Aug. 31, 1954 B. COOPER ET AL 2,687,691

PRINTING COUNTER ZEROIZING APPARATUS

Filed March 19, 1951

2 Sheets-Sheet 1

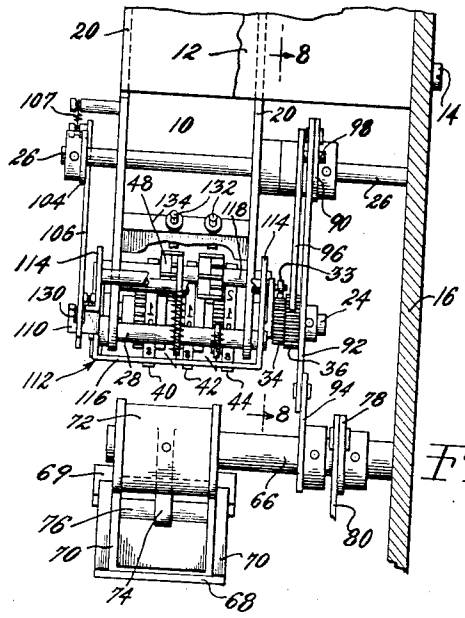


FIG. 1

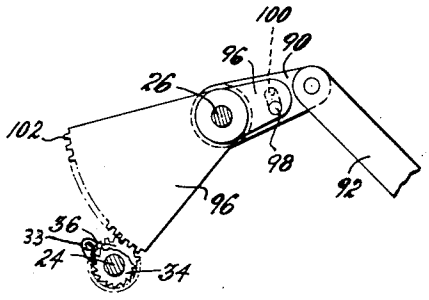


FIG. 8

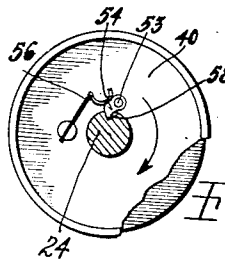


FIG. 4

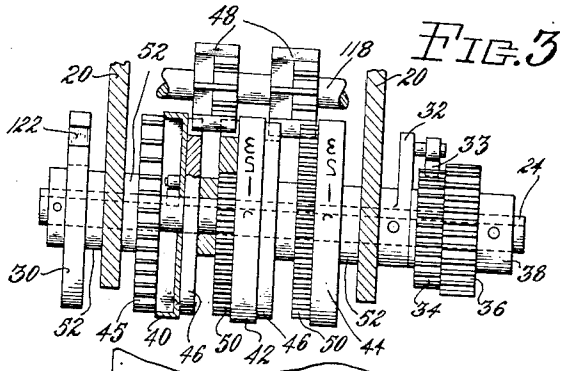


FIG. 3

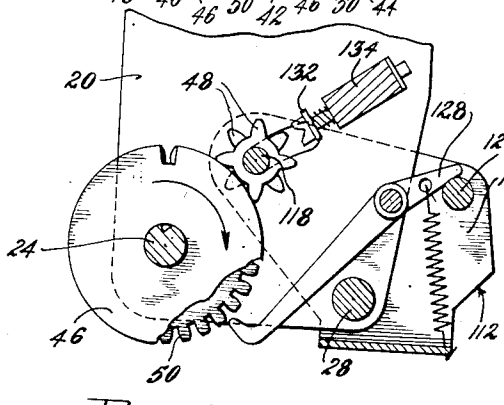


FIG. 5

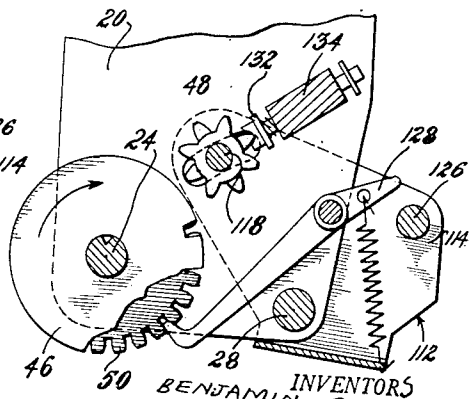


FIG. 6

INVENTORS
BENJAMIN COOPER
and ALBERT HOHMANN
BY
J. B. Feeslin
ATTORNEY

Aug. 31, 1954

B. COOPER ET AL

2,687,691

PRINTING COUNTER ZEROIZING APPARATUS

Filed March 19, 1951

2 Sheets-Sheet 2

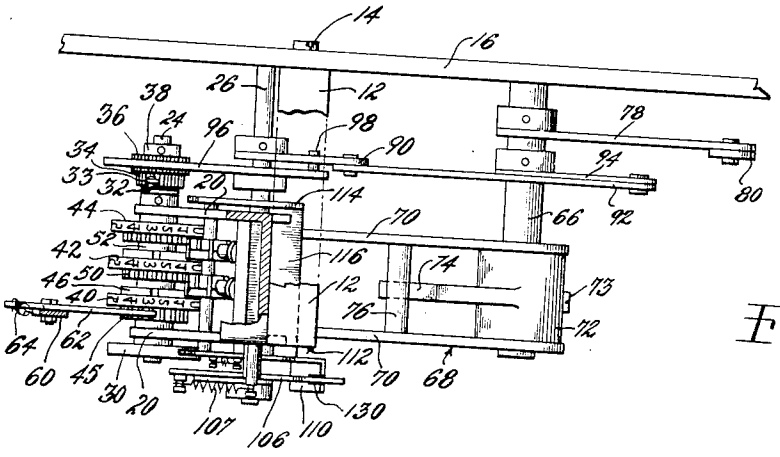


FIG 2

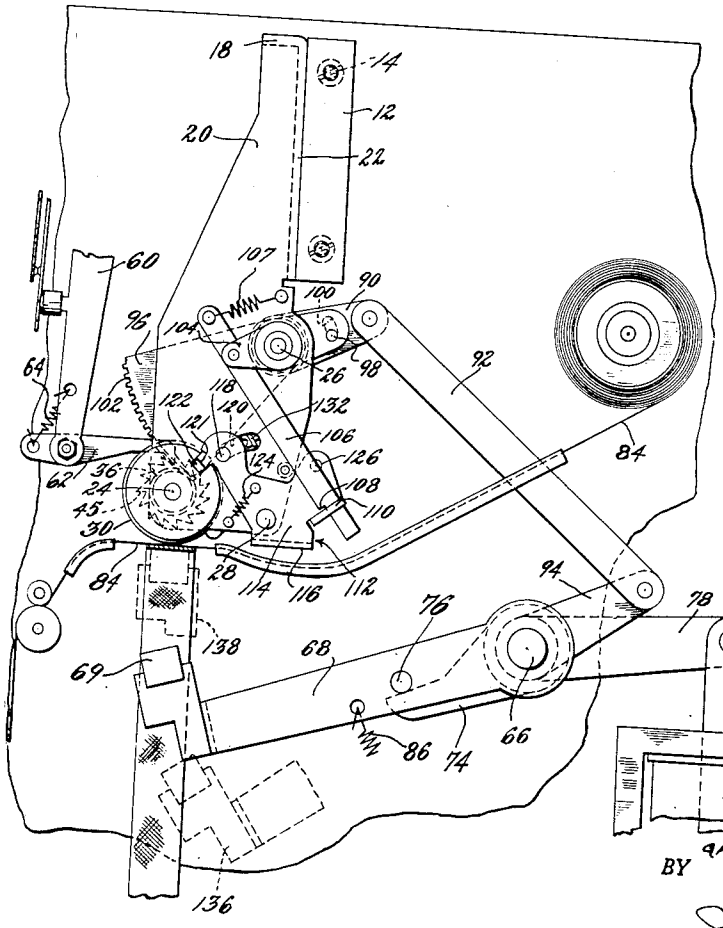


FIG 7

INVENTORS
BENJAMIN COOPER
and ALBERT HOHMANN
BY
J. B. Felsheim
ATTORNEY

Patented Aug. 31, 1954

2,687,691

UNITED STATES PATENT OFFICE

2,687,691

PRINTING COUNTER ZEROIZING APPARATUS

Benjamin Cooper, New York, N. Y., and Albert Hohmann, Teaneck, N. J.; said Hohmann assignor to said Cooper

Application March 19, 1951, Serial No. 216,382

18 Claims. (Cl. 101—80)

1

This invention relates generally to printing counters and in particular to a printing counter having improved digit wheel zeroizing means.

The invention is directed toward application on a counter having plural digit wheels rotatably mounted on a reset shaft and provided with a cooperating transfer mechanism. The counter is further provided with initial drive means adapted to rotate one of said plurality of digit wheels which co-acts with the transfer mechanism to actuate the remaining digit wheels. The number of digit wheels that may be utilized is limited only by the count requirement i. e.; the highest number that the counter will be required to accumulate. The said wheels are conventionally known as "unit," "tens" and "hundreds" wheels by virtue of the mode of operation and are each provided with raised numerals zero through nine, inclusive, equidistantly disposed on the periphery thereof.

Thus, a complete revolution of the "unit" digit wheel will, through the transfer mechanism, effect one tenth of a revolution of the "tens" digit wheel. Accordingly, the latter digit wheel rotates from a "zero" indicating position to a "one" indicating position. The "unit" wheel having rotated completely, will indicate a "zero" and a count of ten will be indicated on both wheels. Subsequent counts may be accumulated on the digit wheels or if desired, the said digit wheels may be reset to zero position at the completion of each counting operation.

Printing counters of this type require one complete rotation of the reset shaft to effect a zero resetting operation. Heretofore, the said shaft was rotated first in one direction and then in the opposite direction. Upon rotating in the latter direction, the reset shaft picks up the digit wheels and individually restores them to zero printing position. Initial rotation of the reset shaft, therefore, performs no useful function. Conversely, the undesirable initial rotation may displace the relative digit wheel settings to produce an incomplete or inaccurate printing of the indicia thereon. The present invention retains said shaft stationary during the initial operation of the resetting mechanism, thus insuring an accurate clear print.

Therefore, one object of the invention resides in the provision of improved resetting means wherein the reset shaft is rotated in but one direction with each oscillation of an oscillating drive means.

A further object is to provide means to lock said reset shaft stationary during printing operations.

2

Another object of the invention provides for means operable to release said shaft locking means after a print has been made and prior to the zeroizing of the digit wheels.

And another object is to provide means to reengage said shaft locking means upon said digit wheels being rotated to zero position.

A further object of the invention is to provide a printing counter of the character described wherein the printing mechanism motive means serves as motive means for the digit wheel resetting means.

Other ancillary objects will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter described and of which scope of application will be indicated in the appended claims.

In the drawing, in which is shown one of the various possible embodiments of the invention:

Fig. 1 is a front elevation of an electro-magnetic printing counter with the electro-magnet omitted to more fully illustrate the embodiment of the invention.

Fig. 2 is a plan view of the counter shown in Fig. 1.

Fig. 3 is an enlarged fragmentary detail of the digit wheels and transfer mechanism.

Fig. 4 is a cross-section taken through a digit wheel.

Fig. 5 is an enlarged detail taken in cross-section, of the transfer mechanism in normal engaged position.

Fig. 6 is an enlarged detail taken in cross-section, of the transfer mechanism in disengaged position with the transfer gears locked against rotation.

Fig. 7 is a side elevation of a printing counter illustrating the digit wheel resetting means and a printing mechanism disposed mid-way of the return stroke of a printing operation.

Fig. 8 is a cross-section taken along lines 8—8 of Fig. 1.

Referring now in detail to the various figures of the drawings, 10 designates a counter unit mounted on transverse horizontal support bar 12 that is secured, as by screws 14, to vertical frame plate 16. Counter unit 10 consists of a U-shaped frame 18 having parallel side walls 20 and a vertical transverse portion 22 extending therebetween. Journalled in suitable apertures in side walls 20 are transverse shafts 24, 26, and 28. Shaft 24 extends through side walls 20 and has a notched disc 30 fixed thereto outside of one of

the walls 20. The portion of shaft 24 extending outside of the other wall 20 has mounted thereon, a fixed arm 32 supporting a spring pressed pawl 33, a revolvable ratchet 34 and pinion 36 and a fixed retaining collar 38. Disc 30, arm 32, ratchet 34, pinion 36, collar 38 and shaft 24 are elements of a digit wheel resetting mechanism, hereinafter described in detail.

Journalled on shaft 24 and interposed between frame side walls 20 in spaced relation, are digit wheels 40, 42, and 44. A coaxial ratchet wheel 45 having ten teeth circumferentially spaced thereon, is secured to a side face of digit wheel 40. Digit wheel 40, the "unit" counting wheel, is coupled to digit wheel 42 through the usual transfer disc 46, pinion 48 and gear 50. Analogously, digit wheel 44 is coupled to digit wheel 42 by means of a transfer disc 46, pinion 48 and gear 50. Each of the digit wheels have numerical indicia representative of the numbers zero through nine disposed equidistantly about the periphery thereof. Washers 52 serve to space the digit wheels in proper operating relation.

Each of the digit wheels has mounted on its inner side face, as by stud 53, a small pawl 54 adapted to angularly engage the periphery of shaft 24 under the tension of a small leaf spring 56. Shaft 24 is provided with longitudinal groove 58 adapted to engage pawls 54 and latch the respective digit wheels thereto when said shaft is rotated in a clockwise direction. Accordingly, when said digit wheels are rotated in a clockwise direction, pawls 54 ride over groove 58 and are ineffective to latch the digit wheels to the shaft. The initial drive source for counting on digit wheels 40, 42, and 44 is provided by an electro-magnet, not shown, but arranged to be mounted within counter frame 18 in a well known manner. The electro-magnet armature, also not shown, has an arm 60 depending therefrom that is arranged to oscillate each time the electro-magnet is energized. Arm 60 pivotally supports a pawl swing 62 that is urged by spring 64 into engagement with ratchet wheel 45. Thus, digit wheel 40 is rotated one tenth of a revolution with each oscillation. The aforesaid transfer mechanism will rotate digit wheel 42, the tens counting wheel, one complete revolution for each ten revolutions of unit digit wheel 40. The hundreds digit wheel 44 will similarly rotate one revolution with each ten revolutions of tens digit wheel 42. As shown in the drawings, digit wheels 40, 42, and 44 rotate clockwise during counting operations.

Means are provided to print a record of the total count accumulated on said digit wheels. To this end, there is provided a horizontally extending shaft 66 journalled at one end in vertical plate 16. Journalled on shaft 66 in aligned relation to counter unit 10, is a substantially U-shaped hammer piece 68. Interposed between arms 70 of said hammer piece is a bushing 72 secured to shaft 66, as by screw 73, and provided with a transversely extending under-lip 74. Also interposed between arms 70 of hammer piece 68, is a rod 76 disposed in spaced relation with bushing 72 to overlie under-lip 74. An arm 78, secured to shaft 66 and extending oppositely from hammer piece 68, is pivotally secured to plunger 80 of solenoid 82. Therefore, energization of solenoid 82 will depress plunger 80 and rotate arm 78, bushing 72 and hammer piece 68 clockwise, Fig. 7, carrying platen 69 into striking engagement with paper strip 84. Paper strip 84 is thereby pressed against digit wheels 40, 42, and 44 and a print is made. Hammer piece 68 is reset to the lower position indicated in dotted line by means of coil spring 86.

Means is provided to reset the digit wheels to zero printing position after a print has been made. Means directed toward this end resides in the provision of a transverse arm 90 affixed to shaft 26. Arm 90 is pivotally connected to a link 92 which is, in turn, pivotally connected to an arm 94 affixed to printing shaft 66. A sector gear 96 is journalled on shaft 26 and has a pin 98 projecting horizontally therefrom. Pin 98 projects through an arcuate slot 100 formed in arm 90 and is provided for a purpose that will be hereinafter apparent. Teeth 102 on sector gear 96 are arranged for meshing engagement with pinion 36. Also secured to shaft 26 is an arm 104 which pivotally supports a link 106. Formed on the lower portion of link 106 is a shoulder 108 that abuts against flange 110 of pivotal member 112. Member 112 is provided with paralleled vertical arms 114 having a transverse portion 116 extending therebetween. Shaft 28 extends through side walls 20 of counter frame 18 and the respective ends are secured in vertical arms 114. Shaft 28 thereby provides a pivot for member 112. Member 112 also has mounted between arms 114, a shaft 118 on which transfer pinions 48 are journalled. Shaft 118 extends through a pair of matching arcuate slots 120 provided in counter frame side walls 20. The outer arm 114 is further provided with a projection 121 that normally resides in notch 122 formed in disc 30. In this position, shaft 24 is locked against movement. Coil spring 124 disposed in tensioned relation between outer arm 114 and counter frame 18 normally urges projection 121 into peripheral engagement with disc 30. Member 112 further supports a transverse shaft 126 that normally biases spring detents 128 out of engagement with digit wheel gears 50.

Flange 110 of member 112 has a slot 130 therein, open at one end, in which link 106 is disposed with shoulder 108 abutting against the closed portion of said slot. Spring 107 secured to link 106 and to frame wall 20, resiliently retains link 106 in slot 130. Thus, when link 106 is displaced downwardly, member 112 rotates clockwise until shoulder 108 slides off the angularly displaced flange 110. During the clockwise pivotal movement of member 112, transfer pinions 48 are moved out of engagement with the respective digit wheels and into engagement with spring detents 132 yieldably supported in transverse bar 134 secured between walls 20 of counter frame 18. Arcuate slots 120 in frame side walls 20 permit limited movement of transfer pinion shaft 118 therein. Concurrently therewith, spring detents 128 are allowed to engage gears 50. Spring detents 132 are provided to retain the transfer pinions in relative positions during the disengagement thereof for zero resetting operations. Analogously, spring detents 128 engage the digit wheel transfer gears to functionally dampen the digit wheels and thus prevent overthrow during digit wheel zero resetting operations.

Operation of the digit wheel resetting mechanism will now be described.

During counting operations, printing hammer piece 68 is disposed at its lowermost position, designated as 136 in Fig. 7, and accordingly, arm 94 and arm 90 are positioned in their respective counter-clockwise positions, not shown. Sector gear 96 is similarly disposed counterclockwise of the position shown in the drawings.

Upon the initiation of a printing operation by

the energization of solenoid 82, printing shaft 66, arm 78 and hammer piece 68 rotate clockwise to position said hammer piece at its uppermost position generally designated as 138. At the same time, link 92 is pulled downwardly, thus rotating arm 90 clockwise. Sector gear pin 98 is normally disposed in engagement with the uppermost periphery of slot 100 by the gravitational positioning of sector gear 96. Therefore, clockwise rotation of arm 90 rotates sector gear 96 clockwise without delay. Teeth 102 thereon mesh with the teeth on pinion 36 during the clockwise movement of sector gear 96. Pinion 36 freely revolvable on shaft 24, rotates counter-clockwise and ratchet wheel 34 revolving therewith rides under pawl swing 33 and is ineffective to rotate shaft 24. Arm 104 on shaft 26 raises link 106 upwardly a distance insufficient to disengage the reduced portion of said link from slot 130 in flange 110. It will be apparent that projection 121 on member 112 remains engaged with notch 122 in disc 30 during the clockwise printing stroke of hammer piece 68. Shaft 24, therefore, is locked against rotation during the printing stroke.

The clockwise printing stroke provides a means to prepare the digit wheel resetting mechanism for subsequent operation during the return stroke thereof. As shown in Fig. 7, printing hammer piece 68 is positioned midway of the return stroke and the digit wheel resetting mechanism is positioned to initiate a resetting operation. Continued counter-clockwise rotation of arm 94, link 92 and arm 90 rotates shaft 26 counter-clockwise. Arm 104 thereon moves link 106 downwardly causing shoulder 108 to abut against flange 110 and pivot member 113 clockwise. Transfer pinions 48 on shaft 118 are moved out of engagement with the digit wheels and into engagement with spring detents 132. Further, projection 121 is moved out of notch 122 in disc 30 and shaft 24 is free to rotate. By means of pin 98 and slot 100 counter-clockwise rotation of sector gear 96 is delayed until member 112 has been pivoted to release shaft 24. When the lower end of slot 100 engages pin 98, continued counter-clockwise rotation of arm 90 rotates sector gear 96 counter-clockwise. Accordingly, pinion 36 on shaft 24 is rotated clockwise. Ratchet wheel 34 secured to pinion 36 engages pawl swing 33 on arm 32 and rotates shaft 24 clockwise. Groove 58 in shaft 24 engages digit wheel pawls 54 irrespective of the positions thereof and rotates said digit wheels to the zero printing position. With the continued downward movement of link 106, flange 110 is angularly displaced and cams shoulder 108 out of engagement therewith, thus permitting member 112 to pivot counter-clockwise under the influence of spring 124. Projection 121 on member 112 engages the periphery of rotating disc 30 and upon the completion of one revolution, reengages notch 122 to accurately position the respective digit wheels on zero printing position. As projection 121 reengages notch 122, transfer pinions 48 similarly reengage the digit wheel transfer means.

Counter unit 10 is now reset and conditioned for subsequent counting operations.

It will thus be seen that there is provided a device in which the several objects of the invention are achieved and which is well adapted to meet the conditions of practical use.

The invention claimed is:

1. In a counter, a rotatable shaft, a plurality of digit wheels mounted for rotation thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, said wheels being rotatable relative to said shaft in said direction for counting without turning the shaft, releasable means to lock the shaft against rotation, a member movable in opposite directions, electric motive means to move said member in opposite directions, means controlled by movement of said member in one direction and deriving its power from said motive means to first release said shaft locking means and thereafter rotate said shaft in said direction of rotation of said shaft for zeroizing said counter wheels.

2. In a counter, a rotatable shaft, a plurality of digit wheels mounted for rotation thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, said wheels being rotatable relative to said shaft in said direction for counting without turning the shaft, releasable means to lock the shaft against rotation, a member movable in opposite directions, electric motive means to move said member in opposite directions, means controlled by movement of said member in one direction and deriving its power from said motive means to first release said shaft locking means and thereafter rotate said shaft in said direction of rotation of said shaft for zeroizing said digit wheels, transfer mechanism for said digit wheels, and means controlled by said shaft locking means to release the transfer mechanism from said digit wheels upon releasing said shaft locking means.

3. In a counter, a rotatable shaft, a plurality of digit wheels mounted for rotation thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, said wheels being rotatable relative to said shaft in said direction for counting without turning the shaft, releasable means to lock the shaft against rotation, a member movable in opposite directions, electric motive means to move said member in opposite directions, means controlled by movement of said member in one direction and deriving its power from said motive means to first release said shaft locking means and thereafter rotate said shaft in said direction of rotation of said shaft for zeroizing said digit wheels, and including means to retain said shaft locking means in shaft locking position during movement of said member in the opposite direction.

4. In a counter, a rotatable shaft, a plurality of digit wheels mounted for rotation thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, said wheels being rotatable relative to said shaft in said direction for counting without turning the shaft, releasable means to lock the shaft against rotation, a member movable in opposite directions, electric motive means to move said member in opposite directions, means controlled by movement of said member in one direction and deriving its power from said motive means to first release said shaft locking means and thereafter rotate said shaft in said direction of rotation of said shaft for zeroizing said digit wheels, and including means to retain said shaft locking means in shaft locking position during movement of said member in the opposite direction, means to print against the digit wheels, and means controlled by said motive means to move the printing means toward the digit wheels during the movement of said member in the opposite direction and to move the printing means away from the digit wheels during movement of said member in said first direction.

5. In an electro-motive counter, a counter shaft,

a plurality of digit wheels rotatably mounted on said shaft, means on the shaft to zeroize the digit wheels upon rotating the shaft in one direction, said wheels being rotatable relative to said shaft in the same direction during operation of said counter, a pivotally mounted shaft locking member having means to lock the shaft upon pivotal movement in one direction, and to release the shaft for rotation upon being pivotally moved in an opposite direction, a second shaft, an arm pivoted to the second shaft elective motive means, means deriving its power from said electric motive means for oscillating said arm in opposite directions, means controlled by said second shaft for pivotally moving the first shaft locking means when said arm is rotated in one direction, and to leave the shaft locking member in locking position upon moving said arm in an opposite direction, means to rotate said first shaft in the direction for zeroizing the digit wheels, and a lost motion connection between said arm and said shaft rotating means to actuate the shaft rotating means upon moving said arm in said first direction only after said movement of said arm in said first direction has caused pivotal movement of said locking means to release said first shaft.

6. In a counter, a frame, a shaft rotatable thereon, a plurality of digit wheels mounted thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, a disc fixed for rotation with said shaft and formed with a peripheral notch, a locking member pivoted on said frame and having means to engage said notch to lock the shaft against rotation, a second shaft on said frame, an arm rotatable about the axis of the second shaft, a second arm movable with the first arm about the axis of said second shaft, a member pivoted to the second arm and provided with means engaging said locking member for rotating the same when said second arm is rotated in one direction about its axis to release the locking member from engagement with the notch in said disc, and the pivoted member being movable without affecting said locking member upon movement of said second arm in an opposite direction about its axis of rotation, a segmental gear rotatable about the axis of the second shaft, a gear rotatable about the axis of the first shaft and meshing with said segmental gear, pawl and ratchet means interconnecting the second gear with said first shaft for rotating said shaft in the direction of zeroizing movement of the shaft upon moving the segmental gear in the first direction of rotation of said second arm, and permitting movement of said segmental gear in an opposite direction without rotating said first shaft, and a lost motion connection between said first arm and said segmental gear so that said first arm may have limited movement in the first direction of second arm without affecting said segmental gear, during which movement said pivoted member on the second arm releases said locking member.

7. In a counter, a frame, a shaft rotatable thereon, a plurality of digit wheels mounted thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, a disc fixed for rotation with said shaft and formed with a peripheral notch, a locking member pivoted on said frame and having means to engage said notch to lock the shaft against rotation, a second shaft on said frame, an arm rotatable about the axis of the second shaft, a second arm movable with the first arm about the axis of said second shaft, a member pivoted to the second arm and provided with means engaging said locking member for rotating the same when said second arm is rotated in one direction about its axis to release the locking member from engagement with the notch in said disc, and the pivoted member being movable without affecting said locking member upon movement of said second arm in an opposite direction about its axis of rotation, a segmental gear rotatable about the axis of the second shaft, a gear rotatable about the axis of the first shaft and meshing with said segmental gear, pawl and ratchet means interconnecting the second gear with said first shaft for rotating said first shaft in the direction of zeroizing movement of said first shaft upon moving the segmental gear in the first direction of rotation of said second arm, and permitting movement of said segmental gear in an opposite direction without rotating said first shaft, and a lost motion connection between said first arm and said segmental gear so that said first arm may have limited movement in the first direction of said second arm, without affecting said segmental gear, during which movement said pivoted member on the second arm releases said locking member, means to print against the counter wheels, means to move the printing means toward the counter wheels upon moving said first arm in said opposite direction, and means to move said printing means away from the counter wheels upon moving said first arm in said first direction.

8. In a counter, a frame, a shaft rotatable thereon, a plurality of digit wheels mounted thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, a disc fixed for rotation with said shaft and formed with a peripheral notch, a locking member pivoted on said frame and having means to engage said notch to lock the shaft against rotation, a second shaft on said frame, an arm rotatable about the axis of the second shaft, a second arm movable with the first arm about the axis of said second shaft, a member pivoted to the second arm and provided with means engaging said locking member for rotating the same when said second arm is rotated in one direction about its axis to release the locking member from engagement with the notch in said disc, and the pivoted member being movable without affecting said locking member upon movement of said second arm in an opposite direction about its axis of rotation, a segmental gear rotatable about the axis of the second shaft, a gear rotatable about the axis of the first shaft and meshing with said segmental gear, pawl and ratchet means interconnecting the second gear with said first shaft for rotating said first shaft in the direction of zeroizing movement of said first shaft upon moving the segmental gear in the first direction of rotation of said second arm, and permitting movement of said segmental gear in an opposite direction without rotating said first shaft, and a lost motion connection between said first arm and said segmental gear so that said first arm may have limited movement in the first direction of said second arm, without affecting said segmental gear, during which movement said pivoted member on the second arm releases said locking member, means to print against the counter wheels, means to move the printing means toward the counter wheels upon moving said first arm in said opposite direction, and means to move said printing means away from

the counter wheels upon moving said first arm in said first direction, transfer mechanism interconnecting the digit wheels, and means connecting said transfer mechanism to the locking member for disengaging the transfer mechanism from the digit wheels when the locking member is released, and for reengaging the transfer mechanism with the digit wheels upon engaging the locking member with said disc.

9. In a counter, a frame, a shaft rotatable thereon, a plurality of digit wheels mounted thereon, means to zeroize the digit wheels upon rotating the shaft in one direction, a disc fixed for rotation with said shaft and formed with a peripheral notch, a locking member pivoted on said frame and having means to engage said notch to lock the shaft against rotation, a second shaft on said frame, an arm rotatable about the axis of the second shaft, a second arm movable with the first arm about the axis of said second shaft, a member pivoted to the second arm and provided with means engaging said locking member for rotating the same when said second arm is rotated in one direction about its axis to release the locking member from engagement with the notch in said disc, and the pivoted member being movable without affecting said locking member upon the movement of said second arm in an opposite direction about its axis of rotation, a segmental gear rotatable about the axis of the second shaft, a gear rotatable about the axis of the first shaft and meshing with said segmental gear, pawl and ratchet means interconnecting the second gear with said first shaft for rotating said first shaft in said direction of zeroizing movement of said first shaft upon moving the segmental gear in the first direction of rotation of said second arm, and permitting movement of said segmental gear in an opposite direction without rotating said first shaft, and a lost motion connection between said first arm and said segmental gear so that said first arm may have limited movement in the first direction of said second arm, without affecting said segmental gear, during which movement said pivoted member on the second arm releases said locking member, said pivoted member being releasable from the locking member automatically upon moving said locking member to released position after said shaft has been rotated upon being released, and resilient means to move the released locking member back into engagement with said notch upon said notch reaching the means on the locking member engageable therewith, to again lock said shaft.

10. In combination, a counter comprising a shaft, a plurality of digit wheels rotatably mounted thereon, means normally locking said shaft against rotation, means to print against said digit wheels, motive means to actuate said printing means, means to zeroize said digit wheels upon rotating said shaft in one direction, oscillating means, means to actuate said oscillating means deriving its power from said printing motive means, and means operable by said actuating means to first release said shaft locking means and thereafter actuate said oscillating means to rotate said shaft in said zeroizing direction.

11. In combination, a counter comprising a shaft, a plurality of digit wheels rotatably mounted thereon, means normally locking said shaft against rotation, means to print against said digit wheels, motive means to actuate said printing means, a first oscillating means, means to actuate said first oscillating means deriving its power from said printing motive means, means to zeroize said digit wheels upon rotating said shaft in one direction, a second oscillating means, means to actuate said second oscillating means upon actuating of said first oscillating means, means operable by said actuating means for the second oscillating means to first release said shaft locking means and thereafter actuate said second oscillating means to rotate said first shaft in said direction, and means to actuate said locking means after said shaft has rotated.

12. In combination, a counter comprising a shaft, a plurality of digit wheels rotatably mounted thereon, means normally locking said shaft against rotation, means to print against said digit wheels including a rockable shaft, means to zeroize said digit wheels upon rotating said first shaft in one direction, oscillating means, means actuatable by said second shaft to actuate said oscillating means, means operable by the means for actuating the oscillating means to first release said shaft locking means and thereafter actuate said oscillating means to rotate said first shaft in the zeroizing direction, and means to limit rotation of said first shaft to one revolution.

13. In combination, a counter comprising a shaft, a plurality of digit wheels rotatably mounted thereon, pivotal means normally locking said shaft against rotation, means to print against said digit wheels, motive means to actuate said printing means including a rockable shaft, means to zeroize said digit wheels upon rotating said first shaft in one direction, oscillating means, means deriving its power from said motive means to actuate said oscillating means, means operable by said actuating means for the oscillating means to release said shaft locking means, means operable by said oscillating means to rotate said first shaft in said zeroizing direction, and means to delay operation of said first shaft rotating means until after said shaft locking means is released.

14. In combination, a counter comprising a shaft, adapted for rotation in one direction only, a plurality of digit wheels rotatably mounted thereon, a disc secured thereto, a pinion journalled on said shaft, means normally locking said disc against rotation, electric motive means, oscillating means deriving its power from said electric motive means operable to rotate said pinion in one direction and in the opposite direction with each oscillation thereof, digit wheel zeroizing means associated with said shaft and operable upon the rotation of said shaft in the direction of shaft rotation, means to couple said pinion to said shaft upon the rotating of said pinion in the opposite direction, and means actuatable by said oscillating means to release said disc locking means prior to the rotating of said pinion in said opposite direction.

15. In combination, a counter comprising a shaft adapted to rotate in one direction only, a plurality of digit wheels rotatably mounted thereon, a disc secured thereto having a peripheral notch, a pinion journalled on said shaft, means engaging said notch for normally locking said disc against rotation, oscillating means operable to rotate said pinion in one direction and in the opposite direction with each oscillation thereof, digit wheel zeroizing means associated with said shaft and operable upon the rotation of said shaft in the direction of shaft rotation, means to couple said pinion to said shaft operable

upon the rotating of said pinion in the opposite direction, means actuatable by said oscillating means to release said disc locking means prior to the rotating of said pinion in said opposite direction, means to print against said digit wheels, and means operable by said printing means to actuate said oscillating means.

16. In combination, a counter comprising a frame having parallel side walls, a transverse shaft journalled therein, a plurality of digit wheels rotatably mounted on said shaft, a disc secured to said shaft having a peripheral notch, a pivotal member arranged for locking engagement with said disc, a pinion journalled on said shaft, pawl and ratchet clutch means adapted to couple said pinion to said shaft upon the pinion rotating in one direction, a second shaft journalled in said frame, means actuatable by the rotation of said second shaft in one direction to release said pivotal member from locking engagement with said disc notch, oscillating means actuatable by said second shaft to rotate said pinion first in an opposite direction to the direction of shaft rotation and then in the same direction as the direction of shaft rotation, means to print against said digit wheels, and means deriving its power from said printing means to rotate said second shaft.

17. In combination, a counter comprising a frame having parallel side walls, a transverse shaft journalled therein, a plurality of digit wheels rotatably mounted on said shaft, a disc secured to said shaft having a peripheral notch, a pivotal member arranged for locking engagement with said disc notch, a pinion journalled on said shaft, pawl and ratchet clutch means adapted to couple said pinion to said shaft upon the pinion rotating in one direction, a second shaft journalled in said frame, means actuatable by the rotation of said second shaft in one direction to release said pivotal member from engagement with said disc, a segmental gear actuatable to rotate said pinion, pin and slot means connecting said segmental gear with said second shaft adapted to permit release of said pivotal member before rotation of said pinion by said gear, means to print against said digit wheels, and means deriving its power from said printing means to rotate said second shaft.

18. In combination, a counter comprising a frame having parallel side walls, a transverse shaft journalled therein, a plurality of digit wheels rotatably mounted on said shaft, a disc secured to said shaft having a peripheral notch, a pivotal member arranged for locking engagement with said disc notch, a pinion journalled on said shaft, pawl and ratchet clutch means adapted to couple said pinion to said shaft upon the pinion rotating in one direction, a second shaft journalled in said frame, a plunger actuatable by the rotation of said second shaft in one direction to pivot said pivotal member out of engagement with said disc notch, a segmental gear actuatable to rotate said pinion, pin and slot means connecting said sector with said second shaft, means to print against said digit wheels, means deriving its power from said printing means to rotate said second shaft, and means to reengage said pivotal member in locking relation with said disc upon said first shaft rotating through one revolution.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,119,713	Lang	June 7, 1938
2,145,697	Pudelko	Jan. 31, 1939
2,293,934	Cooper	Aug. 25, 1942