May 13, 1930. J. W. OGDEN 1,758,461

REGISTERING MECHANISM

Filed Aug. 16, 1927 2 Sheets-Sheet 1

Fig.1.

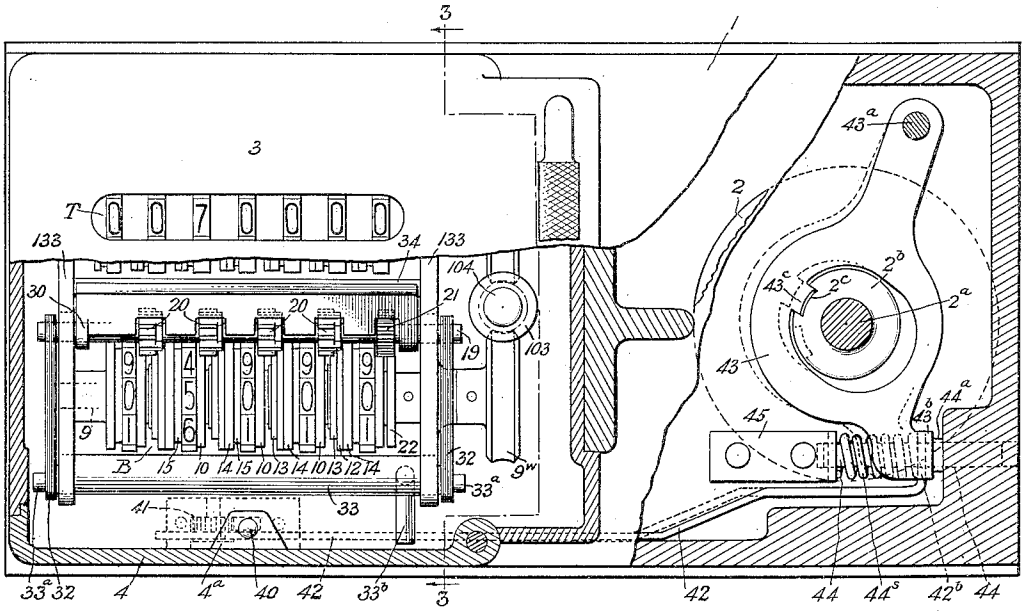
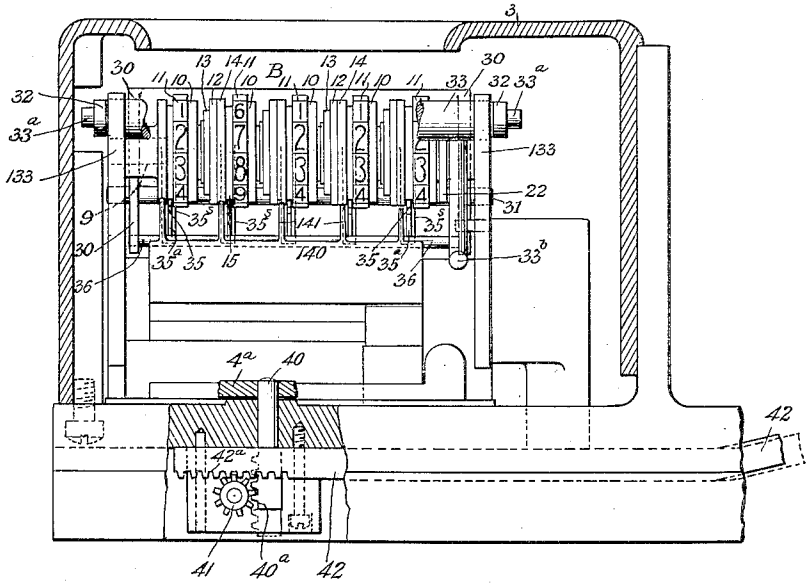


Fig.2.



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Filed Aug. 16, 1927 2 Sheets-Sheet 2

Fig. 3.

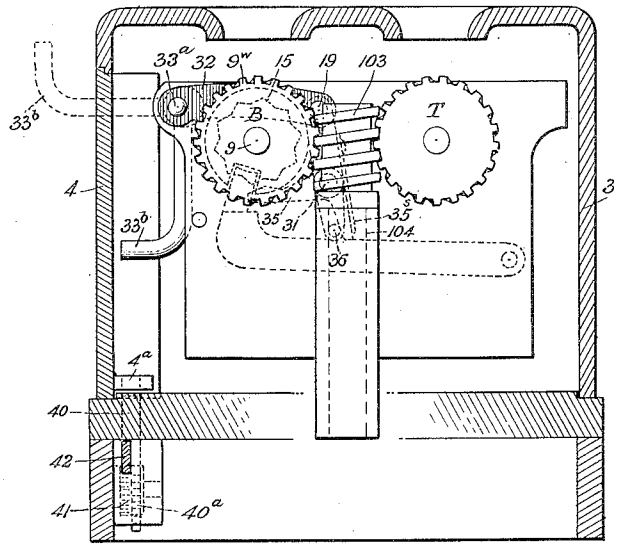


Fig. 4.

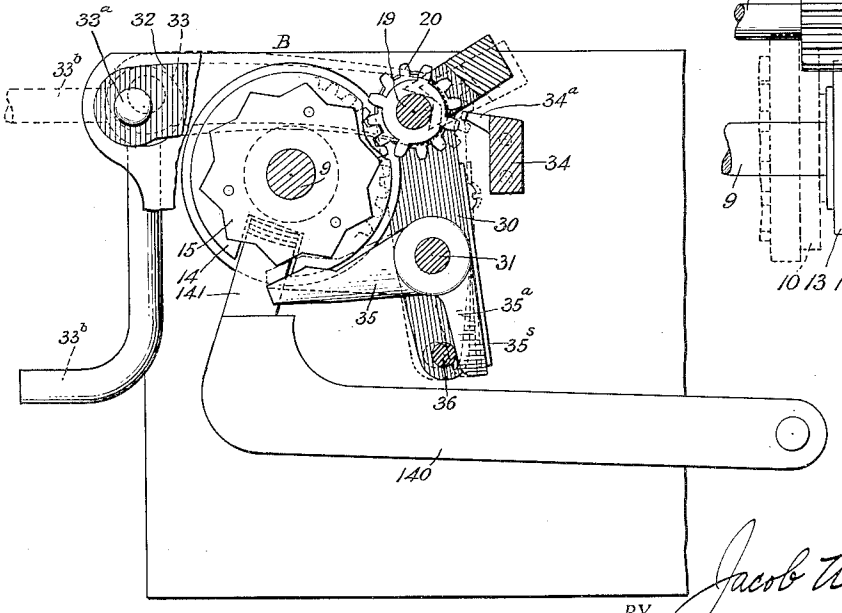
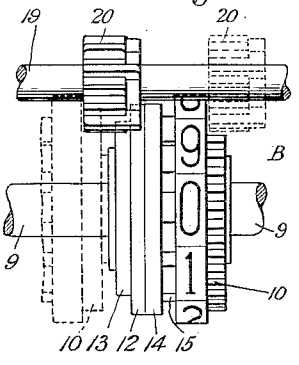


Fig. 5.



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UNITED STATES PATENT OFFICE

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REGISTERING MECHANISM

Application filed August 16, 1927. Serial No. 213,303.

This invention relates to counting or registering devices and its object is to provide novel means whereby numeral wheels may be reset when desired without possibility of errors in computation being caused by the improper displacement or improper rotation of a numeral wheel when disengaged from its actuating mechanism. The invention further provides novel means for locking the door of the case containing the registering mechanism, whereby access to the register for the purpose of resetting the numeral wheels, is prevented unless said wheels are first correctly aligned.

The invention is particularly designed for use with so-called geared counters in which the carry over is effected by pinions and gears; and it provides means for disengaging the series of pinions driving the numeral wheels and holding them fixedly while out of engagement with the gears of the numeral wheels. The invention also provides novel means to maintain the correct indexing of the numeral wheels during the time the driving pinions are disengaged from the gears.

If a geared counter, as ordinarily constructed, is set when the unit wheel is not perfectly in alignment, the alignment pawl will immediately move this wheel into alignment, but the related pinion will be held in the original position by its holding pawl, with the result that when the setting lever is returned to normal position, the Geneva gear is one tooth out and this would ultimately result in the stripping of the teeth of the Geneva gear; but my invention prevents such injury by providing novel means for preventing the operation of said setting lever unless all figure wheels are in proper alignment.

The invention in brief comprises numeral wheels, alignment disks affixed to each wheel, spring actuated alignment pawls adjacent to said disks but normaly not in engagement therewith, gears and pinions for carrying over from one numeral wheel to the next, said pinions being normally in engagement with said gears; teeth adjacent to said pinions but normally not in engagement therewith; and a setting lever and connections for simultaneously moving said alignment pawls into engagement with the alignment disks and the pinions back out of engagement with the numeral wheel gears and into engagement with the adjacent teeth when it is desired to reset the numeral wheels, and whereby said mechanisms are returned into operative position after the numeral wheels are reset.

I will explain and illustrate one practical embodiment of the invention as applied to the meter of a postage meter machine, such, for example, as shown in Pitney Patent #1,370,668, dated March 8, 1921, which will enable others to understand and use the same, but the invention may be applied to other counting mechanisms and registering devices. The novel features of construction for which protection is desired are summarized in the claims.

In the accompanying drawings:

Fig. 1 is an enlarged sectional plan view of a meter of a postage meter machine with part of the case and housing broken away, and showing the re-setting and locking mechanisms.

Fig. 2 is a partial side view of the same partly broken away and partly in section, and showing the resetting and locking devices.

Fig. 3 is a detail sectional view on line 3—3 Fig. 1.

Fig. 4 is an enlarged detail end view partly in section of the register and resetting devices.

Fig. 5 is an enlarged detail view of one numeral unit and driving pinion.

The postage meter to which this invention is shown as applied is used for registering imprints of postage indicia and also limiting the number of such imprints that may be printed on mail matter by a postage meter machine; and usually consists of a base 1 upon which is mounted a revolvable printing die 2, and a locked and sealed case 3, in which are a pair of registering or counting mechanisms T and B.

The register T registers the "total" number of imprints made by the machine and does not need to be reset to zero. The register B is to limit the number of imprints made—and such register is set according to the amount

of postage purchased. It can be set for any amount, within its range, by opening the door 4 of the case 3; and turning the numeral wheels by hand to the required amount. Each imprint made by the machine is subtracted from the amount originally set up on the register B, until that amount is exhausted and the register reads zero, whereupon the register is automatically locked, as described in the aforesaid patent, and no more impressions can be made until it is reset.

As shown the numeral wheels 11 of the register are loosely mounted upon a shaft 9 supported in end frame plates 133 within the case 3. To each numeral wheel (see Fig. 5) is attached a spur gear 10, by which it is driven; and a disk 12 provided with one gear tooth space, as usual; and a mutilated gear 13 having only two teeth, as usual. The parts 10—11—12 are all old, but in my invention I attach two other elements to the wheels, to wit:—a disk 14 provided with a deep slot, for engagement of a tooth 141 of the locking comb 140—(which functions as described in said patent); and a star wheel 15 whose function will be described later. The elements 10—11—12—14 and 15 are united to form a "numeral unit" and there are as many of such numeral units as there are numeral wheels; and these are "units," "tens," "hundreds," etc., numeral units, according to their place in the line.

Beside and parallel to the shaft 9 is a shaft 19, upon which are revolvably mounted a number of Geneva gears or pinions 20 and 21. The pinion 21 is a full gear and serves to drive the unit numeral unit directly from a gear 22 fastened to shaft 9 and driven by the mechanism of the meter, which it is unnecessary to describe. Each of the pinions 20 is mounted in the space between two adjacent numeral units and is in gear with both. Each pinion 20 has some of its teeth cut away at one end at equally spaced intervals, as shown, and the widely separated teeth on the mutilated end of pinion 20 rest on the periphery of the disk 12 of the numeral unit of lower denomination and will prevent the pinion being revolved until the tooth space in disk 12 comes in line with a spaced tooth on pinion 20 at the same time that the two teeth on mutilated gear 13 come into engagement with the full portion of such pinion and cause it to turn part of a revolution. But after moving one tooth pinion 20 is again held until at the completion of the next full revolution of elements 12 and 13, it is again turned another tooth.

The full toothed end of pinion 20 is in mesh with the full gear 10 of the next numeral unit in the series, so that each time pinion 20 is moved one tooth such adjacent numeral unit will also be moved one tooth; and as the amount of movement of the numeral unit is equal to $\frac{1}{10}$th of a revolution, and as a pinion 20 is placed between each pair of adjacent numeral units, it follows that each numeral wheel in the series will be advanced one tooth or $\frac{1}{10}$th for every full revolution of the numeral wheel of the next lower denomination.

The shaft 9 may be driven by suitable mechanism from the spindle 2^a which carries the printing die (not shown) and may be operated as described in the aforesaid patent. As shown shaft 9 is driven by a worm gear 9^w meshing with a worm 103 on a spindle 104 which may be operated as described in Pitney Patent No. 1,603,402 of October 19, 1926, and does not need any further description herein.

If the relative positions of shafts 9 and 19 were invariable and if the elements composing the numeral units were integral, it would not be possible to move any of the numeral wheels independently, because they are all geared together, and can only be moved through the movement of the units wheel. But it is frequently necessary in postage meters, and other registering devices, to set up some initial number, or to reset the register to zero, and for this purpose in the present invention the shaft 19 carrying the pinions 20 and 21 is mounted in a frame 30 which is pivoted on a shaft 31 (Fig. 4) and is connected by links 32 with eccentric pins 33^a on the ends of a shaft 33, which is shown as mounted in the end plates 133 of the frame in which shafts 9 and 31 are mounted. To the shaft 33 is attached a handle or lever 33^b by which it can be rocked when the door 4 is open.

Fastened to the frame of the register and parallel to the shaft 19 is a bar 34 having a number of projecting teeth 34^a so located that they will respectively engage with tooth spaces in the related pinions 20 and 21 when the frame 30 is rocked away from the numeral units. The bar 34 is so adjusted that the teeth 34^a will enter the tooth spaces of the pinions before the latter are entirely out of mesh with the gears, and hold the pinions 20 and 21 in the correct positions for meshing with the gears of the numeral units when the frame 30 is moved back to normal position.

When the pinions are rocked out of engagement with the gears, as described, the numeral units are free and independent and may be turned by hand upon the shaft 9 in either direction; but in order to curb this freedom and cause the numeral wheels to come to rest in any one of ten positions (corresponding to the ten numerals on their faces) the star wheels 15, before mentioned, and related aligning pawls 35 are employed.

Each pawl 35 is pivoted on the shaft 31 and has a downwardly projecting arm 35^a, which is acted upon by a spring 35^s attached to frame 30. Said springs tends to hold the pawls in contact with the star wheels 15. A rod 36 is attached to the lower part of the frame 30 and is adapted to contact with the arms 35^a of pawls 35, and cause them to hold

the pawls out of engagement with the star wheels 15 when the rocking frame 30 is in normal position (i. e. when the pinions 20 are meshed with the gears of the numeral units) but when the frame 30 is rocked to disengage the pinions from the gears the rod 36 is also disengaged from the arms 35^a, and permits the springs 35^s to move the pawls 35 into engagement with the star wheels 15.

The operation of resetting

To reset the register the door 4 of the case 3 is unlocked and opened; then the handle 33^b is raised to the position shown in dotted lines in Figs. 3 and 4, thus rocking shaft 33 and causing the links 32 to rock the frame 30 and move shaft 19 away from shaft 9, thereby disengaging the pinions 20 and 21 from the numeral unit gears, and permitting the pawls 35 to engage the star wheels 15 as shown in dotted lines in Fig. 4. The several numeral wheels may then be turned in either direction, but the pawls 35 engaging the star wheels 15 will prevent the numeral wheels from coming to rest in any other position except one of the ten divisions that correspond to a numeral shown at the sight opening in the counter case.

When the desired setting is obtained the handle 33^b is turned down to vertical position as shown in full lines in Figs. 3 and 4; this restores the frame 30 to normal position, thereby re-engaging the pinions 20 and 21 with the numeral unit gears, and disengaging the pawls 35 from the star wheels 15. The handle 33^b is so bent that when the door 4 is closed, it will keep the handle in normal position and prevent any accidental shifting of the resetting mechanism.

The resetting devices will function perfectly, as described, only when all of the numeral wheels are at rest and in alignment at the end of a counting operation, and before the numeral unit starts to turn to the next figure.

If the handle 33^b were lifted when the numeral unit had started to turn, the pawl 35 acting on the related star wheel would shift the numeral unit either backward or forward till one of its figures would line up at the sight opening, but the pinion 20, between the "unit" unit and the "tens" unit, being held by the tooth 34^a of bar 34, could not move with it, consequently when the handle 33^b was restored to normal the correct relation between the numeral unit and the pinion would be destroyed; and the register would be in error by the amount that the "unit" numeral wheel was out of line when the pinions were moved out of gear. To prevent any error of this kind occurring, I have provided an auxiliary lock for the door 4 of the register case, which lock will permit the door to be opened only at the end of a count and when all the numeral wheels are in correct position.

The auxiliary lock

The said lock comprises a bolt 40 vertically disposed within the base of the meter and adapted to engage a lug 4^a on the door 4. The bolt 40 has several rack teeth 40^a on its lower end, which mesh with a pinion 41 mounted in the base of the meter. The pinion is also engaged by rack teeth 42^a on a rod 42 which is horizontally disposed in the meter base and extends toward a pin 44 in the meter base adjacent the spindle 2^a.

When the rod 42 is moved toward the left (Figs. 1 and 2) it will turn pinion 41 by the rack 42^a, and pinion 41 will move bolt 40 upward through the base of the meter and cause it to engage a hole in the lug 4^a, on the bottom of the door 4, thus preventing access to the counter.

The shaft 2^a of the printing die 2 (Fig. 1) is the member of the postage meter whose revolutions are registered by the register, and said shaft is operatively connected with the register by a train of gears (not shown), as disclosed in the aforesaid patents. On the shaft 2^a is a flange or disk 2^b having a slot 2^c adapted to be engaged by a lug 43^c on a lever 43 which is pivoted at 43^a and has a bent end 43^b through which passes pin 44. Said pin has a collar 44^a and is slidable in a hole in the base of the meter, as described in said patents. A guide piece 45 holds the pin in alignment with the hole, and a spring 44^s tends to force the pin outward as far as the collar 44^a will permit.

The lever 43 has an opening for the accommodation of the disk 2^b, and the projection 43^c is adapted to enter the slot 2^c in disk 2^b, at the end of each revolution of the die shaft 2^a; and it will enter and prevent revolution of the shaft whenever the pin 44 is allowed to seat on its collar 44^a as indicated in full lines in Fig. 1.

The end 43^b of lever 43 and the end 42^b of the rod 42 are both engaged with the pin 44 and are both acted on by the spring 44^s, and when the pin 44 is pushed inwardly the lever 43 will be swung on its pivot 43^a and release the shaft 2^a and the rod 42 will be moved inwardly, as indicated in Fig. 2, and lock the door 4.

When the postage meter is in use, and the die making imprints, the pin 44 will be pressed back as shown in dotted lines in Fig. 1, allowing the die shaft 2^a to revolve; but upon the removal of the meter from the machine upon which it operates, the pin 44 is forced outward by the spring 44^s, and lug 43^c will enter the slot 2^c and lock the shaft 2^a. The parts are shifted to this position at the end of a counting operation with the unit wheel of the counter properly indexed on one of the ten figures.

The rod 42 can not be moved to the right withdrawing the bolt 40 unless the rocker 43 has its lug 43^c seated in the slot 2^c of the disk

2^b; and as this can only occur when the die shaft 2^a is at rest in its normal position at the end of a counting operation the mistake of resetting the counter while the figure wheels are misplaced can not occur.

The locking of the die shaft 2^a by means of the rocker 43 and pin 44 is a regular necessary function of the postage meter and is fully described in the aforesaid patent; and I use this mechanism to operate bar 42 and the auxiliary door lock as above described. Other means can be used to operate the lock when the invention is applied to other registers.

I claim:

1. In combination with a meter comprising a casing having a door; means for locking the door; a register in the casing provided with numeral wheels; means for carrying over from one numeral wheel to the next; a driven shaft; means for operating the register from said shaft; and means for locking said shaft; of operable connections between the shaft locking means and the door locking means whereby the door can not be opened to permit access to the register unless all the numeral wheels are in proper alignment.

2. In combination a casing having a door; a register in the casing having numeral wheels; means for carrying over from one numeral wheel to the next; a setting lever and connections whereby the carry over device may be disengaged to permit the numeral wheels to be reset when the door is open; means for operating the register; means for locking the register operating means, and means for locking the door controlled by the register operating means, whereby the door can not be opened to permit access to the register unless all the numeral wheels are in proper alignment.

3. In a meter, a casing having a door; means for locking the door; a register in the casing provided with numeral wheels; means for carrying over from one numeral wheel to another; a setting lever and connections whereby the carry over means may be disengaged to permit the numeral wheels to be reset when the door is open; a printer carrying shaft; means for operating the register from said shaft; means for locking the said shaft; and operable connections between the shaft locking means and the door locking mechanism, whereby the door can not be opened to permit access to the register unless the printer carrying shaft is locked and the numeral wheels are all in proper alignment.

In testimony that I claim the foregoing as my own, I affix my signature.

JACOB W. OGDEN.