

PUBLISHED
MAY 25, 1943.
BY A. P. C.

B. BERIA
CASH REGISTER
Filed July 22, 1941

Serial No.
403,580
2 Sheets—Sheet 1

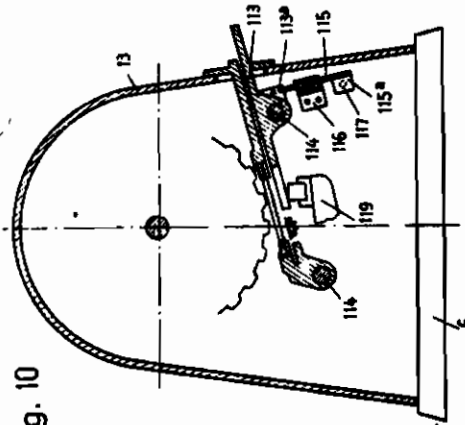
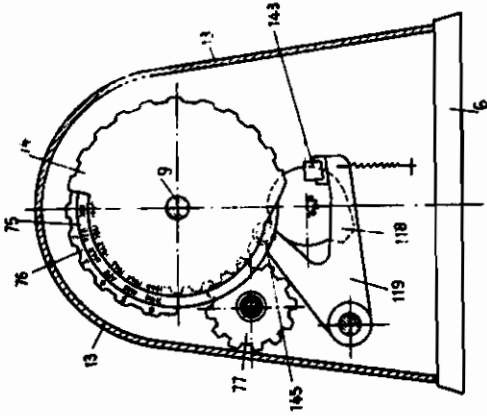


Fig. 10

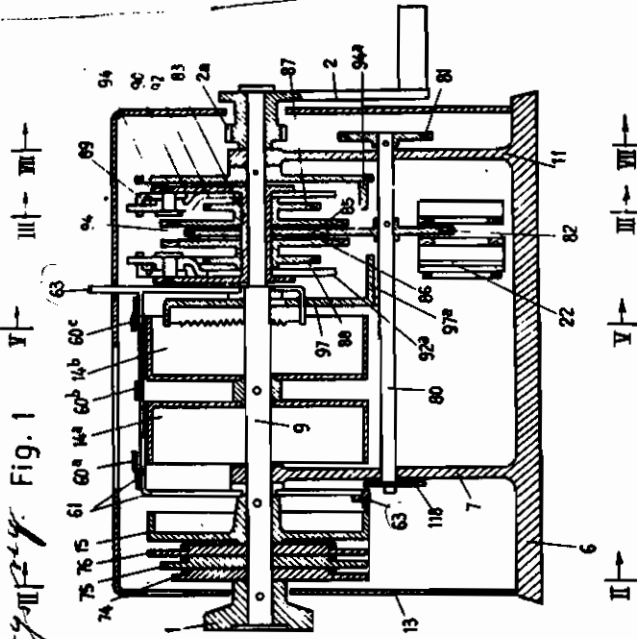


Fig. 1

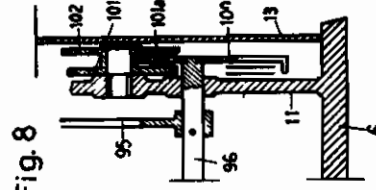


Fig. 8

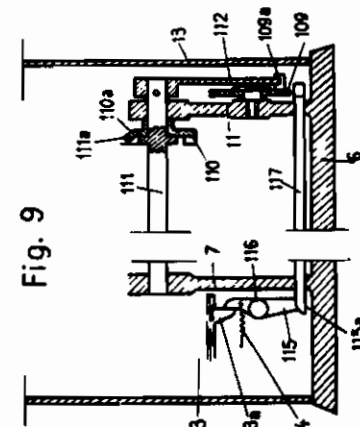


Fig. 9

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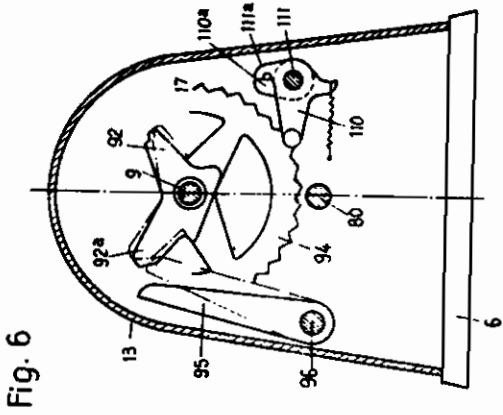


Fig. 6

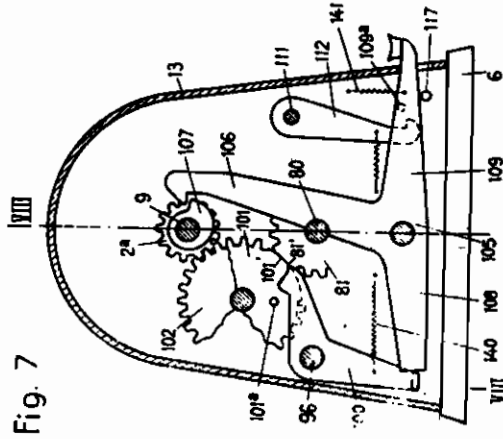


Fig. 7

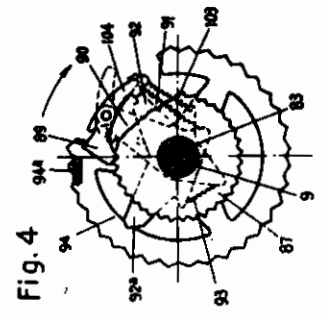


Fig. 3

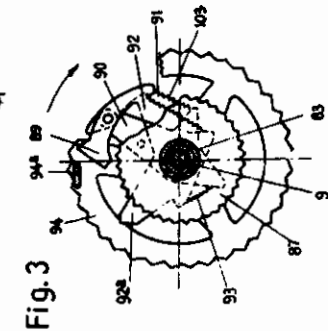


Fig. 4

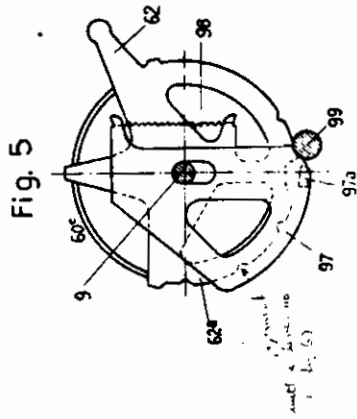


Fig. 5

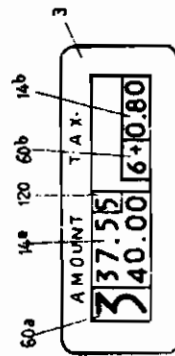


Fig. 11

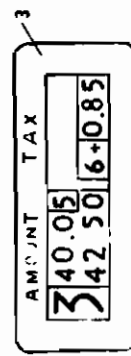


Fig. 12

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ALIEN PROPERTY CUSTODIAN

CASH REGISTER

Biagio Beria, Turin, Italy; vested in the
Alien Property Custodian

Application filed July 22, 1941

This invention relates to a cash register particularly adapted for salesmen, on the operation of which an amount in proportion to the amount of sale, for instance a per cent tax, is indicated on the check to be delivered to the customer and added to the amount of sale by means of a totalizer.

The purpose of the present invention is more especially to provide the cash-registers of the character above referred to with means for indicating the accumulation of the per cent amounts (for instance to be paid as sales tax) on the effected sales. The check is given to the customer as a receipt for the tax due on the amount of sale. The sealed totalizer is periodically inspected by the finance officer thus determining the amount to be paid by the salesman to the revenue office.

The tax being a percentage of the amount of sale, an amount of sale, which is intermediate between two fixed values, is taxed on the lower of these values. Thus, for instance, if the tax is 2% and the lowest tax amount is 5 cents and increases by fives, the lowest tax amount will correspond to a sale amount between 0 and 2.50, and thus for all sale amounts from 2.55 to 5 dollars a 10 cents tax should be paid, that is to say a 10 cent tax is due on all sale amounts between 2.55 and 5 dollars. The salesman sets the cash-register on the numerals which comprise the amount of sale. If the latter is, for instance, 3.75 dollars, the salesman sets the register on the numerals "2.55-5.00 dollars", whereupon the indication is given to the customer that the tax due is 10 cents and this amount is printed on the check and accumulated in the totalizer. On setting the register on the amount of sale, the register is simultaneously prepared for printing the corresponding tax amount and accumulate it in the totalizer. The salesman introduces then with his left hand the check to be printed through a slot in the register, operates the crank handle with his right hand thus recording the tax on the check and accumulating it in the totalizer. No spring is used in this improved cash-register for operating the totalizer, thus preventing the register from becoming unserviceable or working in an inexact manner owing to wear of the springs.

Referring to the drawings:

Fig. 1 is a longitudinal section through the shaft of the setting drums, the printing device and other parts being omitted.

Fig. 2 is a partial sectional view of the printing device on line II—II of Fig. 1.

Fig. 3 is a sectional view on line III—III of a detail of the operating mechanism;

Fig. 4 shows the mechanism of Fig. 3 in a different position;

Fig. 5 is a sectional view on line V—V of Fig. 1 of another detail.

Fig. 6 is a sectional view on line III—III of Fig. 1 of the lock omitted in Figures 3 and 4.

Fig. 7 is a sectional view on line VII—VII of Fig. 1 of a modified construction of the lock.

Fig. 8 is a sectional view on line VIII—VIII of Fig. 7.

Fig. 9 shows the lock which is engaged when certain members are in an intermediate position.

Fig. 10 shows in connection with Fig. 2 the printing device.

Figures 11 and 12 show two notations of amounts of sale and tax amounts.

The cash register is arranged in one piece casing 13 comprising a base plate of rectangular section, two vertical side walls, a slightly inclined front and rear wall and an upper dome-shaped cover. A setting wheel 1 projects from the left side of the machine, a crank handle 2 is fitted on the right side. Through a glass window 3 on the right side of the front wall (Figs. 11 and 12) is observable by the customer on the left side the amount of sale set by the salesman and on the right side the tax corresponding to said amount of sale. On the rear side of the register the salesman can see through a glass window 3 the amounts set by him.

Instead of the setting wheel and glass window a pointer could be used which is set by the salesman and indicates the amounts on a plate or the like. Two transversal walls 7 and 11 in the casing but not extending throughout it carry the main shaft 9 of the register, on which are fitted the setting wheel 1 and the crank handle 2. The main shaft 9 carries moreover a printing drum 15 for printing the tax amount and indicating drums 60a, 60b, 60c. Finally on the main shaft 9 are loosely mounted three drums 74, 75, 76 adapted to set and print the date. The drums 74, 75, 76 are controlled by means of pinions 77 (fig. 2) the hollow shafts of which are loosely mounted in each other. The shafts of the pinions are operated by means of a three steps key, each one of these steps operating each one of the three shafts of the pinions. This date key is introduced through a slot in the casing 13. The main shaft 9 extends throughout the casing 13 and projects on both sides therefrom. The main shaft carries moreover the operating wheels for the totalizer. The hub of the crank handle 2 is loosely mounted on the main shaft 9. The totalizer drive wheels are operated by the crank

handle 2 through a secondary shaft 80, on which is keyed a gear 81 meshing with an intermediate gear 101, integral with a gear 102 meshing with a pinion 2a integral with the hub of the crank handle 2. On the secondary shaft 80 is secured a gear 82 transmitting the rotating movement from the crank handle 2 to the totalizer. The totalizer driving means consist of a sleeve 83 fitted on the main shaft 9 and carrying at its central part a gear 84 permanently meshing with the gear 82, and gears 85 and 86 loosely mounted, and permanently coupled with the totalizer 22 the gear 85 being integral with a wheel 87 and gear 86 with a wheel 88. On the periphery of each of the wheels 87 and 88, which are similar and symmetrically arranged (figures 3 and 4) are formed forty notches and a pawl 89 coacts with each of the wheels. Each pawl is arranged on a lever 90 on the sleeve 83 and is subjected to the action of a spring 91 connected to the lever 90 and pawl 89 and tending to hold the pawl in the raised position relatively to the wheel 87 or 88. The above described mechanism serves to indicate 40 different amounts of tax for amounts of sale comprised between 0 and 100 dollars; the amounts of sale being subdivided in amounts increasing by 2,50 dollars.

For each one of the wheels 87, 88 is further provided a lever 92 rotatably mounted on the sleeve 83 and connected by means of a spring 93 to the lever 90. The lever 92 is supported on one end of the pawl 89 and holds the latter in the lowered position (fig. 4) in which it is brought by an adjustable stop against the action of a spring 91 on operation of the crank handle 2. The pawl is maintained in said position until it is disconnected from the lever 92 by means of a device which will be later described and returned to the position shown in fig. 3 by means of a spring 91. The lever 92 is provided with an extension 92a, on which a finger 95 (fig. 6) abuts at the end of a cycle of the register, that is to say at the end of a full rotation of gear 84. The finger 95 is keyed on a shaft 98 and is given an oscillating movement through a cam at the end of each cycle as hereafter described. A gear 94 keyed on the main shaft 9 (figures 1, 3, 4) is provided with a stop 94a fast thereto and coacting with gear 85. When the setting wheel 1 is set on a given amount, that is to say when this wheel is rotated through a certain angle, the main shaft 9 with gear 94 keyed thereon is rotated through the same angle distance and the stop 94a is brought to a corresponding angular position. The gear 85 on the movement of the crank handle 2 performs a certain idle rotation according to the position of the stop 94a before abutting the latter; the idle rotation to be effected on operation of the crank handle is thus determined by the setting wheel 1. In a similar manner as above described, for the gear 86 is provided a stop 97a (figures 1, 5) carried by a sector 97, which is connected to a crosspiece 61 on the drum 60a-60b-60c controlled by means of the handle 62. The connection between sector 97 and crosspiece 61 is not a stiff one; on the contrary these two members are resiliently connected together by means of a spring 98, which holds the stop 97a in the ineffective position, that is to say in the position, in which it is out of the path of the finger 95, which is the case when the drum 60a-60b-60c is not set. When said drum is set, the sector 97 abuts a stationary stop 89 thus bringing its stop 97a in the effective position.

The amounts of sale, as already said, are arranged in amounts of 2,50 dollars so that, for instance, for an amount of sale between 37,55 and 40,00 a tax amount of 0,80 cents and for an amount of sale between 40,05 and 42,50 dollars a tax of 0,85 dollars should be added. The setting wheel 1 is moved in such manner that both amounts within which the amount of sale is comprised may be viewed one above the other in the glass windows 3. The lowest value of the next higher range (40,05 dollars) is thus 5 cents higher than the highest value of the lower range (40,00 dollars). In order that the same indication of the amount on the indicating drum 14a-14b may be used in both cases, a small plate 120 bearing figure "5" is disposed in the middle of the window 3 where the cent indication is observable, this plate conceals the last figure of the upper amount (viz. of the lower amount of the range). The amount "40,00" printed on the drum 14a as the highest amount (fig. 11) is therefore in the next range the lowest amount "40,05" (fig. 12). The same type "40,00" on the indicating drum 14a can thus be used in both cases. The indicating drum 60a on the left looking from the front side of the register is connected with the indicating drum 60c on the left looking from the rear side of the register and both drums are, as well as a third indicating drum 60b connected thereto, loosely mounted on the main shaft 9; the three indicating drums 60a, 60b and 60c are, as it has already been said, controlled through the hand lever 62, independently of the setting effected by the setting wheel 1. The three drums are adapted to set, indicate, print and accumulate the hundred dollar amounts. The big figures 1, 2, 3 . . . observable on the left through the window, make the amounts 100, 200, 300 . . . visible on the front and rear side; the drum 60b bear the corresponding tax amounts 2, 4, 6 . . .

Fig. 11 shows an amount of sale between 337,55 and 340, for which a tax amount of 6 plus 0,80=6,80 (drum 60b) is indicated, printed and accumulated.

The above described apparatus works as follows: On setting the setting wheel 1, the stops 94a and 97a are brought into the angular position corresponding to the position of the setting wheel. On the following rotation of the crank handle 2 and gear 84 the levers 90 and 92 are also rotated, the gears 85 and 86 however are not yet rotated and remain in the rest position until the pawl 89 on the lever 90 abuts the stop 94a and the pawl 89 on the other lever 92 abuts the stop 97a of the sector 97 if the drum 60a-60b-60c has been set. As soon as the clutch 88 abuts its stop, it falls into a notch in the wheel 87 (or 88), which is fixedly connected with the gear 85 (or 86) and throws into rotation the wheel 87 together with gear 85 or the wheel 88 with its gear 86. At the end of this cycle the lever 92 is stopped, the finger 95 abuts the nose 92a thus disengaging the clutch 89. At the end of this first cycle, viz. after the first full rotation of the crank handle 2 and gear 84, the gears 85 and 86 have performed a rotation, the angle of which corresponds to the setting of the setting wheel 1. The register is thus ready for the next cycle, which is effected through the next rotation of the crank handle 2.

The fingers 95 are, as it has already been described, keyed on a shaft 96 (Fig. 7), which is given an oscillating movement when the crank handle is operated. For this purpose a crank lever 108 is keyed on the shaft 96 and subjected

to the action of a spring 140, this lever being locked when the register is inoperative. The shaft 88 is moved at the end of a cycle by means of a pin 101a on a gear 101, which is operated by the crank handle 2. The pinion 2a on the crank handle 2 does not mesh directly with gear 101 but engages a gear 102 (Figures 7, 8) which is fast with gear 101, both gears being fitted on a common hub.

The gear 102 is provided with an indentation on its whole periphery while the gear 101 is indented only on part of its periphery so that there is a non indented section 101'. Gear 101 meshes with gear 81 fixed to the secondary shaft 80; gear 81 is, similarly to gear 101, deprived of teeth on a section 81'. Therefore, at the end of a cycle, while the movement of the crank handle 2 is continued and the intermediary shaft 80 after having performed a full rotation through 360° is stopped, gear 101 performs a slight rotation, through which the crank lever 100 is caused to oscillate at the end of the cycle thus rotating the shaft 96 and causing the finger 95 fixed thereon to oscillate so that the pawl 89 is returned into its disengaged position releasing the spring 91.

The setting wheel 86 is rotated not only when setting the reading drums 60a—60b—60c but also on any cycle of the machine for effecting a carrying operation. The springs 91 and 93 of the levers 90, 92 are so calculated that each of them can move the pawl 89, so that breakage of a spring does not hinder the working of the register. In order to prevent stopping of the machine through breakage of both springs, a third spring 103 is provided between the lever 92 and a small lever 104 mounted on the same pin as the pawl 89 and acting on the clutch end. This spring 103 can also be independently used, that is to say it can replace the springs 91 and 93. On breakage of the spring 103 the further working of the register, that is to say printing of the checks would be made prevented owing to the fact that the lever 104 in this case would take its lower position under the action of gravity and centrifugal force and oscillate outwards abutting a stop, which hinders the further movement of the crank handle 2.

The register is provided with a lock which prevents operation of the crank handle when the setting means are in an undesired intermediary position between two indicating positions and prevents further that during a cycle the setting means may be displaced; the setting means are thus maintained in their position during working of the register. The lock is provided with a three-arm lever 105 (Fig. 7) subjected to the action of a spring 141. The arm 106 of this lever 105 engaged at its end in the form of a pawl a tooth on a cam 107, fast on the main shaft and integral with the hub of the crank handle and therefore with the drive pinion 2a. The engagement of the pawl in the tooth on the cam 107 prevents rotation of the crank handle. The second arm 106 of the lever 115 bears at its front face on one arm of the lever 100 and moves the latter to the left, so that the other arm of lever 100 is moved away from the path of pin 101a on gear 101. The third arm 109 of lever 105 projects somewhat outwards from the casing 13 and carries a key. On pressing said key, the lever 105 is caused to oscillate in a clockwise direction and the cam is thus disengaged from the lever 105 owing to the fact that the pawl on the arm 106 of lever 105 is disengaged from the tooth on the cam 107. At the same time the lever 100 is disengaged through the

arm 108 of the lever 105, so that the lever 100 under the action of the spring 140 oscillates on the shaft and its lower end is carried above the arm 108 thus preventing the backward oscillation of lever 105 produced by the spring 141 and locks the lever 105. Locking of the lever 105 is maintained to the end of the cycle, that is to say until the pin 101a of gear 101 abuts a nose on the upper arm of lever 100, thus causing the latter to oscillate in a clockwise direction on the shaft 86, so that the lower part of lever 100 oscillates to the left against the action of spring 140 and slides away from the arm 108 thus disengaging the lever 105, which, under the action of the spring 141 returns to its unlocked position and locks the lever 100 as above described.

The lever 105 cannot oscillate when the setting drums are not in their exact position, which for instance for drums 14a—14b is determined by the engagement of a spring pawl 110 in one of the forty notches provided on the periphery of the wheel 94 (Fig. 6), each of these notches corresponding to one of the forty positions of drums 14a—14b. The clutch 110 is loosely and rotatably mounted on a shaft 111, on which is also fitted a locking pawl 112 (Fig. 7), engaging through a stop a pin 109a on the arm 109 of the lever 106 as soon as the shaft 111 is rotated. The shaft 111 is thus carried into rotation through the pawl 110, which slides on the periphery of the wheel 94, passing from one of the forty notches in the wheel 94 to the next, through the top between two notches and abutting with its nose 110a a nose 111a on the shaft 111 thus carrying along in its movement the shaft 111 and setting it into rotation when passing on the top of a tooth. A similar pawl acts on the setting of the drum 60a—60b—60c on the sector 62a of lever 62 (Fig. 5) which is also provided with notches. When one of the two pawls is on the tooth top, viz. between two adjacent notches, the nose on the pawl engages a pin 109a and prevents oscillation of the three-arm lever 105, also when the key provided on the arm 109 of the lever 105 is depressed.

The printing device (Figures 2, 9, 10) is provided with a slide 113 carrying a ribbon and fitted on two pins 114 to the printing position thus remaining constantly in the inserted position. Before the slide is fully fitted in, the crank handle 2 effecting the printing cannot be moved, a projection 115a on a lever 115 displacing under the action of a spring 114 a rod 117 articulated at the lower end of lever 115 under the arm 109 of lever 105. The lever 115 is rotatably mounted on an angle bar 110 secured to the partition 7. When the slide is fully fitted in, its nose 113a causes the lever 115 to oscillate, which thus disengages the rod 117 the latter being left to the action of the spring 144, which moves the rod 117 away from the path of arm 109, so that the arm 109 of lever 105 is disengaged and a print is effected at the end of each other rotation of the crank handle.

The printing block 143 is arranged on one end of one arm of a crank lever 119, the other arm of which carries a guiding roller 145 co-acting with a cam 110, keyed near the partition 7 on the secondary shaft 80. On rotating the secondary shaft 80, viz. the crank handle 2, the raised portion of the cam on passing on the guiding roller causes the lever 119 to oscillate thus effecting printing on the check slipped into the slide by means of the printing rollers 15

(tax amount) and 74 to 16 (date). The ribbon may be movable or stationary.

The indicating device is constituted by an indicating drum 80a-80b-80c passing in front of a glass window in the casing 13. The indicating drum 15 is rotatably connected to the main shaft and is thus rotated on rotation of the setting wheel 1. The indicating drum carries forty amounts of sale increasing by 2,50 (0 to 2,50; 2,55-5,00; 5,05-7,50 etc) and the corresponding proportional tax amounts (5, 10, 15 . . . etc. cents), so that on setting the setting wheel 1

the amount of sale and the corresponding tax amount can be viewed by the customer through the window 3. The subdivision of the indicating drum and the mechanisms for accumulating and printing the tax amounts may obviously be modified at will and any other number of amounts of sale and tax may be used; the members (wheels, segments) provided with notches should in this case have a number of notches corresponding to the number of amounts.

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