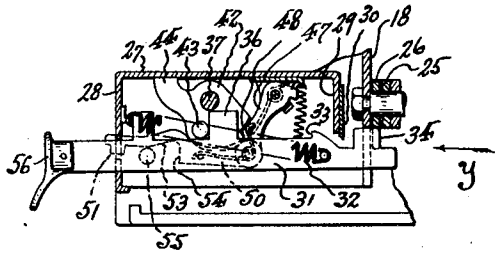


Fig. 5



Fig. 6

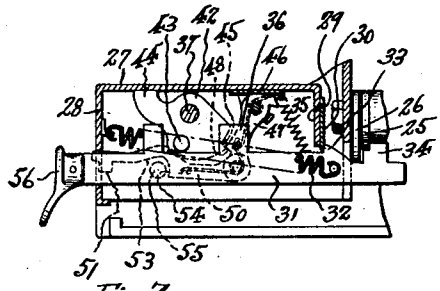


Fig. 7

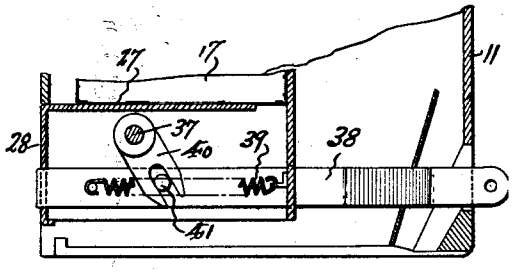


Fig. 8

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UNITED STATES PATENT OFFICE

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STOP MECHANISM FOR COIN COUNTING MACHINES

Application filed June 12, 1931. Serial No. 543,793.

This invention relates to coin counting machines, and has reference, more particularly, to stop mechanism for automatically stopping the feeding of coins upon completion of the count of a predetermined number thereof.

This invention has for its principal object to provide a power driven coin counting machine of the general type shown in my copending application for Letters Patent Ser. No. 408,187, filed November 19th, 1929, with an improved means for automatically interrupting the transmission of power to the coin supplying or feeding means, whereby the coin feeding operation is immediately discontinued upon completion of the count of a predetermined number of coins of any given denomination.

More particularly, this invention provides novel means to positively lock the counting register actuating mechanism when the last of a predetermined number of coins has passed the star wheel of said actuating mechanism, and said positive lock means includes a setting slide bar which is tripped by the counting register actuating mechanism for spring actuated forward movement to engage in a notched wheel forming part of the latter mechanism so as to positively arrest further movement of said mechanism. Furthermore, said slide bar, when released, actuates power clutch releasing means whereby actuating power for the machine is cut off, and said clutch releasing means includes a detent mechanism which independently holds and locks the same in clutch releasing position until the slide bar is fully reset to normal initial position.

This invention has for a further object to provide novel means for shifting the clutch releasing means relative to the slide bar and detent mechanism to arrange the machine for continuous counting operations when desired.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:—

Fig. 1 is a fragmentary plan view of a coin counting machine, showing the counting register actuating mechanism and the novel automatic clutch releasing means for arresting operation of the machine and positively locking the register actuating mechanism against movement, parts being broken away to disclose underlying mechanism.

Fig. 2 is a transverse vertical section, taken on line 2—2 in Fig. 1.

Figs. 3, 5 and 7 are respectively fragmentary sectional views similar to that of Fig. 2, but showing various stages in the operation of the clutch releasing and register locking mechanisms.

Fig. 4 is a fragmentary rear side elevation, viewed in the direction of the arrow x in Fig. 3; and Fig. 6 is a similar view, viewed in the direction of the arrow y in Fig. 5.

Fig. 8 is a fragmentary transverse vertical section, taken on line 8—8 in Fig. 1.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawings, the reference character 10 indicates the framework of a coin counting machine, including a backplate 11 in connection with which are formed descending chute-like passages respectively adapted to receive different denominations of coins, such as dimes, pennies, nickels, quarters and half-dollars, which are supplied thereto by a coin assorting and feeding means (not here shown) which forms part of the machine substantially in the manner disclosed in my aforesaid copending application for Letters Patent Ser. No. 408,187, filed November 19, 1929, and which is driven from

a source of power, such as an electric motor, by transmission mechanism including a suitable releasable clutch means, as also disclosed in my said copending application, but illustration of which is not essential to an understanding of the present invention.

Journaled in the framework 10, to extend along the rear side of said back-plate 11, is a shaft 12 which is also driven from the clutch controlled power transmission of the machine. Fixed on said shaft 12 are primary coin propelling rolls 13, there being one such roll for each chute-like passage, and consequently for each denomination of coin handled by the machine. Said back-plate 11 is suitably cut away to permit the peripheries of the rolls 13 to intersect said chute-like passages. Also journaled in the framework 10, to extend along the forward side of said back-plate 11, is a shaft 14 upon which are fixed secondary coin propelling rolls 15, the peripheries of which engage the peripheries of said primary rolls 13.

Said back-plate 11, in conjunction with the framework 10, bounds a housing 16 which contains the counting registers 17 and actuating mechanisms therefor; there being one register for each denomination of coin.

Fixed within the housing 16 is a transverse bearing plate 18, forwardly spaced from and parallel to said back-plate 11. Journaled to extend forwardly from said back-plate 11 through said bearing plate 18 are register actuating shafts 19, which are respectively disposed adjacent to the sets of primary and secondary coin propelling rolls 13—15. Fixed on each shaft 19, to lie in the path of movement of coins downwardly propelled by the adjacent set of coin propelling rolls, is a star-wheel 20. A similar star-wheel 21 is fixed on each shaft 19 at the rear side of said bearing plate 18, and cooperating with each of these star-wheels 21 is a suitable yieldable detent-pawl 22 to prevent overthrow of the shafts 19 when actuated by coins propelled into operative engagement with star-wheels 20 by the rolls 13—15. Said star-wheels 20 each possess five points so that shafts 19 will each complete a full revolution on actuating engagement of the star-wheels by five successive coins.

Fixed on each shaft 19 is the driving member 23 of a Geneva gearing, the driven member 24 of which is rotatably mounted on a stud shaft projecting from said bearing plate 18. The Geneva gearings for the different counting registers differ in ratio according to the predetermined number of coins of a given denomination desired to be counted as a lot; all in the manner clearly disclosed in my aforesaid copending application for Letters Patent Ser. No. 408,187, filed November 19th, 1929. Fixed in connection with each driven member 24 of the Geneva gearings, so as to rotate therewith, is a trip cam 25 and a notched lock wheel 26, the purposes of which will presently appear.

Arranged within said housing 16, beneath the registers 17, is a frame member 27 including a front plate 28 and a depending rear flange 29. Connected with the latter is a latch-bar 30. Movable through said front plate 28 are slide bars 31 corresponding in number to the number of counting registers and actuating means therefor. Each slide bar 31 is arranged for forward sliding movement under the urge of spring means 32. Toward their rearward ends, each slide bar is provided with a latch-nosing 33 which engages with said latch-bar 30 to normally retain the slide-bar in inwardly moved position. At its rearward end, each slide bar is further provided with an upwardly projecting combined trip and lock lug 34; which, when the slide-bar occupies its normal inwardly moved position, is rearwardly off-set out of register with a corresponding notched lock-wheel 26 but engages the periphery of the associated trip cam 25. The rearward end of each slide bar 31 is yieldably uplifted by spring means 35 to normally engage its latch-nosing 33 with said latch-bar 30. Each slide bar 31 is provided intermediate its ends with an upstanding push-lug 36, the purpose of which will be hereafter explained.

Suitably journaled within the housing 16, to extend across and above said slide bars 31, is a rock-shaft 37. Transversely slidable through the housing 16, adjacent to one end of said rock-shaft 37, is a clutch control bar 38, which is actuated in inward direction by a pull-spring 39 to actuate a clutch (not shown) operate to couple the machine transmission mechanism with the source of driving power, but which when moved in outward direction operates to release said clutch. Fixed on said rock-shaft 37 is a forked lever arm 40 which engages a laterally projecting stud 41 carried by said clutch control bar 38, whereby the latter is operatively connected with said rock-shaft.

Fixed on said rock-shaft 37, adjacent to each slide-bar 31, are rocker plates 42, the same having laterally projecting studs 43, which extend across adjacent slide-bars 31 to lie in front of the push-lugs 36 thereof. Each rocker plate is provided at one side with a stop-arm 44 adapted to engage the frame member 27 to limit the movement of the rocker plate, and consequently the rock-shaft 37, in one direction. Each rocker plate is further provided, on its opposite side with a peripheral notch 45 engageable by the hereinafter described detent mechanism.

Pivotally supported from bearing brackets 46, which are secured to the underside of said frame member 27, are detent levers 47, which respectively lie adjacent to the rearward sides of the rocker plates 42. Said detent levers are provided with catch-nosings

48, engageable at proper times with the peripheral notches 45 of said rocker plates 42. Said detent levers 47 are yieldably urged toward said rocker plates 42 by spring means 49. Pivotally connected with the lower free ends of said detent levers 47 are forwardly extending lock-levers 50, the forward free ends of which engage through slots provided in said front plate 28 of said frame member 27, said free ends being further provided with rearwardly off-set stop-lugs 51 which normally bear against the inner side of said front plate 28 to hold said lock levers in position to normally swing said detent levers 47 clear of the peripheral notches 45 of said rocker-plates. Said lock levers are normally yieldably urged downwardly to the described locked positions by spring means 52. Said lock levers are formed, rearwardly of their free ends, with inclined lift cam portions 53, terminating at their rearward ends in thrust shoulders 54. Connected with each slide bar 31 is a laterally projecting lock lever control stud 55 which lies forward of the thrust shoulder 54 of an adjacent lock lever and beneath the lift cam portion 53 of the latter.

The exteriorly projecting forward end of each slide bar 31 is provided with a suitably formed finger or push-piece 56 to aid in the manual operation of the same at proper times.

The rock-shaft 37 is so mounted in its supporting bearings as to be capable of a limited longitudinal shafting movement, whereby the same may be so moved at will, as to laterally displace the rocker plates 42 and their studs 43 from operative relation to adjacent slide-bars 31, whereby tripping of the latter will not actuate the rock shaft to move the clutch control bar 38 to clutch releasing position, when it is desired that the machine shall continuously count coins, rather than count the same in lots of predetermined number. The means for manually shifting the rock-shaft 37 and its rocker plates 42 to in service or out of service position, as the case may be, comprises a suitably journaled cross shaft 57, having a forward exteriorly projecting end equipped with a finger-piece 57′ for actuating the same (see Fig. 1). Secured to said cross shaft 57 is a lever arm 58 provided with a stud 59 which engages in an annularly channeled collar 60 carried by said rock-shaft 37. By turning said cross shaft 57 to the left, said lever arm 58 is swung to the left to longitudinally shift said rock shaft 37 and its rocker-plates to out of service position; and, vice versa, by turning said cross shaft to the right, said rock shaft and its rocker-plates are brought back to in service position.

The operation of the mechanisms, when arranged to count coins in lots of predetermined number, is as follows:

The slide bars 31 are all pushed inwardly, against the tension of their springs 32, until their latch-nosings 33 are engaged in restrained relation by the latch-bar 30, and their lock lugs 34 underlie the trip cams 25, all as shown in Fig. 2 of the drawings. When said slide bars occupy such positions, the clutch control bar 38 is held by the spring 39 in position to retain the clutch means of the machine power transmission operative to transmit actuating power to the coin counting machine. The machine now functions to assort and feed coins to the several counting register actuating means according to their denominations, whereby the coins pass to the coin propelling rolls 13—15, which grip and impel the same in passing engagement with the star wheels 20. As each coin engages in passing contact with a star wheel 20, it produces a rotative impulse of the latter, each such impulse being transmitted through the shafts 19 to and with actuating effect upon the counting registers 17. The rotations of the shafts 19 are in turn transmitted to the Geneva gearing 23—24 for producing rotative movement of said trip cams 25 and notched lock wheels 26, to thereby produce completed revolutions of the same when a predetermined number of coins of a given denomination have passed and actuated a corresponding star wheel 20 and associated counting register. Preferably the trip cams 25 are set slightly in advance of the associated notched lock wheels 26, so that they trip the slide bars 31 controlled thereby just before the last coin is counted, whereby the lock lug 34 of a tripped slide bar is arrested by an arm of the notched lock wheel 26, (see Figs. 3 and 4), thus depressing the rear end of said slide bar to disengage its nosing 33 from the restraint of the latch bar 30, so that as actuation by the last coin ensues, the notch of the lock wheel 26 will be moved into registration with the lock lug 34, to completely release the affected slide bar 31 for forward sliding movement under the pull of its spring 32, whereby the lock lug 34 is moved into the notch of said lock wheel 26, thus positively preventing further rotative movement thereof, and consequently positively locking the register actuating means associated therewith against further movement (see Figs. 5 and 6).

When the desired predetermined number of coins of any given denomination has been counted, resulting in the release, forward sliding movement and locking effect of a slide bar 31, as above described; the forward movement of the latter carries its push-lug 36 into thrusting engagement with the stud 43 of an associated rocker plate 42, whereby said rocker plate is swung forward, until stopped by engagement of its stop-arm 44 with the frame member 27. This swinging movement of the rocker plate 42 rocks the rock shaft 37 to swing the lever arm 40 so as to pull outward

the clutch control bar 38, to thereby throw out the clutch of the machine power transmission means with resultant immediate stoppage of the machine.

The forward swinging movement of the rocker plate 42 positions peripheral notch 45 opposite the catch-nosing 48 of the adjacent detent lever 47. During the forward sliding movement of the slide-bar 31, the stud 55 thereon is carried forwardly into engagement with lift cam portion 53 of the lock-lever 50, whereby the forward end of the latter is lifted to release its stop-lug 51 from normal abutment against the front plate 28, thus freeing the lock-lever 50 for forward movement, and thereby releasing the detent lever 47 for movement, under the urge of its spring 49, toward the rocker plate 42. This movement of the detent lever 47 carries its catch-nosing 48 into holding engagement with the peripheral notch 45 of the rocker-plate 42, thereby positively locking the same, and thereby also retaining the rock-shaft 37 and clutch control bar 38 in the clutch releasing position to which it has been moved (see Fig. 5), such conditions being maintained until the slide bar 31 is re-set to normal latched position, and whereby accidental or premature throwing in of the clutch and restarting of the machine is avoided until latched condition of the re-set slide bar is assured.

To re-set the slide-bar 31, the operator presses inwardly on its push-piece 56, thereby thrusting inward the slide-bar 31 so that its latch-nosing 33 is snapped over the latch-bar 30. This inward movement of the slide-bar 31, does not disturb the detained condition of the rocker plate 42 as maintained by the detent lever 47, but merely carries inwardly and away from the stud 43 the push-lug 36, while relocating the latch-nosing 33 behind the latch-bar 30, at the same time removing the lock lug 34 from the notched lock wheel 26 and repositioning the same beneath the trip cam 25. The described inward movement of said slide bar 31 also carries the stud 55 away from the lift cam portions 53 of the lock-lever 50 to a position ready to engage the thrust shoulder 54 of the latter (see Fig. 7).

By the above described operations, return of the slide bar 31 to normal locked position has been assured before any possibility of releasing the clutch control bar 38 for clutch engaging operation. To release the clutch control bar 38 for clutch engaging operation, the operator continues inward thrust upon the slide bar 31, to produce a limited inward movement of the same slightly beyond its normal locked position. This additional movement carries the stud 55 into inwardly pushing engagement with the thrust shoulder 54 of the lock-lever 50, whereby the latter is moved inwardly until its stop-lug 51 falls into stopped abutment upon the front wall 28 under the downward pressure of spring 52. This inward movement of the lock-lever 50 swings back the detent lever 47, thereby removing the catch-nosing 48 from detaining engagement with the peripheral notch 45 of the rocker plate 42. The rocker plate 42 being thus freed, the spring 39 will slide inward the clutch control bar 38 to clutch actuating position, thus again subjecting the machine to power driven operation. This spring actuated movement of said clutch control bar also operates through lever arm 40 to return the rock-shaft 37 and its rocker plates 42 to normal initial position, ready for a repetition of the above-described operations as soon as the count of another lot of coins of any denomination is completed.

While I have described the mechanism as arranged to count coins of several different denominations, it will be understood that it may be arranged to count either a single or two or more different denominations as may be desired.

As many changes could be made in the above described constructions and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In a clutch control for power operated coin counting machines having coin actuated counting register mechanism, a clutch control mechanism, a normally arrested spring actuated slide-bar for operating said clutch control mechanism, means operated through said counting register mechanism to release said slide-bar for operative effect upon said clutch control mechanism, detent means operative to independently hold said clutch control mechanism in slide-bar actuated condition until said slide-bar is reset to normal arrested position, and means operative on excess of return movement of said slide-bar beyond its normally arrested position to release said detent means.

2. In a clutch control for power operated coin counting machines having coin actuated counting register mechanism, a clutch control mechanism, a normally arrested spring actuated slide-bar for operating said clutch control mechanism, means operated through said counting register mechanism to release said slide-bar for operative effect upon said clutch control mechanism, normally inactive detent means, means operated by outward movement of said slide-bar to render said detent means active for holding said clutch control mechanism in slide-bar actuated condition until said slide-bar is reset to normal arrested position, and means operated by excess of return movement of said slide-bar beyond its nor-

mally arrested position to release said detent and return the same to inactive condition.

3. In a clutch control for power operated coin counting machines having coin actuated counting register mechanism, a clutch control means, a rock-shaft having means to engage said clutch control means, rock-shaft actuating means, a spring actuated slide-bar having means to operatively engage said rock-shaft actuating means, means to hold said slide-bar in normal initial position against tension of its spring, means operated through said counting register mechanism to release said slide-bar on completion of the count of a predetermined number of coins, detent means to hold said rock-shaft actuating means in operated position effected by outward movement of the released slide-bar and until said slide-bar is reset to normal initial position, and means operative on excess of inward movement of said slide-bar beyond its normal reset position for releasing said detent means.

4. In a clutch control for power operated coin counting machines as defined in claim 3, in which the slide-bar is provided with a lock-lug, and in which said slide-bar release means comprises a rotatable trip-cam, and a notched lock-wheel to receive said lock-lug on released movement of said slide-bar whereby said counting register mechanism is positively locked against operation.

5. In a clutch control means for power operated coin counting machines having means to feed coins to a plurality of counting devices according to their denominations, which counting devices have coin actuated operating shafts; a clutch releasing means, a rock-shaft having means to actuate said clutch releasing means, spring actuated slide-bars having latch-nosings, a fixed latch bar engageable by said latch-nosings to retain said slide-bars retracted against the tension of their springs, rocker-plates on said rock-shaft having laterally projecting studs, said slide-bars having push-lugs to engage said studs, stop means to limit actuated movement of said rocker-plates, trip cams rotatable for releasing said slide-bars, said strip cams being actuated from the operating shafts of said counting devices by intermediate transmission means adapted to time the movement of said trip cams according to the count of predetermined numbers of coins by said counting devices, normally inactive detent means to cooperate with said rocker plates, means operated by outward movements of corresponding slide-bars to render said detent means active for holding said rocker-bars in slide-bar actuated condition until the actuating slide-bar is reset to normal initial position, and means operated by excess return movement of the reset slide-bar beyond its normal arrested position for releasing said detent means and returning the same to initial inactive condition.

6. In a clutch control means for power operated counting machines as defined in claim 5, in which each slide-bar is provided with a lock-lug, and notched lock-wheels rotatable with said trip-cams adapted to receive lock-lugs of corresponding released slide-bars whereby rotation of corresponding counting device operating shafts is positively arrested.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 26th day of May, 1931.

EDWARD P. DONNELLAN.