Jan. 4, 1938. A. A. ROYCE ET AL 2,104,624

POSTAGE METER MACHINE

Filed Jan. 15, 1936 4 Sheets-Sheet 1

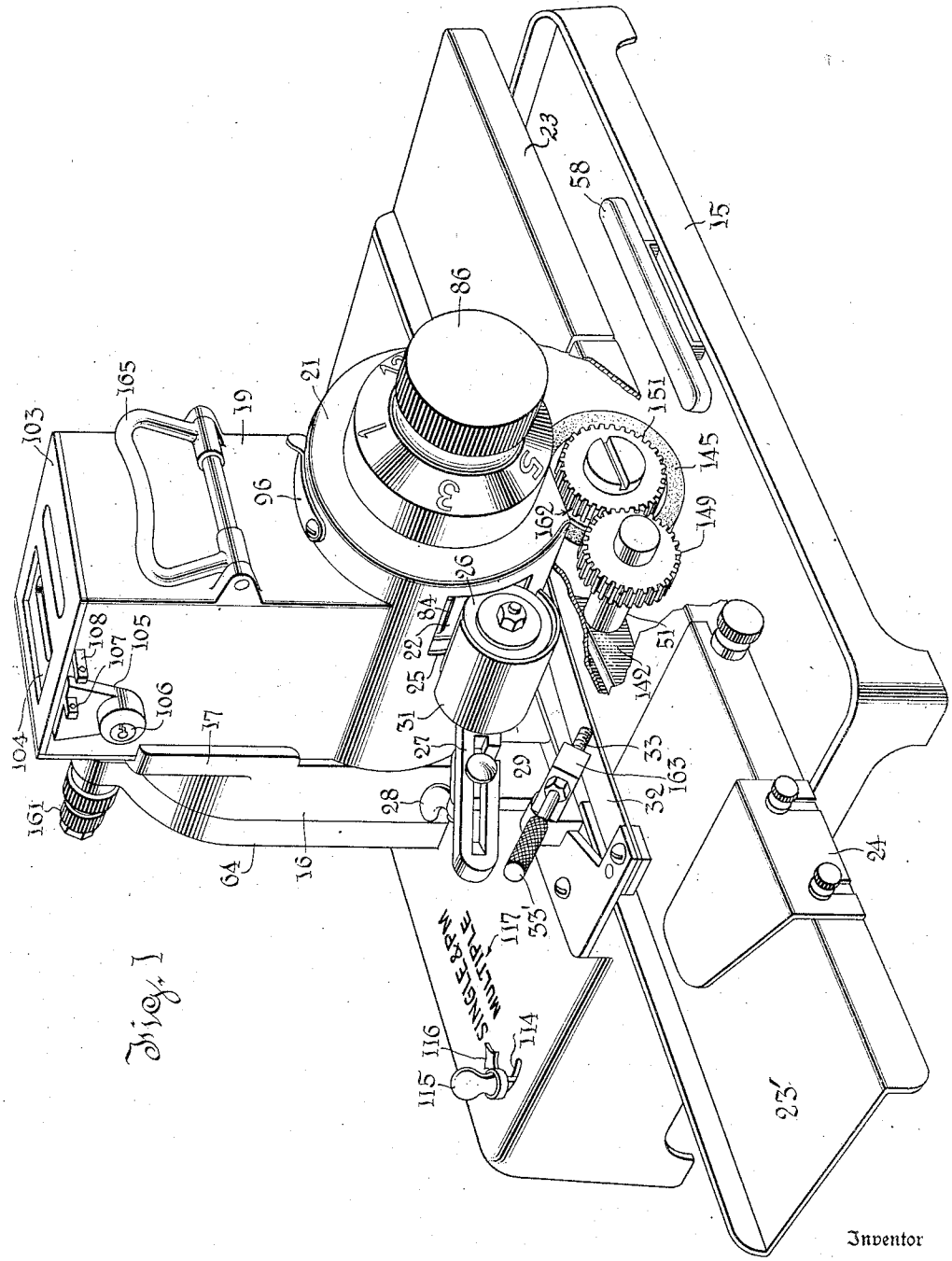


Fig. 1

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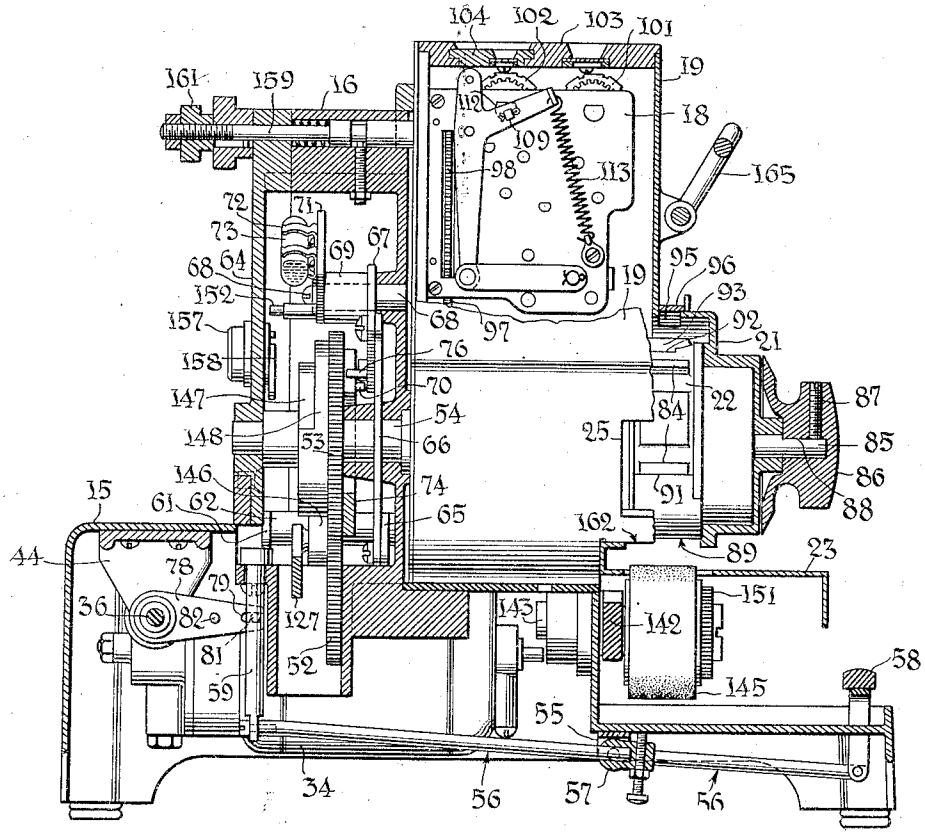
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POSTAGE METER MACHINE

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Fig. 2



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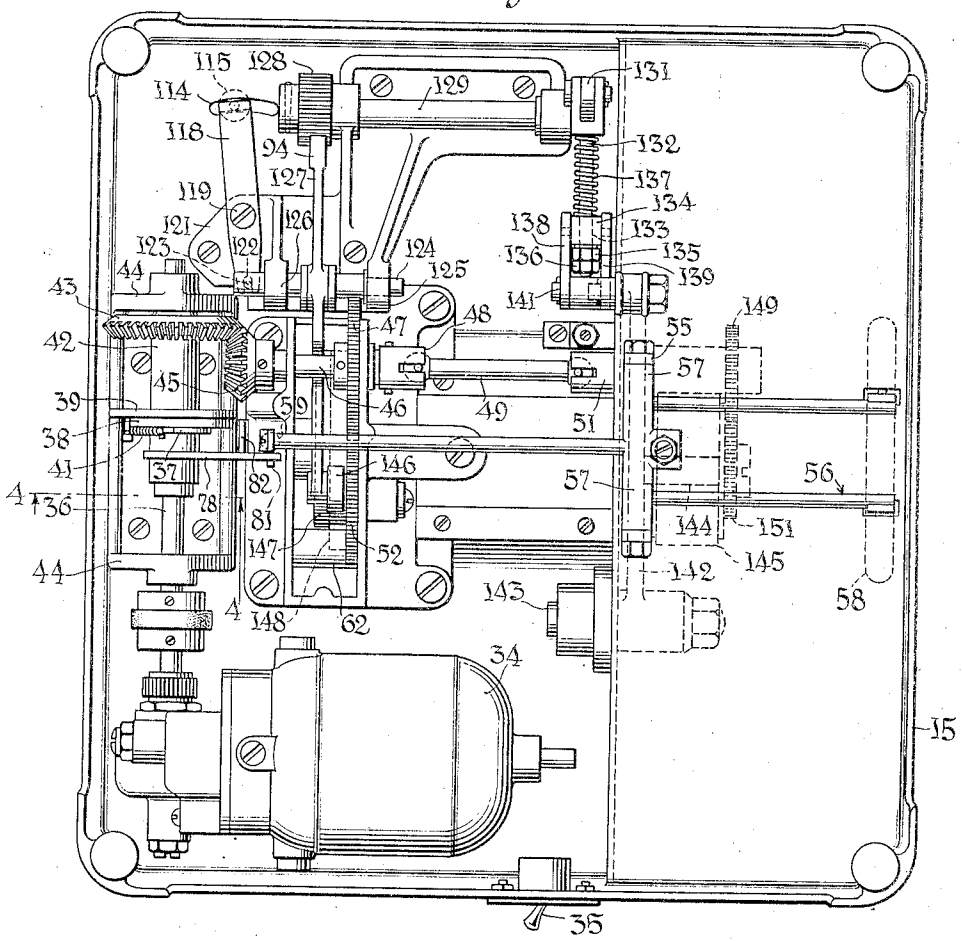
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POSTAGE METER MACHINE

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Fig. 3



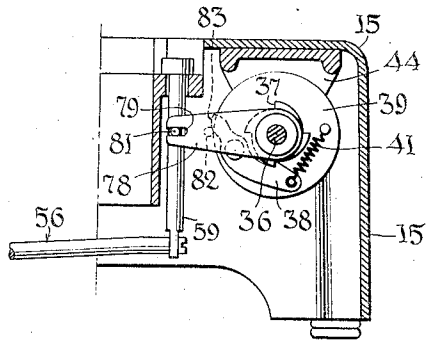


Fig. 4

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POSTAGE METER MACHINE

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Fig. 5

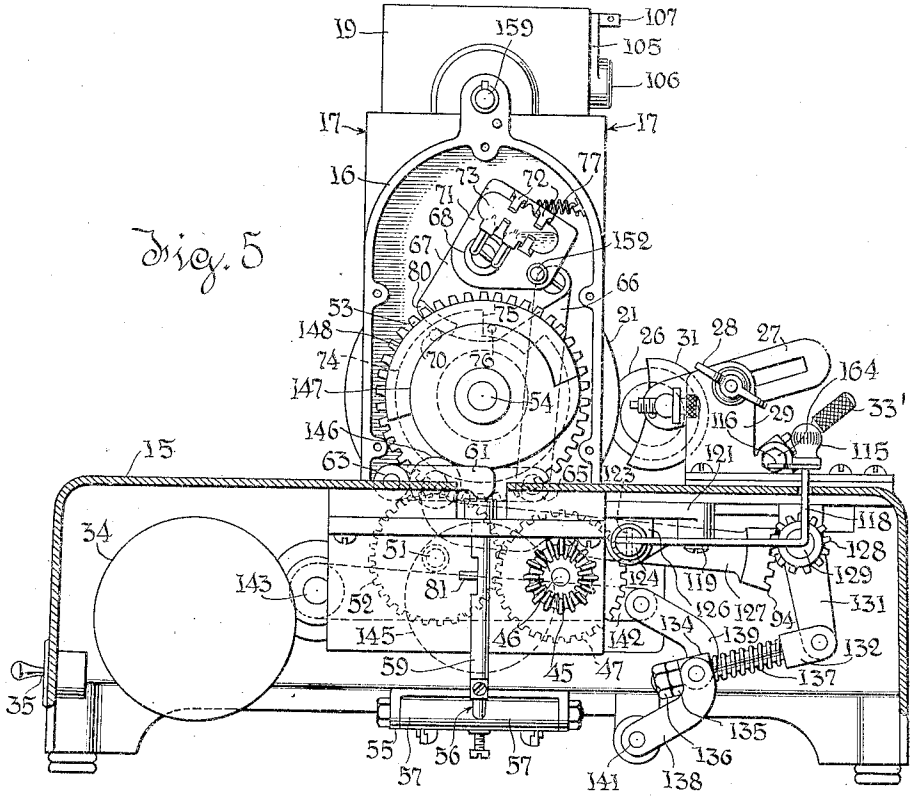
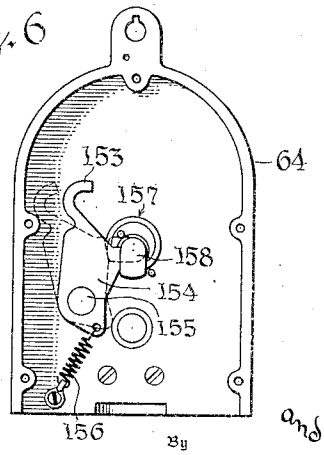


Fig. 6



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UNITED STATES PATENT OFFICE

2,104,624

POSTAGE METER MACHINE

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Application January 15, 1936, Serial No. 59,298

11 Claims. (Cl. 101—91)

This invention relates to postage printing and metering machines, and more particularly to that type of postage printer known as the "Multi-Denominational" machine, in which several dies, representing different denominations, may be selectively positioned to impress postage indicia on envelopes, cards, or other mail matter.

In general, the machine is that type which includes a metering mechanism for indicating and registering the amount of postage paid for and used by the machine; locking devices designed to prevent operation of the machine when a predetermined amount of postage has been printed on mail matter; and means for operating the several mechanisms.

The users of these machines purchase a desired amount of postage from a representative of the Government, who sets the metering mechanism. When the counter wheels of the meter have made a predetermined number of revolutions, the machine is automatically locked against further use and can be made operable only after the meter has again been adjusted by prepayment for additional postage.

Specifically, the present invention relates to means for timing the engagement of the impression roll with the mail matter as it is stamped and for regulating the pressure of the roll on the mail matter. The invention further includes novel means for shifting the timing means from a single impression of a stamp with the ring die to one in which the ring die is omitted and vice versa.

The machine and its operation will be more fully understood from the following description thereof taken in connection with the accompanying drawings, in which:—

Fig. 1 is a perspective view of the assembled machine, a portion thereof being broken away to illustrate the impression roll;

Fig. 2 is an elevation, partly in section, showing the relative positions of the several parts of the machine;

Fig. 3 is a bottom view of the machine, showing the drive therefor;

Fig. 4 is a partial section taken on line 4—4 of Fig. 3;

Fig. 5 is a back view of the machine, a portion of the base thereof being broken away to illustrate the drive and gearing, and the back plate of the switch housing being removed; and

Fig. 6 is an elevation of means for locking the machine when not in use.

Referring to the drawings, the machine comprises a base 15 having an upwardly extending gear housing 16, preferably cast with the base and having flanges 17 designed to form a partial support for the meter housing 18 thereon. The meter housing 19 has formed therewith a substantially cylindrical extension 21 providing a housing for the printing die 22.

Mounted on base 15 and lying in a plane below the printing die is a feed table 23 to which is fastened a removable plate 23' carrying a well for water. A removable tongue 24 carries a depending moistening device (not shown) whereby, as the mail matter is fed through the machine, it is automatically sealed, in addition to having postage indicia printed thereon.

An opening 25 permits inking roll 26 to be pressed against the die, as the latter rotates, and to ink the surface thereof before the indicia is printed on the mail matter. Ink roll 26 is pivoted on a slotted arm 27 which may be adjusted with respect to the die by means of a bolt and thumb nut 28 passing through a bracket 29. Guard 31 surrounds a substantial portion of the ink roll. A strip of spring metal 32, the tension of which may be adjusted by a threaded tension piece 33, holds the mail matter against the table in its passage through the machine and, supplementing the pressure of the impression roll, furnishes additional pressure to seal the envelopes which have previously been moistened by the moistening device. Further reference will be made to this spring hereinafter.

While the machine is adapted to be driven by hand, in the present form of the invention an electric drive is illustrated. Motor 34, initially controlled by switch 35, drives shaft 36 through suitable gearing. A ratchet member 37 on shaft 36 is adapted to be engaged by pawl 38 pivoted to plate 39. Spring 41 tends normally to force the pawl into engaging relation with the ratchet teeth.

Plate 39 is fastened to or is formed with sleeve 42 to which is also fastened bevel gear 43. Shaft 36 is journaled in a bracket 44 secured to the base of the machine. Meshing with bevel gear 43 is a second bevel gear 45 secured to shaft 46 to which is also fastened gear 47. A slotted sleeve 48 is secured to shaft 46, the sleeve forming one end of a universal joint comprising rod 49 and a slotted sleeve 51, the latter driving an impression roll, to be described hereinafter. Gear 47 meshes with pinion 52, and the latter, in turn, meshes with a gear 53 fixed on shaft 54.

Pivoted to bracket 55, which is secured to the base of the machine, is a lever 56 having fulcrum arms 57 thereon and having at its forward end

a finger key or bar 58. The rear end of the lever is pivotally connected to lift rod 59, the upper end of which bears against a rockable arm 61. Arm 61 is fastened to sleeve 62 pivoted on shaft 63, the latter being suitably supported in gear housing 16 and back plate 64 of the housing.

Formed on the opposite end of sleeve 62 is an arm 65 to which is pivoted a link 66 having a pivotal connection with a plate 67 rockable on stud 68. Connected to plate 67 by means of sleeve 69 is a second plate 71 having spring clips 72 thereon for supporting a mercury switch 73. This switch is in series with switch 35, and, assuming the latter switch to be closed, is adapted to control the motor through suitable wired connections (not shown), so that, when the plate is tilted in one direction, it will start the motor, and, when tilted in the opposite direction, will break the connections thereto to stop the motor.

On the back of gear 53 there is formed or secured thereto a cam piece 74 having a depression 75 therein. Pin 76 on plate 67 is adapted to fall into depression 75 when the switch is tilted to the position shown in Fig. 5, which is the normal cut-out position of the switch. When finger bar 58 is momentarily depressed, plate 67 is tilted through lift rod 59, arms 61, 65 and link 66 to throw the switch into circuit-closing position. At the same time, pin 76 is elevated to a position wherein it will ride on the periphery of cam piece 74. The switch is, therefore, held in circuit-closing position until gear 53 has made a substantially complete revolution, when pin 76 drops into depression 75, positively tilting the switch to its circuit-breaking position, being aided by contraction of spring 77 attached thereto. Pin 78 on cam piece 74 engages a projection 80 on plate 67 at this time and prevents further revolution of gear 53. At the same time, the motor is stopped. It will be seen that, when plate 67 is again tilted, pin 78 clears projection 80 and permits rotation of the cam.

When spring 77 tilts the plates 67 and 71, link 66, arms 61, 65, and lift rod 59 will be forced downwardly. Referring to Fig. 2, it will be seen that there is loosely mounted on shaft 36 an arm 78 having a slot 79 at its end engaging a pin 81 on lift rod 59. Arm 78 carries a pin 82 which, when finger key 58 is released, engages the projecting end 83 of pawl 38 and holds the pawl out of engagement with ratchet 37. When the finger bar is depressed and lift rod 59 elevated, pin 82 rides over the projecting end of the pawl to release the same and permit spring 41 to pull the pawl into engaging position with the ratchet. Since the elevation of the lift rod closes switch 73, thereby starting the motor, it is apparent that pawl 38 and ratchet 37 act as a clutch to rotate bevel gear 43 and start the gear train into operation.

As soon as pin 76 drops into depression 75, however, the lift rod will drop to a position in which pin 82 lies in the path of the projecting end 83 of pawl 38 and releases the pawl from the ratchet teeth, assuming the finger bar has also been released. This occurs after the gear 53 has made one revolution, and, even though the motor may overrun, it is apparent that the clutch is not operable to form a connection between the motor and the gearing.

As stated hereinbefore, housing 19 encloses metering mechanism indicated generally at 18 and the die 22 bearing postage printing members. It is to be understood that the housing 19, together with the meter and printing die, are removable from the machine, and when it is desired to attach the same thereto, the housing is slid down vertically between flanges 17 on housing 16, a suitable shaft and drive connection being provided between shaft 54 and the printing die shaft. It is now apparent that, upon rotation of gearing 43, 45, 47, 52 and 53, the die members will be rotated. The die itself comprises a cylindrical member 22 having a number of projecting faces 84 on its periphery and mounted eccentrically with respect to its carrier. Suitable mechanism, forming no part of the present invention, is provided to operate the postage registering mechanism used in accordance with the die setting.

The die may be changed to present the particular denomination desired by means of a shaft 85 having a knob 86 detachably secured thereto by means of a set screw or other suitable securing means 87. The end of shaft 85 is provided with a flat portion 88 to insure rotation thereof when the knob is turned. Shaft 85 can be rotated only when it is slightly withdrawn, the reason for this being that the inner end of shaft 85 is reduced and enters holes in the end of die carrier 89. When the end of the shaft is in engagement with these holes, it holds the die in set position.

The dies 84 project through an opening 91 in the die carrier. Spaced from opening 91 is a second opening 92 through which a "ring" die 93 projects. This die is held in position by screws or other sutable means, but is removable if it is desired to change the ring die. It is to be understood that the ring die is one which makes a circular impression on the mail matter and usually bears the post office designation and date thereon. The date die comprises the customary rotatable printing wheels, and access thereto may be had through opening 95 having a cover plate 96 pivoted to housing 21.

The die carrier is suitably geared to the counting mechanism through gears 97, 98, geared respectively to counting mechanisms 101 and 102. The former of these counting mechanisms is of the ascending type, while the latter is of the descending type. Counting mechanism 101 indicates the total postage used over a period, while the counters 102 are adapted to be set for a prepaid amount of postage, and, as the postage is used, the number indicated decreases. These counting mechanisms will not be described in detail, because they are of the usual type employed in registers.

Visual indications of the total postage consumed and that remaining to be used may be obtained through transparent pieces in the top plate 103 of the meter housing and a slidable plate 104, respectively. Plate 104 is provided with a depending flange 105 having a lock 106 thereon by which the same may be locked to the side of meter housing 19. This lock can be opened only by a properly authorized representative of the Government, who withdraws the plate 104 to obtain access to the descending counting wheels and resets them in accordance with the amount of postage paid for. Lugs 107, 108 are provided with perforations through which wire is passed and a lead seal attached by the postmaster to prevent fraudulent unlocking of plate 104.

Associated with the descending counting wheels is a lock mechanism similar to that shown in the patent to Mitchell and Zahn, No. 1,659,213, dated February 14, 1928, and comprising a bar 109 extending through the meter frame and through a slot in shaft 112. In each of several

of the counting wheels, in the present instance in three wheels, there is provided a radial slot on the inner periphery of the wheel. These slots are so positioned that, when the zero figure on each of the wheels is in alignment with the observation window, the slots will be disposed immediately beneath bar 109. Spring 113 normally tends to pull the bar into the slots and will do so when the wheels move to indicate that postage amounting to less than one dollar ($1.00) remains to be used, thus locking the machine against further use.

In some instances it is desirable to make more than one impression of a denomination on a piece of mailing matter. In order that these several impressions be made with but a single impression of the ring die or post office designation, the means now to be described are provided.

Projecting through a segmental slot 114 in the frame 15 is a knob 115 having an indicator 116 thereon. As will be noted in Fig. 1, there is indicated on the face of the frame at 117 the position in which the knob should be when it is desired to make a single postage imprint and the ring impression, as well as the position the knob should occupy when it is desired to print postage without the ring die impression. Knob 115 is fastened to a lever 118 pivoted at 119 to bracket 121, the latter being secured on the under side of frame 15. The opposite end of the lever is formed with a slot 122 which cooperates with pin 123 fastened to shaft 124 and mounted for reciprocation in guides 125, 126 on bracket 121.

Fixed to shaft 124 is a lever 127 having a segmental rack 94 at one end thereof meshing with pinion 128 fastened to shaft 129. To the other end of shaft 129 there is secured an arm 131 to which is pivotally connected a link 132. This link passes through bore 133 in block 134, the end of the link being threaded to receive nuts 135, 136. Surrounding the link is a relatively strong spring 137, the compression of which may be adjusted by turning nuts 135, 136. Pivoted to block 134 are a pair of toggle links 138, 139. Movement of arm 131 is transmitted through the spring to straighten the toggle, but, after the toggle is straightened as much as is necessary, link 132 can move further due to the lost motion connection with the toggle. Link 138 is pivoted at 141 to a depending portion of the frame, while link 139 is pivotally connected to arm 142 mounted for oscillation on shaft 143. Arm 142 carries sleeve 51 and shaft 144, on which impression roll 145 of rubber or other friction material is mounted. Lever 127 carries at one end thereof a roller or cam follower 146 adapted to follow either cam 147 or cam 148, depending on the position of lever 127 as determined by the position of knob 115. In other words, as shown in Figs. 1 and 3, shaft 124 and lever 127 are moved to the extreme right position (Fig. 3) so that roller 146 cooperates with cam 148. As will be seen in Fig. 5, the high surface of this cam is considerably longer than that of cam 147 and will depress the roller 146 for a relatively longer period. When the cam follower is depressed, the segmental rack 94 on the opposite end of the lever will rotate pinion 128 and move arm 131 to the left in Fig. 5, whereupon arm 142 will be elevated, raising impression roll 145 to hold mail matter against the die sufficiently long to cause not only the postage value but the ring die as well to be impressed on the matter.

On the other hand, when knob 115 is moved to the position designated in Fig. 1 as "Multi", the cam follower is moved to the left in Fig. 3 to cooperate with cam 147. This cam will elevate impression roll 145 for a period long enough to print the postage value only, the roll being dropped before the ring die has come to the position in which it would print the post office designation on the mail matter. It is to be noted that sleeve 51 carries a pinion 149 meshing with pinion 151, the latter being secured to roll 145.

The impressions made by the dies on mail matter must be very clear. If the impression roller exerts too little pressure on the under side of the envelope, the printed stamp will be light, while too great a pressure results in a smudged impression. The adjustable connection between link 132 and the toggle 138, 139, wherein the compression of spring 137 determines to a fine degree the clearness of the impression, permits printing of the character desired by the Government. At the same time, the lost motion connection between the link and toggle enables the impression roller to adjust itself to varying thicknesses of the mail matter passing the printing dies.

Since careless or unauthorized operation of the machine may occur when the attendant is not present, means are provided for locking switch plate 71 so as to prevent tilting of the mercury switch. These means comprise a pin 152 on the switch plate adapted to be engaged by a hook 153 on lever 154 pivoted at 155 on the back plate 64 of the gear housing. Spring 156 tends to hold the lever in a position wherein the hook engages pin 152. The hook is released by inserting a key in lock 157 in the back of the gear housing and turning a cam piece 158, the latter engaging lever 154 to move said lever to the dotted line position indicated in Fig. 6. Thus the operation of the machine may be controlled by a key in lock 157 in the back of the gear housing, so that, by turning the key, plate 71 may be locked or released for oscillation. Usually the operator will remove the key from the machine when not in use, the hook then engaging the tiltable switch plate. Incidentally, due to the connections of the switch plate with finger bar 58, the bar is also prevented from being depressed.

After the counting wheels have been set by the postmaster or other authorized government official, the meter is attached to the machine and operating mechanism by sliding the back plate downwardly to connect the gearing with the die carrier and registering mechanism. Bolt 159, having a key head insertible in a suitable opening in the meter housing, is then drawn taut by tightening nut 161. Switch 35 is then closed and, after knob 86 has been turned to bring the desired postage die to operating position, the machine may be operated by pressing finger bar 58 to tilt mercury switch 73 to closed position. When bar 58 is depressed, pawl 33 and ratchet 37 engage to rotate gears 43, 45, etc., whereby impression roll 145 presses the mail matter against the rotating die 23 corresponding to the value for which the knob is set.

As the die cylinder rotates, the meter registers postage corresponding with value at which knob 86 is set. The descending counting mechanism will continue to register until bar 109 is permitted

to drop into the aligned slots in the counter wheels, whereupon further rotation of the printing die is prevented. As previously explained, the machine may be set either to print postage with the post office designation, or a combined mark comprising the postage and post mark. In one instance, feed roll 145 holds the mail matter against the opening 162 on the under side of housing 21 only long enough to permit the postage to be printed on the mail matter. In the other position of the knob 115, the roll holds the mail matter against the die cylnider for a longer period, so that not only the postage but the post mark as well is printed on the mail matter.

When knob 115 is set to the position in which a single stamp impression and post mark is made, the impression roll and printing member will carry an envelope through the machine at a fairly rapid rate. Ordinarily, the envelope will be thrown forward sufficiently to clear the impression roll. It is apparent that, when the knob is set to "multi" position, it is not desirable to impart a "kick" to the envelope for the reason that the stamp impressions would be too far spaced, whereas it is necessary that they be contiguous to each other. A retarding means in the form of spring 32 is, therefore, provided. As hereinbefore stated, the degree of retardation may be varied by turning the knurled head 33' of threaded bolt 33 so that, depending on the type of mail matter being stamped, the proper resistance to obtain accurately spaced successive stamp impressions is provided.

For some operations it is desirable to render spring 32 entirely ineffective. In order that pressure may be readily and quickly removed from the spring, bolt 33 is threaded in a swiveled block 163 pivotally secured to bracket 29 by means of a bolt, the head of which is indicated at 164. The adjusting piece can thus be swung to a substantially horizontal position out of contact with spring 32, the latter member straightening more or less when relieved of pressure. Parcel post strips and other matter requiring special attachments having their own retarders make the use of spring 32 unnecessary.

The machine is compact, and, when it is assembled, the fastening devices, such as screws, etc., are of a character which prevent disassembling of the meter housing and postage setting mechanism so that fraudulent operation of the machine is impossible. The meter housing, when removed from the machine, occupies very little space and can be conveniently carried to the post office or other government office. A handle 165 is provided for this purpose.

Although the preferred form of the invention has been described in detail, it is to be understood that various changes may be made in the several combinations and sub-combinations and it is, therefore, intended that the following claims be construed to include such modifications as might be made in the numerous details of the machine.

What is claimed is:—

1. In a combined postage printing and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and roll in timed relation; means for moving said roll into cooperative relation with the die to print postage on mail matter; and means associated with said roll moving means for varying the effective pressure exerted by the roll on the mail matter during the printing operation.

2. In a combined postage printing and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and roll in timed relation; cam means for moving the impression roll into cooperative relation with the die to print postage on mail matter; a spring interposed between said cam means and the roll; and means for adjusting the compression of said spring to vary the effective pressure exerted by the roll on the mail matter during the printing operation.

3. In a combined postage printing and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and roll in timed relation; a base; an arm pivoted on the base and carrying the impression roll; a toggle adapted to move said arm and roll into cooperative relation with said die to print postage on mail matter; cam means for operating the toggle; and means interposed between the toggle and the cam for varying the effective pressure exerted by the roll on the mail matter during the printing operation.

4. In a combined postage printing and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and roll in timed relation; a base; an arm pivoted on the base and carrying the impression roll; a toggle adapted to move said arm and roll into cooperative relation with said die to print postage on mail matter; a cam rotatable with the die carrier; a lost motion connection between the cam and said toggle; spring means associated with said connection; and means for adjusting the compression of said spring means to vary the effective pressure exerted by the roll on the mail matter during the printing operation.

5. In a combined postage printing and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and roll in timed relation; a base; an arm pivoted on the base beneath said carrier and carrying the impression roll; a toggle adapted to lift said arm and roll into cooperative relation with said die to print postage on mail matter; a cam rotatable with the die carrier; means including a spring interposed between the cam and the toggle for straightening the toggle thereby to lift said arm; and means for adjusting the compression of said spring to vary the effective pressure exerted by said roll on the mail matter during the printing operation.

6. In a combined postage printing and registering machine, a rotatable die carrier; a housing for said carrier; a substantially horizontal table fixed with respect to said housing for supporting mail matter; a plurality of dies on said carrier; a rotatable impression roll; said table being disposed between the axes of said carrier and said roller; means for rotating said carrier and roll in timed relation, said dies and roll cooperating to print postage on mail matter; means for moving said roll relatively to said table and into cooperative relation with a single die; other means for moving said roll into cooperative relation with a plurality of dies; means associated with said roll and adapted to co-act with one or the other of said roll moving means; and means for selectively positioning said coacting means with respect to said roll moving means.

7. In a combined postage printing and registering machine, a rotatable die carrier; a housing for said carrier; a substantially horizontal

table fixed with respect to said housing for supporting mail matter; a plurality of dies on said carrier; a rotatable impression roll; said table being disposed between the axes of said carrier and said roller; means for rotating said carrier and roll in timed relation, said dies and roll cooperating to print postage on mail matter; a pair of dissimilar cams rotatable in timed relation with said carrier; means including a follower coacting alternately with said cams for moving said roll relatively to said table and into cooperative relation with said dies; and means for selectively shifting said follower to either of said cams to move the roll into cooperative relation with a single die when one of said cams engages the follower and with a plurality of dies when the other of said cams engages the follower.

8. In a combined postage printing and registering machine, a rotatable die carrier; a housing for said carrier; a substantially horizontal table fixed with respect to said housing for supporting mail matter; a plurality of dies on said carrier; a rotatable impression roll; said table being disposed between the axes of said carrier and said roller; means for rotating said carrier and roll in timed relation, said dies and roll cooperating to print postage on mail matter; a pair of dissimilar cams rotatable in timed relation with said carrier; a rockable arm for supporting said roll; means including a follower coacting alternately with said cams for rocking said arm to move said roll relatively to said table and into cooperative relation with said dies; and means for selectively shifting said follower to either of said cams to move the roll in cooperative relation with a single die when one of said cams engages the follower and with a plurality of dies when the other of said cams engages the follower.

9. In a postage printing machine, a rotary printing member and an impression roll adapted to cooperate with said member to print postage on mail matter; retarding means comprising a leaf spring positioned in advance of said member and roll for resisting passage of the mail matter through the machine; and means acting on the spring to tension said spring, said means being adjustable to vary the pressure on the spring.

10. In a postage printing machine, a rotary printing member and an impression roll adapted to cooperate with said member to print postage on mail matter; retarding means comprising a leaf spring positioned in advance of said member and roll for resisting passage of the mail matter through the machine; and means acting on the spring to tension said spring, said means being swingable to a position in which the tensioning means is disengaged from said spring.

11. In a combined postage printing, and registering machine, a die carrier; a die on said carrier; a rotatable impression roll; means for rotating said carrier and said roll; means for moving said roll into cooperative relation with said die to print postage on mail matter; and yielding means interposed between said roll moving means and said roll for varying the effective pressure exerted by the roll on the mail matter during the printing operation.

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