Nov. 1, 1955 E. KOMUSIN 2,722,381

POSTAGE METER PRINTING DEVICE

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Fig. 1

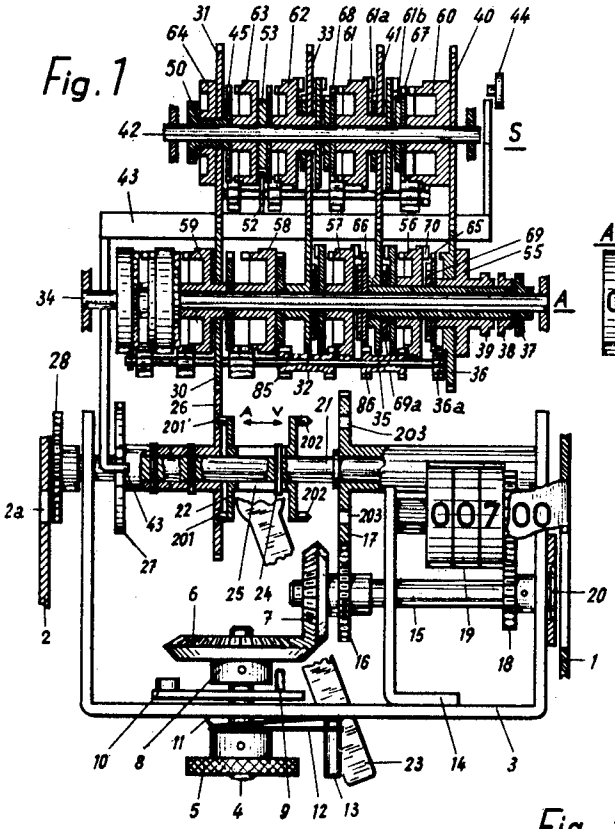


Fig. 7

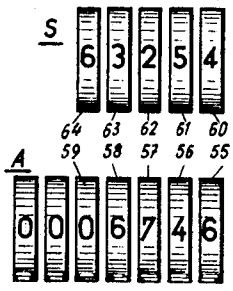


Fig. 8

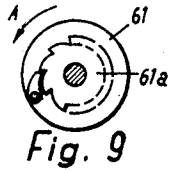


Fig. 9

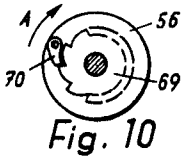


Fig. 10

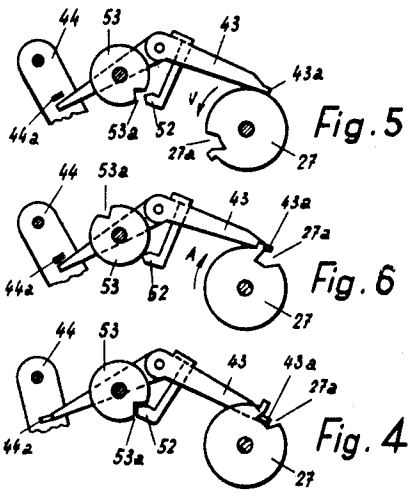


Fig. 5

Fig. 6

Fig. 4

Fig. 3

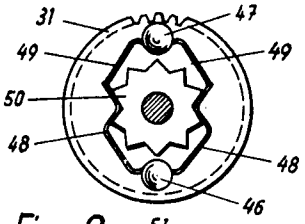
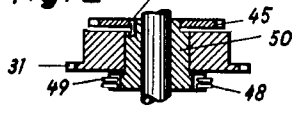


Fig. 2



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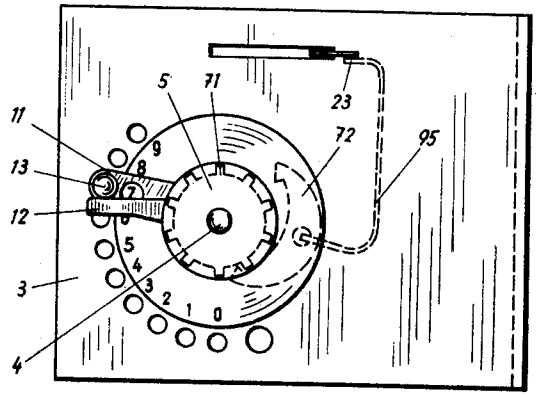
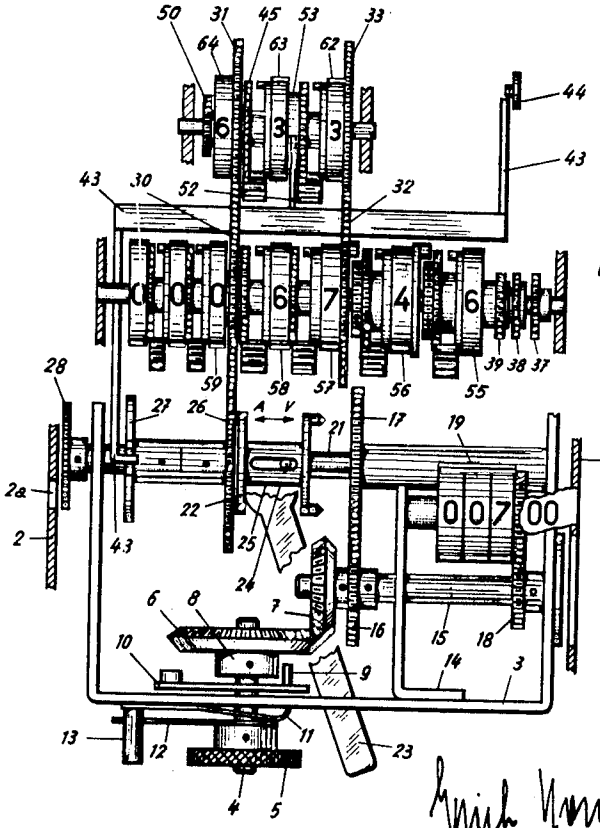


Fig. 12



S

Fig. 11

A

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Fig. 13

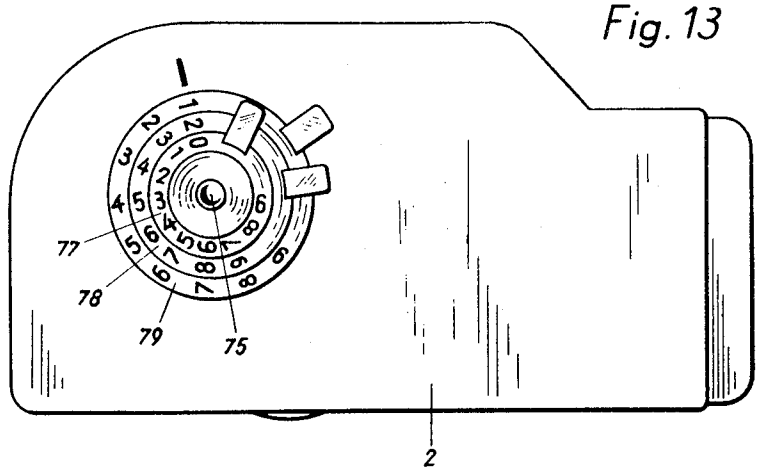
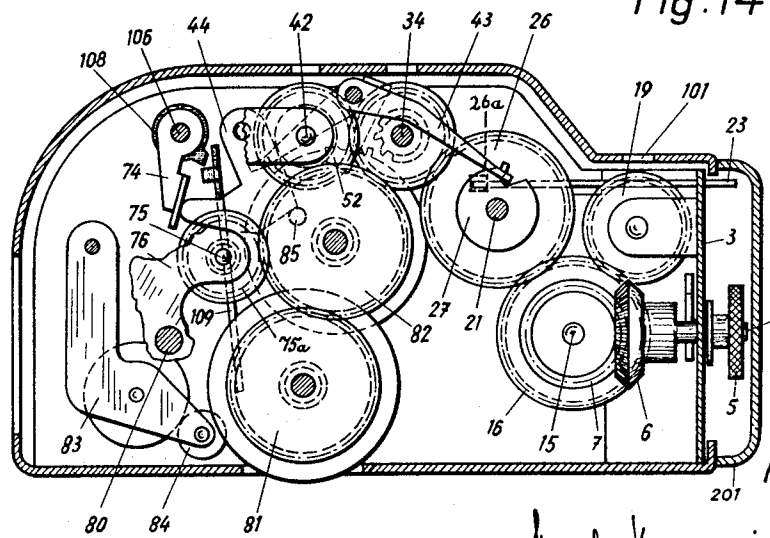


Fig. 14



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Fig. 15

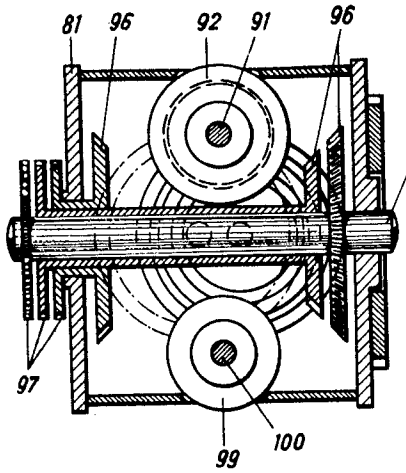


Fig. 16

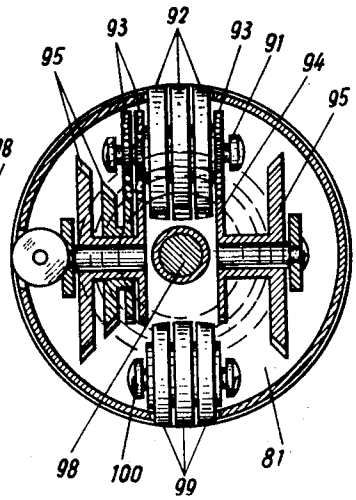


Fig. 17

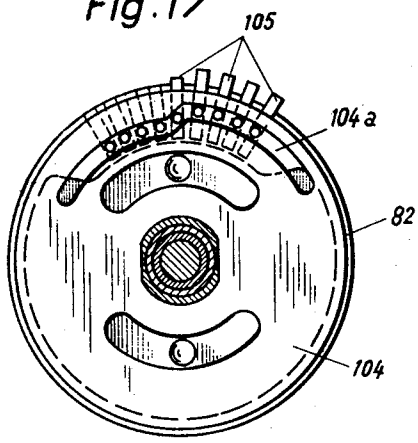
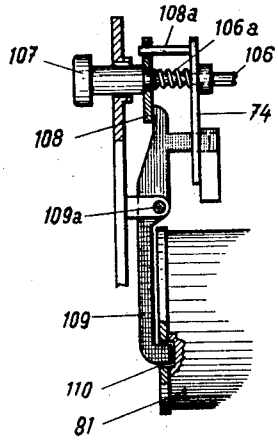


Fig. 18



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United States Patent Office

2,722,381

Patented Nov. 1, 1955

2,722,381

POSTAGE METER PRINTING DEVICE

Erich Komusin, Frankfurt am Main, Germany, assignor to Telefonbau und Normalzeit G. m. b. H., Frankfurt am Main, Germany

Application September 7, 1954, Serial No. 454,406

10 Claims. (Cl. 235—101)

This invention relates to apparatus for printing monetary amounts, and more particularly to apparatus of the kind used for franking letters and/or other mail by making impressions of monetary amounts which take the place of post stamps.

Apparatus of this kind can only be used by arrangement with the proper authorities, e. g. the Postmaster General, and in order to safeguard the authorities' interests, the apparatus must be such that when the aggregate value of the impressions made reaches a predetermined figure, a lockout mechanism becomes operative making the apparatus unusable until re-set or preset, i. e. set for using up another pre-determined amount. Re-setting or presetting is effected by the postal authorities on payment of an appropriate amount.

It is a general object of this invention to improve apparatus of the above character.

Another object of this invention is to provide an apparatus of the aforementioned character which facilitates the checking operations which must be made from time to time by the postal authorities.

An apparatus of the aforementioned character is described and claimed in United States Patent 2,187,456 to Erich Komusin, issued January 16, 1940. Printing Apparatus, assigned to the Telefonbau und Normalzeit G. m. b. H., Frankfort-on-the-Main, Germany.

It is another object of this invention to provide an improved apparatus of the general character described and claimed in the above United States patent.

United States Patent 2,187,456 is concerned with a franking machine which includes a printing cylinder having adjustable type wheels. These type wheels can be adjusted to imprint any desired amount, or amounts, of postage, and the apparatus is provided with a counter or adding totalizer indicating at any time the aggregate amount of impressions made. The total amount of impressions made must be less than the amount for which the apparatus has been pre-set by the postal authorities. When or before the aggregate amount of impressions made is equal to the amount for which the apparatus has been pre-set, an automatic locking mechanism becomes operative, precluding further use of the apparatus, e. i. locking it against making further impressions.

It is one object of this invention to provide an apparatus of the aforementioned character having means which facilitate to determine the balance which remains upon pre-setting of the apparatus for one or more than one amount, and upon use of the apparatus for making a number of impressions.

Another object of the invention is to provide an apparatus of the aforementioned character having means for indicating the aggregate of all amounts for which the apparatus has been pre-set by the postal authorities.

Apparatus of the aforementioned character are capable of making imprints of various amounts up to an upper limit for one single imprint which limit may be, for instance, $9.99.

It is another object of this invention to provide a franking machine including a locking mechanism which becomes operative and precludes further use of the machine when the sum total of all the amounts for which the apparatus has been pre-set, minus the sum total of all imprinted amounts is equal to, or less than, the highest amount, e. g., $9.99, which can be imprinted in one single printing operation.

The foregoing and other general and special objects and advantages of the invention will more clearly appear from the ensuing particular description of the invention, as illustrated in the accompanying drawings wherein

Fig. 1 shows a first embodiment of the invention including an adding totalizer and a subtracting totalizer in part in top plan view and in part in horizontal section;

Fig. 2 is a section across one of the number wheels of the subtracting totalizer;

Fig. 3 is a side elevation of the number wheel shown in Fig. 2;

Figs. 4 to 6, inclusive, illustrate a locking mechanism forming an integral part of the structure of Fig. 1 in three different operating positions;

Fig. 7 shows the number of wheels of the subtracting totalizer in front elevation;

Fig. 8 shows the number wheels of the adding totalizer in front elevation;

Fig. 9 shows in side elevation a ratchet mechanism of the subtracting totalizer;

Fig. 10 shows in side elevation a similar ratchet mechanism of the adding totalizer;

Fig. 11 shows in top plan view a modification of the structure shown in Fig. 1;

Fig. 12 is an elevation of the manual operator to set the apparatus for given monetary amounts;

Fig. 13 is a side elevation of an apparatus embodying the invention;

Fig. 14 is a vertical section across the structure shown in Fig. 13 with some of the parts thereof in the locking position assumed by them upon use of the monetary amount for which the apparatus has been pre-set by the postal authorities;

Fig. 15 shows in side elevation and in longitudinal section the printing cylinder used for making imprints of monetary amounts;

Fig. 16 is in substance a transverse section through the structure of Fig. 15 with some of the parts shown in elevation rather than in section;

Fig. 17 is an end view of the totalizer operating mechanism or control cylinder including a plurality of toothed wheels having pin-teeth adapted to be shifted at will from an inoperative to an operative position, and

Fig. 18 shows in part in elevation and in part in section a mechanism for locking and unlocking the printing cylinder of the device.

Referring now to the drawings, and more particularly to Figs. 14 to 16, reference numeral 81 has been applied to indicate a printing cylinder comprising a plurality of type wheels such as 92 and 99. When the printing cylinder 81 is rotating and its type wheels 92 and/or 99 pressed against a letter which is moving relative to the printing cylinder, an impression is made upon the letter in lieu of postage stamps. Printing cylinder 81 supports a shaft 91 on which the three type wheels 92 are mounted. Each of the three type wheels 92 can be set in any desired angular position to print any desired monetary amount involving three digits, or less. To adjust type wheels 92 suitable gear means are provided including gear wheels 93 and 94, and bevel wheels 95 and 96 meshing with gear wheels 93 and 94 and driven by gear wheels 97 mounted on shaft 98. Shaft 100 supports additional type wheels 99 each of which can be set in a number of different angular

positions to print any desired date. If desired, the cylindrical printing surface of printing cylinder **81** may also be provided with other type wheels—similar to wheels **99**—for printing advertising and like matter on envelopes, etc. However, these other type wheels have not been shown in the drawing. All the type wheels which are supported by, and arranged on the outer surface of printing cylinder **81** are supplied with ink from an ink well **83**, and inking of the type wheels is accomplished by an ink roller **84**. A structure similar to that shown in Figs. 14 to 16, inclusive, has been disclosed in the aforementioned United States Patent 2,187,456.

The desired adjustment of the type wheels **92** of printing roller **81** may be effected by three manually adjustable discs **77**, **78**, and **79** mounted on a common spindle **75** (see Fig. 13). Spindle **75** with its adjusting discs **77**, **78**, **79** is supported on rocking lever **76** (see Fig. 14) mounted on shaft **80**. Each adjusting discs **77**, **78**, **79** is provided with a gear (not shown) adapted to mesh with one of the gears **97** of printing cylinder **81**. When rocking lever **76** is in the position wherein the gear associated with adjusting discs **77**, **78**, **79** mesh with the gears **97**, a gear (not shown) for operating a plurality of coaxial cams **104** forming a control or operating cylinder **82** are also meshing. Each cam **104** (see Fig. 17) has a groove **104***a* and each groove controls a number of pins **105**, i. e. nine such pins. Each pin **105** is provided with a lug engaging groove **104***a*. Each pin of each set of nine pins **105** cooperating with, or controlled by, each cam **104** can be moved radially outwardly by rotating cam **104** in counterclockwise direction, as seen in Fig. 17. Radially outer movement of pins **105** is achieved by virtue of the geometrical configuration of cam groove **104***a* comprising two circular portions of different radii connected by a slanting portion. It will be seen that according to the angular position of cams **104**, a different number of pins **105** will lie in the radially outer portion of can groove **104***a* and project out of the cylinder **82** formed by the aforementioned plurality of cams **104**.

Fig. 17 shows a cam **104** in a position in which four pins **104** project beyond the cylindrical surface of a drum **82** accommodating cams **104** and guiding the radial portions of pins **105**. One of the pins **105** shown in Fig. 17 is sliding with the lug thereof on the slanting portion of groove **104***a*, thus being in the process of being moved radially outwardly. The remaining pins **105** are in their radially inner positions. The section of drum **82** which contains pins **105** is thus made a gear wheel sector having an adjustable number of gear teeth. The number of pin-teeth which project from drum **82** depends upon the setting of adjusting discs **77**, **78**, **79** shown in Fig. 13. Thus, disc **77** being set to the numeral zero causes one of the discs **104** to be set accordingly with no pin projecting from drum **82**; the adjusting cam **78** being set to numeral 2 causes one of the discs **104** of drum **82** to be set in such a way that two pins project from drum **82**; the adjusting disc **79** being set to numeral 1 causes the corresponding cam **104** in drum **82** to be moved in the position wherein one pin **105** projects from the surface of the drum. A gear on printing cylinder **81** meshes permanently with a gear on control drum **82**, thus causing the latter to always rotate simultaneously with the former.

The pin-teeth **105** of the above described control drum mechanism mesh with the number wheels of an adding totalizer A which is mounted upon shaft **34** (see Fig. 1). Adding totalizer A adds the monetary amounts of the imprints which have been made with the apparatus. A subtracting totalizer S mounted on shaft **42** is mechanically coupled with, and controlled by, the adding totalizer A and operates in reverse direction, so to speak. The subtracting totalizer S controls a latching lever **43** intended to lock the device to preclude further use thereof.

The subtracting totalizer S indicates the amount up to which impressions can still be made. In other words, it is a cash balance indicator. Before any postage impressions can be made the subtracting totalizer or cash balance indicator must be pre-set in accordance with the total amount of cash which may subsequently be used up by an aggregate of impressions. Such pre-setting may be effected by a knob **5** rendered accessible upon removal of lid **201**. (See Fig. 14). Knob **5** operates the pair of meshing bevel wheels **6** and **7** and also the spur wheels **16**, **17**, **26**, **30** and **31**. As clearly shown in Fig. 1, bevel wheel **7** and spur wheel or pinion **16** are mounted on spindle **15**, and spur wheels **17** and **26** are mounted on spindle **21**. Spur wheel **31** operates the number wheel of the subtracting totalizer S corresponding to the highest digit thereof. In addition to the subtracting totalizer or cash balance indicator S, knob **5** operates also another counting device to which the reference numeral 19 has been applied. Counting device **19** adds and indicates the sum total of all pre-payments, and is being set for the same amount of cash as the cash balance indicator S. In case that the cash balance is zero, the locking or latching device of the apparatus must become operative. Operation of the pre-setting knob **5** then effects unlocking or unlatching of the apparatus, and the apparatus then can again be used for making monetary imprints up to the sum total indicated by the subtracting totalizer, or cash balance indicator S.

The structure illustrated in Fig. 1 comprises a frame **3** supporting spindle **4** on which operating knob **5** is mounted. Both operating knob **5** and bevel wheel **6** are pinned to the spindle **4**. Both bevel wheel **7** in mesh with bevel wheel **6** and pinion **16** are pinned to spindle **15** supported by bracket **14** and frame **1**. Pinion **18** likewise pinned to spindle **15** operates the counting device **19** which—as mentioned before—indicates the sum total of all the amounts pre-set by means of knob **5**.

Preparatory to pre-setting the apparatus, lever **23** must be shifted to move a coupling element **25** mounted on spindle **21** from one of its positions to the other position thereof. Coupling element **25** is provided on its right side with a pair of pins **202** adapted to engage a pair of perforations **203** in pinion **17** (see Fig. 1). Pins **201'** of coupling element **25** are adapted to engage perforations provided in spur wheel **26**. By shifting the operating end of lever **23**, coupling element **25** may be shifted from its position shown in Figs. 1 and 11 to the right, thus causing engagement of the perforations **203** in spur wheel **17** by the pins **202** in coupling element **25**. The coupling or clutch lever **23** controls a spring **95** (see Fig. 12) which acts upon a balance lever **72** for an escapement wheel **71**. The latter is mounted on the spindle 4 supporting knob **5**. The balance lever **72** is pivotally mounted in frame structure **3** and normally engages the escapement wheel **71**, thus precluding rotation of spindle **4**. Upon shifting of the coupling or clutch lever **23** in such a way as to cause pins **202** to engage the perforations **203** in spur wheel **17**, lever **72** is shifted by spring **95** so as to permit rotation of escapement wheel **71**, spindle **4** and knob **5** in clockwise direction, as seen in Fig. 12. Rotation of knob **5** enables to pre-set the apparatus for any desired monetary amount. The subtracting totalizer or balance indicator S then indicates the sum total of the new amount for which the apparatus has been set plus any residual amount which may have been unused by impressions at the time the apparatus is being pre-set.

Referring again to Fig. 1 the rotary motion of knob **5** is transferred to spur wheel **17** engaged by the pins **202** of coupling element **25**. Transverse pin **24** provided in spindle **21** is slidably arranged in a slot of coupling element **25**, and therefore the rotary motion of spur wheel **17** is transmitted to the spindle **21**. Rotation of spindle **21** causes joint rotation of number dial **28**, cam **27** and spur wheel **26**, all mounted on spindle **21**. The numbers on number dial **28** can be read off through an opening or window **2***a* provided in the side wall of a housing or casing **2**. The number on the dial **28** indicates the amount

of the pre-payment made at the occasion of pre-setting the device, plus any residual amount which may happen to be unused at the time the device is being pre-set.

As best shown in Figs. 4 to 6, inclusive, cam **27** controls a latching or locking lever **43** which may drop into a groove **27***a* of cam **27** and thus prepare latching, or locking, of the entire apparatus.

Spur wheel **26** meshes with spur wheel **30** loosely mounted upon spindle **34** of the counter or adding totalizer A. Spur wheel **30** meshes in turn with spur wheel **31** of the counter or subtracting totalizer S. Spur wheel **31** is attached to the number wheel **64** corresponding to the highest digit of the subtracting totalizer, e. g. corresponding to hundreds of dollars. As can best be seen in Fig. 12, knob **5** can be rotated as much as nine steps. If knob **5** is rotated all possible nine steps, the lowest number wheel of the counter **19** is being rotated nine steps, which is equal to nine pre-setting units of which each corresponds to 100 currency units. Upon a nine step rotation of knob **5** spur wheel **64** of subtracting totalizer S is also rotated nine steps. Such a nine step rotation means that the device has been pre-set for nine pre-setting units each corresponding to 100 currency units, e. g. 900 dollars. Window or opening **101** in housing **2** enables to read the counter or meter **19** (see Fig. 14). The two terminal noughts of the amount are permanently marked on the outside of casing **2** adjacent window **101**, thus indicating that one pre-setting unit is equivalent to 100 currency units, e. g. 100 dollars.

The apparatus is locked or latched during the time the pre-setting knob **5** is being adjusted or manipulated. Locking or latching of the apparatus is effected by the rear end of lever **23** entering into a slot **26***a* of wheel **26** as indicated in Fig. 14. The apparatus is unlocked and rendered operative upon return of lever **23** to the original position thereof, i. e. upon shifting of lever **23** to the right as seen in Fig. 14. If lever **23** is so moved, spring **95** acting upon balance lever or latch **72** locks the escapement wheel **71** in the position precluding rotation thereof by knob **5** in clockwise direction, as seen in Fig. 12, thus making it impossible to pre-set the apparatus for another amount than that for which it has been previously pre-set. Effecting return of knob **5** to the initial position thereof by a counterclockwise rotation (as seen in Fig. 12) has no effect upon the counter **19**, the letter being connected to spindle **15** by a one way drive mechanism.

The type wheels **92** forming an integral part of the printing cylinder **81** (Figs. 14, 15 and 16) are being adjusted in accordance with the amount to be imprinted on a given piece of mail and the pin gears form an integral part of control drum **82** are being adjusted simultaneously with the type wheels **92**. The aforementioned pin gears are in mesh with the spur wheels **37**, **38** and **39** of the counter or adding totalizer A. The mechanism shown in Fig. 13 permits adjustment of three digits, i. e. units and two decimals. The pin wheel which corresponds to the lower decimal meshes with the wheel **39**. Wheel **39** and number wheel **55** form an integral unit fixedly coupled with gear **36**. Gear **36** meshes with gear **40**, fixedly coupled with the number wheel **60** of the counter or subtracting totalizer S. The number wheels **55** and **60** indicate the lowest decimal numbers, e. g. cents. Gear **36** is provided with a pair of projections or cams which operate gear **36***a* whenever number wheel **55** is moved from the 9 position to the 0 position thereof. Gear **36***a* meshes with a gear **65** fixedly coupled with ratchet wheel **69** (Figs. 1 and 10). Ratchet wheel **69** is engaged by the ratchet **70** of the number wheel **56** indicating the higher decimal digit. The number wheel **56** is also operated by the gear **38** which in turn is operated by one of the pin wheels of drum **82**. Gear **38** is fixedly coupled with gear **35** and with ratchet wheel **69***a*. The latter cooperates with the ratchet **70***a* of the number wheel **56**. The construction of ratchet wheel **69***a* and of ratchet **70***a* is the same as that of ratchet wheel **69** and of ratchet **70** shown in Fig. 10. Rotation of gear **38** causes rotation of gear **57** by means of ratchet **70***a*. Rotation of ratchet wheel **69** causes number wheel **56** to be advanced one step. Gear **35** transmits only such movements to the subtracting totalizer S which are transmitted from the control or operating drum **82** to gear **38**. The number wheel **61** of the subtracting totalizer **5** is adapted to be operated by a ratchet wheel **61***a*, fixedly coupled with gear **41** meshing with gear **35**, or by ratchet wheel **61***b* which is being moved one step forward at each complete rotation (each tenth step) of number wheel **60** (see Fig. 9).

The operation of the number wheel **57** of the adding totalizer A indicating units as, for instance dollars, and the operation of the number wheel **62** of the subtracting totalizer S indicating units is effected in the same manner as the aforedescribed operation of the number wheels indicating two decimal digits.

Reference numerals **58** and **59** have been applied to two number wheels of the adding totalizer A which are higher order wheels for indicating two additional digits. These number wheels are operated as in any prior art counter by appropriate mechanisms which move the respective number wheel one step any time the lower digit number wheel completes one entire revolution, i. e. moves from the 9 position to the 0 position.

Reference numeral **63** has been applied to the number wheel of the subtracting totalizer S indicating the ten digits. This number wheel is adapted to be operated only by virtue of its mechanical connection with the units number wheel of the subtracting totalizer S. The number wheel **64** of the subtracting totalizer S indicating the hundred digits is fixedly coupled with the gear **31** adapted to be operated by the pre-setting mechanism of the apparatus. To this end number wheel **64** is mounted upon a sleeve **50**, the outer surface of which has a number of ratchet teeth (Figs. 1, 2 and 3), and it supports pairs of leaf springs **48**, **48** and **49**, **49**, which permit rotation of number wheel **64** on, and relative to, sleeve **50**. Sleeve **50** is engaged by pin **51** providing a fixed coupling between said sleeve and gear **45**. The latter is operated any time number wheel **63** indicating the ten digits is moved from its position 9 to its 0 position.

The printing mechanism of the printing cylinder **81** enables to make imprints of which the highest is 9.99 units, e. g. $9.99. The respective amount is being added by means of number wheels **55** to **59** of the adding totalizer A, and subtracted by means of the number wheels **60** to **64** of the subtracting totalizer S. Adding totalizer A indicates the sum total of all imprints which have been made, and the subtracting totalizer indicates the total value of the impressions which still can be made. The figure indicated by the adding totalizer A plus the figure indicated by the subtracting totalizer S is the total of all pre-payments. The sum of all pre-payments is being indicated by counter **19**, and this enables to check in a simple manner whether the apparatus is in order and operates correctly. In other words, the sum of figure on counter A plus that on counter S must at any time be equal to the figure indicated on counter **19**.

Assuming that the device has been pre-set by knob **5** to a position of 7 pre-setting units, each corresponding to 100 units of value or currency, e. g. 100 dollars, then both the counter **19** and the subtracting totalizer S will indicate "700" before any monetary impressions have been made with the apparatus. Assuming now that a number of monetary impressions have been made totalling $67.46. Then the adding totalizer A indicates the amount of 67.46, the subtracting totalizer S indicates the amount of 700 minus 67.46 which is 632.54 and the counter **19** indicates 700 which is the sum of 67.46 plus 632.54.

The figure of 700 is equal to the total value of the monetary impressions which can be made with the ap-

paratus before a new pre-payment to the postal authorities and a corresponding pre-setting of the apparatus must be made.

In case that the total value of the monetary impressions which can still be made drops to 9.99—the highest amount involved in any single operation of the apparatus—or less, the apparatus must be locked to preclude continued operation thereof. This locking operation precludes the sum total of monetary impressions made from exceeding at any time the amount for which the apparatus has been pre-set. The locking mechanism of the apparatus has been illustrated in Figs. 4, 5 and 6 wherein reference numeral **43** has been applied to a locking lever shown in Fig. 4 in the locking position thereof. When locking lever **43** is in the locking position the left end thereof is engaged by an abutment **44***a* provided on a lever **44**. Lever **44** is being rocked at each revolution of control cylinder **82** by a pin **85** projecting therefrom (see Fig. 14). When rocked, lever **44** engages a lever **74** mounted upon shaft **106**. Shaft **106** forms an integral part of a push button **107**, as clearly shown in Fig. 18. Disc **108** mounted on shaft **106** is coupled by means of pin **108***a* with lever **74**. When push button **107** is being actuated, i. e. moved from left to right, as seen in Fig. 18, disc **108** is moved to the right and causes lever **109** to pivot in clockwise direction on pivot **109***a*. Lever **109** is acted upon by a spring (not shown) tending to move the lower or free end thereof into a groove or recess **110** of printing cylinder **81**. This occurs at the end of each complete revolution of printing cylinder **81**. Lever **109** must be caused to move to its locking position after completion of each revolution of printing cylinder **81**, irrespective of the position of push button **107** at this time. To enable free movement of lever **109** to its locking position at the end of each complete revolution of printing cylinder **81**, disc **108** is acted upon by lever **44** and shifted out of the path of lever **109** shortly prior to completion of each revolution of cylinder **81**. This releases lever **109** even if push button **107** should still be depressed at this time. As long as lever **44** and lever **74** are shifted by pin **85** out of their normal positions lever **109** cannot be moved out of its locking position within groove **110** of printing cylinder **81** by depressing push button **107**. When the locking mechanism is in its locking position shown in Fig. 4, lever **44** is also locked by the mechanism.

The position of lever **43** is dependent upon the position of cams **27** and **53**. Cam **27** is mounted on the shaft **21** of the pre-setting mechanism which shaft is permanently coupled with the hundred units number wheel **64** of the subtracting totalizer S by means of gear train **26**, **30** and **31**. Cam **53** is attached to the ten units number wheel **63** of subtracting totalizer S. Cam **27** supports locking lever **43** so long as the hundred digit number wheel **64** indicates a figure which is larger than zero, thus precluding the locking lever **43** from moving to the locking position thereof. This is shown in Fig. 5. Upon rotation of the hundred digit number wheel **64** to the position wherein it indicates zero, the recess or groove **27***a* in cam **27** is in registry with the locking element **43***a* at the right end of locking lever **43** (Fig. 6), but arm **52** of locking lever **43** is still supported on the periphery of the cam **53**. If now the number wheel **63** is further moved until it reaches the zero indicating position thereof, the wedge shaped end of arm **52** of locking lever **43** comes to be in registry with notch **53***a* provided in cam **53**. Hence locking lever **43** can be moved to the locking position shown in Fig. 4 under the action of an actuating spring (not shown).

The above described mechanisms operate as follows:

Assuming that the pre-set amount has been used up to a point where the balance or remainder thereof is less than $9.99. This causes locking lever **43** to assume the locking position thereof. Lever **44** and lever **74** are then arrested by lever **43**, and therefore latching lever **109** cannot be lifted out of its latching position in groove **110** of cylinder **81** by operation of push button **107**. The device can only be rendered operative if again pre-set by an authorized person. To this end the protective hood or cover **201** is being removed, which gives access to lever **23**. Lever **23** is then shifted to the left as seen in Figs. 1, 11 and 12. Thereupon arm **11** is turned by means of its handle **13** to the figure indicating the amount for which it is intended to pre-set the device. The next step is to turn operating knob **5** until arm **12** abuts against handle **13**. Assuming arm **11** had been turned to the figure 7, as indicated in Fig. 12; under such circumstances operation of knob **5** causes the unit number wheel of the counter **19** to move seven steps, thus assuming the position illustrated in Figs. 1 and 11. Operation of knob **5** causes the number wheel **64** of the subtracting totalizer to move seven steps, each corresponding to one unit, and cam **27** is rotated in an angle which is proportional to seven steps. Cam **27** therefore lifts the end **43***a* of lever **43** out of recess **27***a*, thus releasing lever **44**. Spring **106***a* mounted on shaft **106** shifts member **74** to the vertical position thereof wherein push button **107** is being coupled by it with latch **109**.

In order to select the value of the impression to be made on a letter or other mail lever **76** is pivoted about shaft **80** (see Figs. 13 and 14), whereby the gears associated with the selector discs **77** to **79** are caused to engage the gears **97** (Figs. 15 and 16) of the printing cylinder **81** and the corresponding gears of the control drum **82**. Reference numeral **75***a* has been applied to indicate gears associated with selector discs **77** to **79**. The support of shaft **80**, the handle on lever **76** for operating lever **76** have not, and the gears associated with the selector discs **77–79** have not fully, been shown in Fig. 14, this structure being fully disclosed in the above referred-to United States Patent 2,187,456 (see particularly Fig. 29 thereof). Subsequent adjustment of the three selector discs **77** to **79** causes the type wheels **92** of the printing cylinder **81** as well as the pin wheels **104** of the control drum **82** to move to the respective positions required for making the desired impression. Thereafter arm **76** and selector discs **77–79** are shifted back to their original position wherein the gear associated with the selector discs **77**, **78**, **79** are no longer in cooperative relation with type wheels **92** and pin wheels **104**. Actuation of push button **107** then causes latching lever **109** to release printing cylinder **81**. Printing cylinder **81** may now be rotated 360° to make the desired impression. To this end the entire device is placed upon the letter or other mail to be imprinted and moved across the surface thereof. Upon having completed approximately one entire revolution, pin **85** of control drum **82** engages member **44** and the latter shifts lever **74** and disc **108** to release latch **109**, which then drops again into the latching groove **110** of cylinder **81**. In order to be able to make the next impression push button **107** must again be actuated to again release cylinder **81**.

As any monetary impression is being made, the pin wheels **104** of drum **82** act upon the number wheels of the adding totalizer A by the intermediary of gears **37**, **38** and **39**. Since the subtracting totalizer S is geared to the adding totalizer A, the pin wheels **104** of drum **82** control also subtracting totalizer S at any impression made. The number wheel **64** of the highest digit of the subtracting totalizer S is being operated by the intermediate gear **31**, **30**, **26** until cam **27** has reached the locking position thereof. The locking lever **43** cannot engage the recess **27***a* in cam **27** before cam **53** connected to the next lower digit number wheel **63** has reached its respective locking position. Cam **53** reaches its respective locking position when the pre-set amount has been used up, except for a balance of $9.99, or less. If this is the case, locking lever **43** drops into recess **27***a* of cam **27** and locks the element **44**, thus precluding further removal of latch **109** from recess **110** in cylinder **81** by actuation of push-button **107**.

The mechanism shown in Fig. 11 differs from that shown in Fig. 1 in that the subtracting totalizer S is only provided with number wheels for unit digit numbers, ten digit numbers and hundred digit numbers, the number wheels for indicating decimal digit numbers having been

omitted. Only the decimal digit number wheels **55** and **56** of the adding totalizer are adjustable by means of the gear in the operating drum **82** by the intermediary of gear **38** and **39**. Only number wheel **57** of the adding totalizer A indicating unit digit numbers is provided with a gear engaging a gear of a number wheel of the subtracting totalizer S, i. e. number wheel **57** is provided with gear **32** meshing with gear **33** of the number wheel **61** of the subtracting totalizer S indicating unit digit numbers. Number wheel **57** may be fixedly attached to gear **32**—as distinguished from the structure of Fig. 1—since any stepping operation of the number wheel **57** of the adding totalizer A is being transmitted to the number wheel **62** of the subtracting totalizer S indicating the lowest digit. Omission of the number wheels in the subtracting totalizer indicating decimal digits makes it possible to simplify substantially the transmission between the number wheels of the adding totalizer A indicating decimal digits. Number wheels **63** and **64** of the subtracting totalizer S shown in Fig. 11 are the same as the number wheels in Fig. 1 indicated by the same reference numerals, and the locking lever **43** diagrammatically indicated in Fig. 11 is controlled in the fashion illustrated in Figs. 4 to 6, and described in the context thereof.

While the embodiments of the invention disclosed above are provided with means for making impressions involving three digits, it will be apparent to anyone skilled in the art that the structures shown could readily be modified, if desired, for making impressions involving more than three digits, e. g. four digits. If the apparatus shown in Fig. 11 were to be modified to enable making impressions involving four digit numbers, a transmission or gear train ought to be provided between the number wheel of the subtracting totalizer S indicating the lowest digit and the number wheel of the adding totalizer A indicating the fourth digit.

It will be understood that, although but two embodiments of the invention have been described in detail, the invention is not limited thereto, and that the illustrated embodiments may be modified, or other embodiments made, without departing from the spirit and scope of the invention as set forth in the accompanying claims.

It is claimed:

1. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions, common means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with pre-determined amounts to be printed by said printing cylinder, an adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the sum total of said predetermined amounts, a subtracting totalizer deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a locking mechanism under the control of said subtracting totalizer for precluding continued rotation of said printing cylinder, a manual operator, a coupling adapted to be shifted selectively into two different operating positions for connecting said manual operator operatively with said subtracting totalizer to enable manual adjustment by said manual operator of said subtracting totalizer to said predetermined value, and an additional counter under the control of said manual operator adding the sum total of each said predetermined value to which said subtracting totalizer has been pre-set.

2. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, common means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, an adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the sum total of said predetermined amount, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a locking mechanism under the control of said subtracting totalizer for precluding continued operation of the printing apparatus, a manual operator, a coupling adapted to be shifted selectively into two different operating positions enabling to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof, and an additional counter under the control of said manual operator adding the sum total of each said predetermined value to which said subtracting totalizer has been pre-set.

3. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in acocrdance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a locking mechanism under the control of said subtracting totalizer for precluding continued operation of the printing apparatus, a manual operator, a coupling adapted to be shifted selectively to two different operating positions enabling to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, and means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined

value to which said subtracting totalizer is being pre-set by said manual operator.

4. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a locking mechanism under the control of a plurality of number wheels of said subtracting totalizer for precluding continued operation of said apparatus, a manual operator, a coupling adapted to be shifted selectively to two different operating positions enabling to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, and means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator.

5. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating a number involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a manual operator, a coupling adapted to be shifted selectively into two different operating positions enabling to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator, a cam, a gear train in permanent engagement fixedly coupling said cam with the number wheel of said subtracting totalizer indicating the highest digit, and a locking lever controlled by said cam adapted to lock-out said printing apparatus upon rotation of said number wheel of said subtracting totalizer to the zero position thereof.

6. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a manual operator, a coupling adapted to be shifted selectively into two different operating positions enabling to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator, a first cam driven by a train of permanently engaged gears from the number wheel of said subtracting totalizer indicating the highest digit, a second cam driven by another number wheel of said subtracting totalizer, and a locking lever controlled by said first cam and by said second cam for locking-out said printing apparatus upon rotation of said number wheel of said subtracting totalizer indicating the highest digit and upon rotation of said other number wheel of said subtracting totalizer to the respective zero position thereof.

7. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative and operative positions thereof, means for adjusting said plurality of type wheels and

said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, means controlled by one of the number wheels of said subtracting totalizer operative upon stepping of said one of the number wheels from the zero position to the nine position thereof to advance one step the number wheel of said substracting totalizer indicating the next higher digit, a lock-out mechanism under the control of said subtracting totalizer precluding continued operation of said apparatus, a manual operator, an adjustable coupling adapted to be shifted to two different operating positions to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, and means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator.

8. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregrate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, a manual operator, an adjustable couplng adapted to be shifted to two different operating positions to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a pair of toothed wheels associated with said number wheel of said subtracting totalizer indicating the highest digit thereof, one of said pair of toothed wheels being under the control of the number wheel of said subtracting totalizer indicating the next lower digit and the other of said pair of toothed wheels being under the control of said manual operator, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, and means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator.

9. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with a plurality of adjustable type wheels, a rotatable control cylinder provided with a plurality of toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said plurality of type wheels and said plurality of teeth of said plurality of toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said plurality of toothed wheels upon rotation of said control cylinder to indicate the aggregate of said predetermined amounts, a subtracting totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, a manual operator, an adjustable coupling adapted to be shifted to two different operating positions to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels for indicating numbers involving a plurality of digits, means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator, means under the control of said plurality of toothed wheels controlling said plurality of number wheels of said subtracting totalizer for deducting each said predetermined amounts from a predetermined value to which said subtracting totalizer has been pre-set, a pair of toothed wheels associated with the number wheel of said subtracting totalizer indicating the highest digit thereof, one of said pair of toothed wheels being under the control of the number wheel of said subtracting totalizer indicating the next lower digit and the other of said pair of toothed wheels being under the control of said manual operator, and coupling means permitting rotation of said number wheel indicating the highest digit in opposite directions depending upon whether said number wheel indicating said highest digit is being operated by said number wheel indicating the next lower digit or by said manual operator.

10. In an apparatus for printing monetary amounts comprising setting means for pre-setting the apparatus for the printing of a plurality of monetary amounts representing a predetermined aggregate value and locking means for precluding continued printing when the aggregate value of the printed amounts reaches said predetermined aggregate value the combination of a rotatable printing cylinder provided with three adjustable type wheels, a rotatable control cylinder provided with three toothed wheels each having a plurality of teeth adapted to be individually adjusted between inoperative positions and operative positions thereof, means for adjusting said three type wheels and said plurality of teeth of said three toothed wheels in accordance with predetermined amounts to be printed by said printing cylinder, a first adding totalizer adapted to be operated by said three toothed wheels to indicate the aggregate of said predetermined amounts including means under the control of said three toothed wheels in operative relation with the number wheels of said first adding totalizer, a subtracting totalizer compris-

ing a plurality of number wheels for indicating numbers involving a plurality of digits, means for coupling the number wheel of the third digit of said first adding totalizer with the number wheel of said subtracting totalizer indicating the lowest digit, a locking mechanism under the control of said subtracting totalizer for precluding continued operation of said printing apparatus, a manual operator, an adjustable coupling adapted to be shifted to two different operating positions to couple said manual operator with the number wheel of said subtracting totalizer indicating the highest digit thereof to pre-set said subtracting totalizer to predetermined values, a second adding totalizer comprising a plurality of number wheels

for indicating numbers involving a plurality of digits, means for establishing an operative connection between said manual operator and the number wheel of said second adding totalizer indicating the lowest digit to cause said second adding totalizer to add the sum total of each said predetermined value to which said subtracting totalizer is being pre-set by said manual operator.

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