

March 11, 1941.

L. A. THATCHER

2,234,583

LETTER OPERATED PRINTING DEVICE

Original Filed Dec. 2, 1937

6 Sheets-Sheet 1

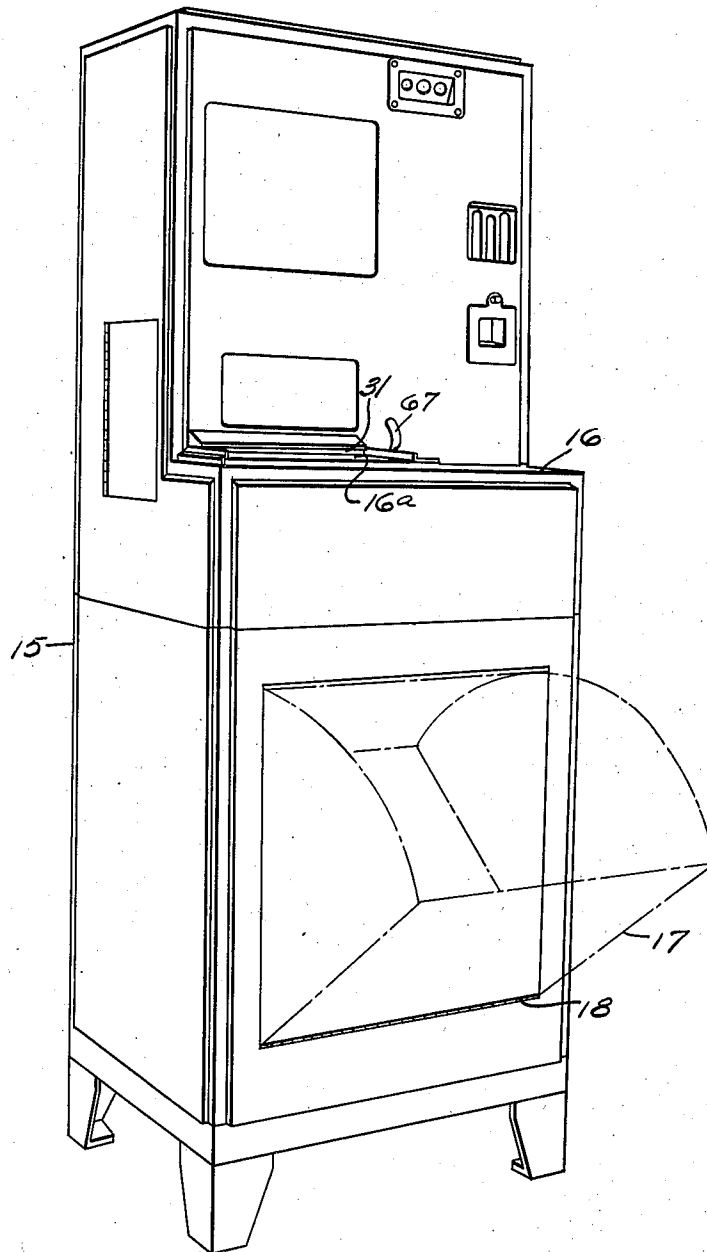


FIG. 1.

INVENTOR
Linden A. Thatcher
BY
Edwin H. Owen
ATTORNEY

March 11, 1941.

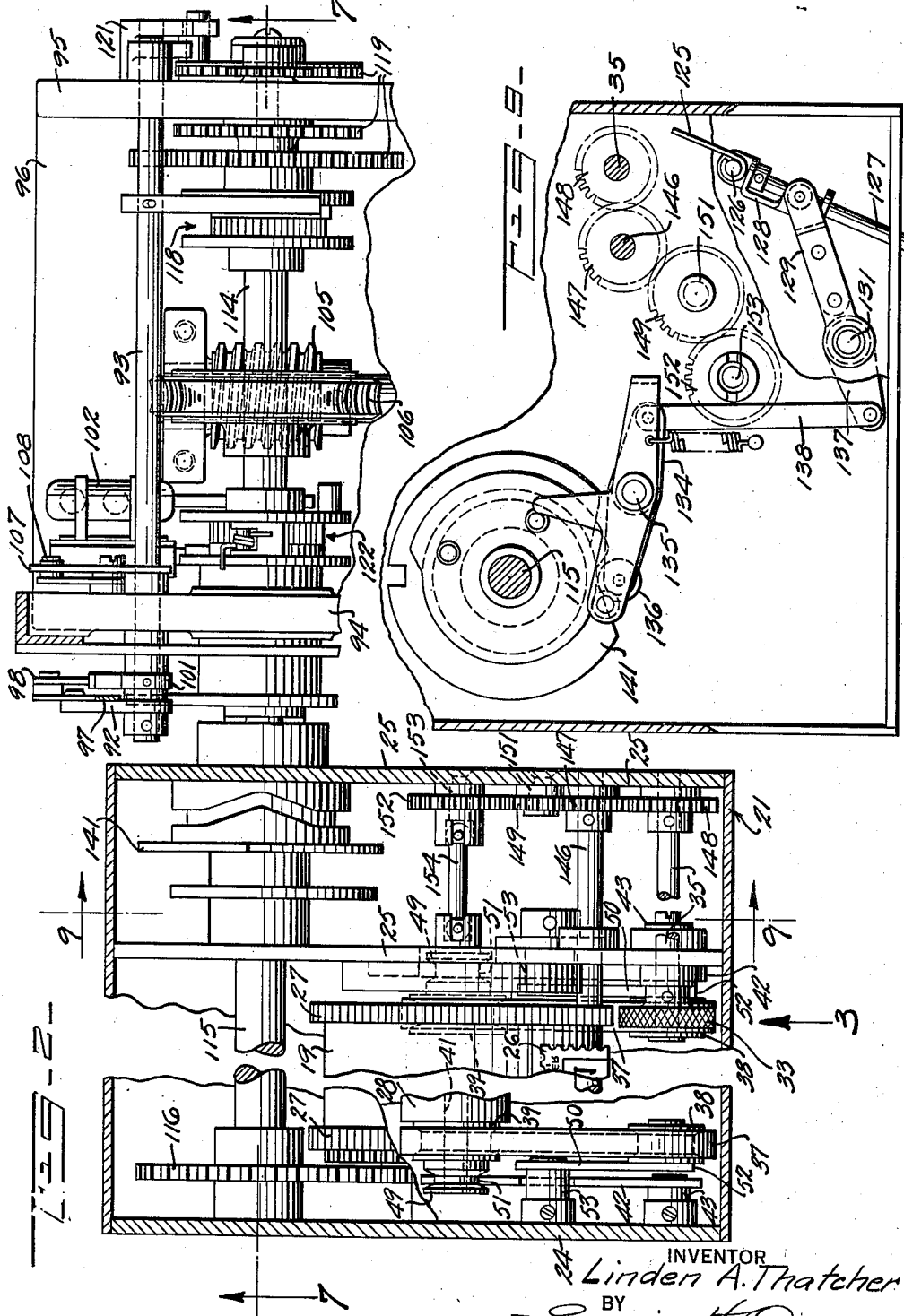
L. A. THATCHER

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6. Sheets-Sheet 2



INVENTOR
Linden A. Thatcher
BY
Edwin H. Owen
ATTORNEY

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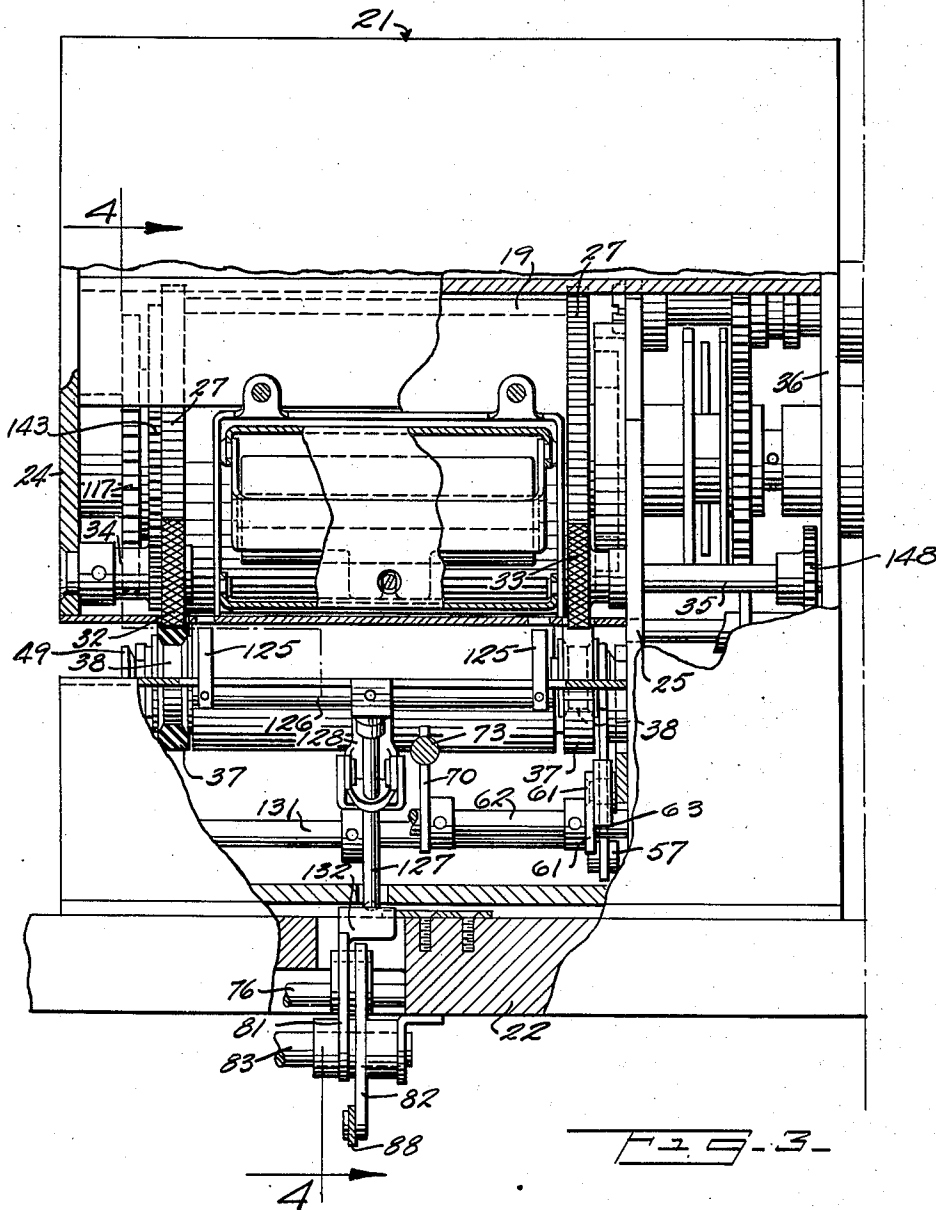
L. A. THATCHER

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LETTER OPERATED PRINTING DEVICE

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6 Sheets-Sheet 3



INVENTOR
Linden A. Thatcher
BY
Edwin H. Owen
ATTORNEY

March 11, 1941.

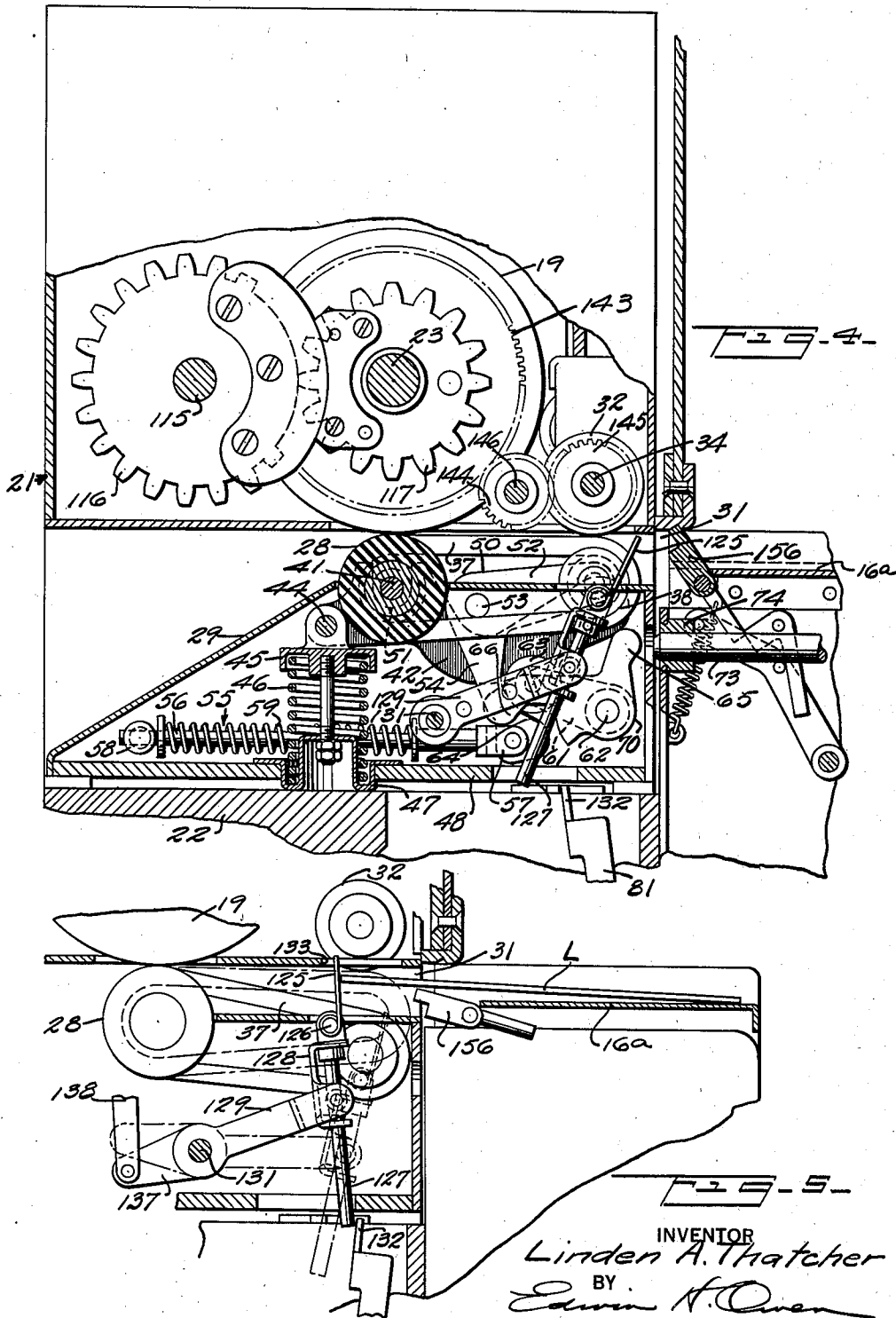
L. A. THATCHER

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LETTER OPERATED PRINTING DEVICE

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6 Sheets-Sheet 4



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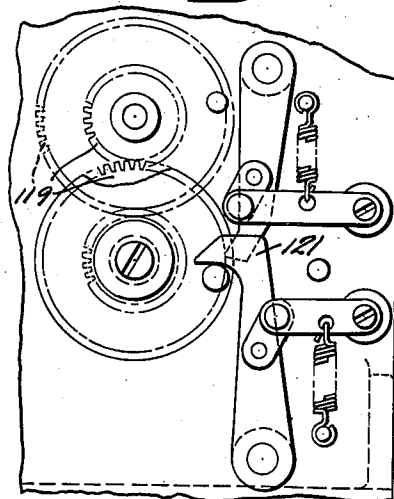
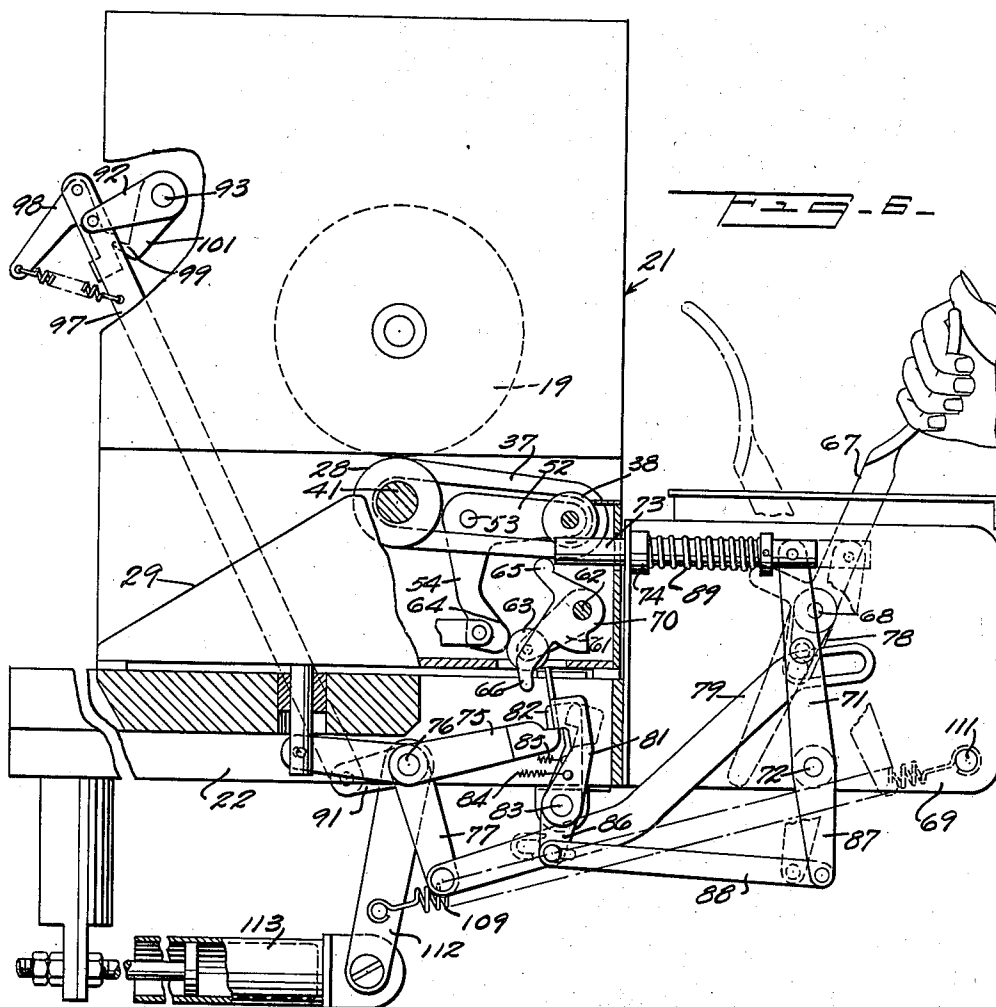
L. A. THATCHER

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6 Sheets-Sheet 5



INVENTOR
Linden A. Thatcher
BY
Edwin H. Owen
ATTORNEY

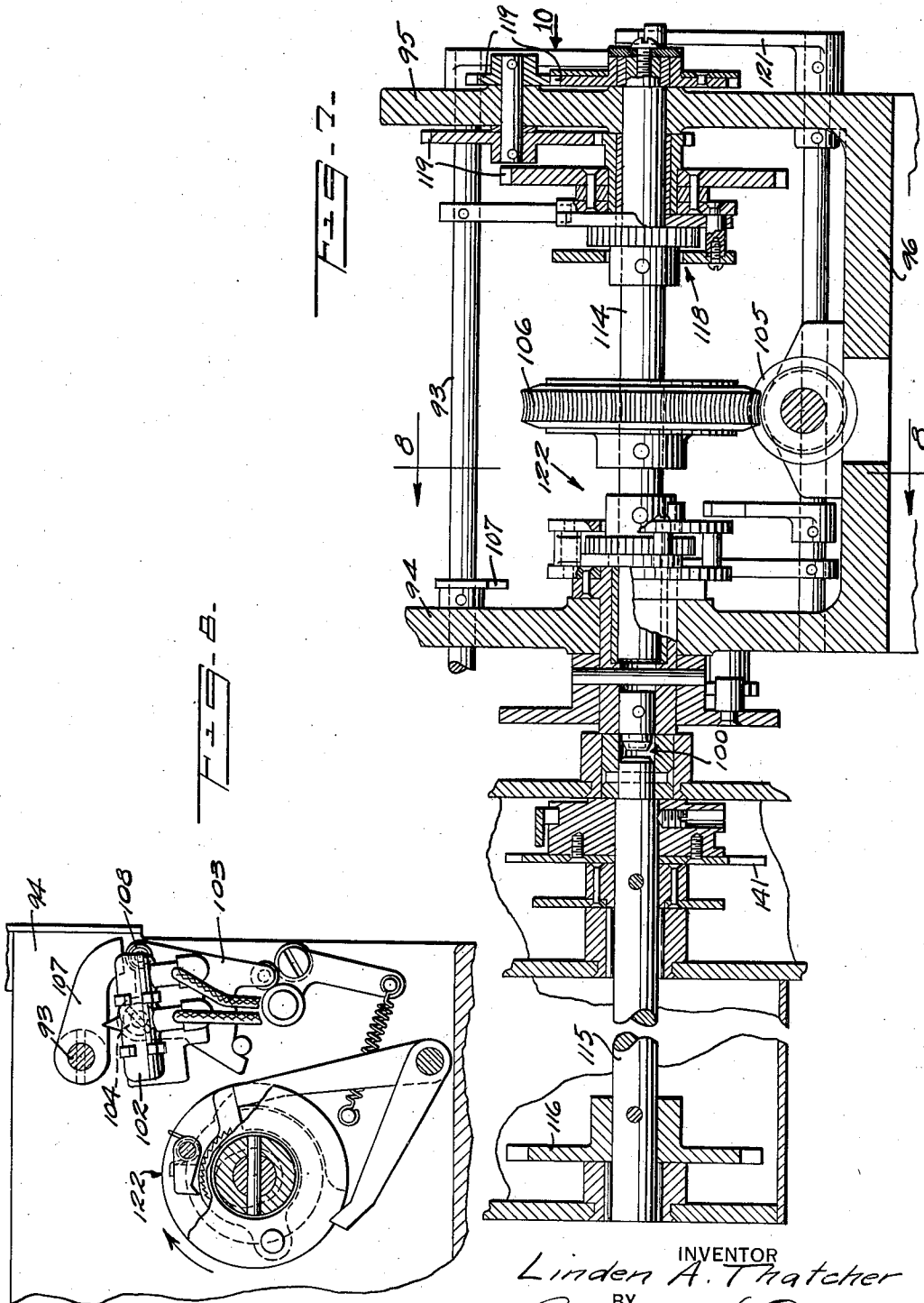
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L. A. THATCHER

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LETTER OPERATED PRINTING DEVICE

Original Filed Dec. 2, 1937 6 Sheets-Sheet 6



INVENTOR
Linden A. Thatcher
BY
Edwin H. Owen
ATTORNEY

UNITED STATES PATENT OFFICE

2,234,583

LETTER OPERATED PRINTING DEVICE

Linden A. Thatcher, Stamford, Conn., assignor to
Pitney-Bowes Postage Meter Company, Stamford,
Conn., a corporation of Delaware

Original application December 2, 1937, Serial No.
177,671. Divided and this application July 11,
1939, Serial No. 283,766

7 Claims. (Cl. 101—235)

This invention relates to a postage printing and mailing machine and more particularly to a machine of the coin operated type which is adapted to print a value postage stamp impression upon letters which are inserted therein, then automatically deposit the letters in a mail receiving receptacle which is concealed within a casing enclosing the machine.

The present invention is more specifically related to devices for conveying a letter to a printing position after it has been inserted in the machine, and to devices which control the position of the letter at the time of tripping to effect the printing of the postage stamp impression in proper relation to the leading edge of the letter. Further, the subject matter of this case is a division of a parent application Serial No. 177,671, now Patent No. 2,170,270, dated August 22, 1939.

It is one object of the invention to provide means for conveying a letter to a printing position after the said letter has been inserted in the machine, and to continue the movement of the letter to deposit same within a mail receptacle.

It is another object to provide a tripping means which is actuated by the act of inserting a letter in the machine and which is operable only when the letter is in a correct position for printing.

It is a further object to provide means whereby said conveyor parts may be spaced vertically apart to permit the insertion of the letter to a tripping position.

It is a further object to provide means whereby the conveyor is adapted to be returned to its conveying position after the act of tripping is effected.

It is a further object to provide manipulative means whereby devices associated with the printing and conveyor drive are adapted to be pre-set before a tripping operation is effected.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Fig. 1 is a perspective view looking toward the outside of the machine casing and showing the

letter receiving receptacle in dot and dash lines in an open or letter collecting position;

Fig. 2 is a plan view with part in section and part broken away, showing the printing unit and conveyor mechanism, also a part of the drive controlling means;

Fig. 3 is a front view of the printing unit shown in Fig. 2 taken in the direction of the arrow 3, parts being shown in section and parts broken away, and further including a letter tripping device;

Fig. 4 is a vertical sectional view through the printing unit taken along the line 4—4 of Fig. 3 and showing the printing drum conveyor mechanism and printing device in its normal home position;

Fig. 5 is a fragmentary detail view of certain of the parts shown in Fig. 4, with the conveyor mechanism shown in a spaced apart position and a letter being inserted into the machine to a position where the tripping of the machine is about to be effected;

Fig. 6 is a view taken on substantially the same plane as Fig. 5 and further shows manipulative means for pre-setting a latching mechanism and setting the conveyor in a letter receiving position prior to inserting a letter in the machine;

Fig. 7 is a vertical sectional view taken along the line 7—7 of Fig. 2, showing the drive connection to the printing unit;

Fig. 8 is a fragmentary detail view partly in section, taken along the line 8—8 and showing an electrical switch controlled mechanism;

Fig. 9 is a fragmentary detail view partly in section, taken along the line 9—9 of Fig. 2 and showing part of the trip controlling mechanism and conveyor drive; and

Fig. 10 is a fragmentary detail view looking in the direction of the arrow 10 of Fig. 7.

Referring to Fig. 1, it will be seen that the machine is a coin operated machine, but as the invention herein described pertains to the printing and conveying devices, the description will only be related to such mechanism.

A casing is generally shown at 15 which encloses the entire machine and is provided with a platform 16, a portion 16a of which is used to support a letter before inserting same within the machine. A letter receiving receptacle 17 is mounted within the lower portion of the machine casing and may be hinged as shown at 18 to permit same to be swung forward by an authorized mail collector for the collection of mail deposited therein.

A printing drum 19 is encased within a closure

21, which closure is removably mounted within the machine and is normally supported upon a suitable frame 22. The printing drum is mounted upon a shaft 23 carried by one wall 24 and another wall 25 of the closure 21. An indicia die plate 26 bearing the usual postmark, date and value stamp is mounted on the drum as indicated in Fig. 2. Flanges 27, having serrated edges, are provided at the ends of the drum 19 and co-operate with conveyor belts 37 and an impression roller 28, Fig. 4, in feeding a letter during a printing cycle of operation, and further to continue the feed of the letter after printing for the final deposit of said letter in the receptacle 17. As shown in Fig. 4, the letter will be guided to along the guide wall 29 to the receptacle 17.

Associated with the printing drum is a conveyor mechanism which is adapted to convey a letter to the printing drum, after the letter has been inserted in the machine through a letter slot 31 provided in the front wall of the machine casing. Said conveyor mechanism preferably comprises means for driving the letter by contact with both the upper and the lower surfaces. The upper drive comprises two drive rollers 32—33, the said roller 32 being suitably supported on a stud 34 supported in the closure wall 24, and the roller 33 being mounted on a shaft 35 which is carried by the wall 25 and a wall 36 of the closure 21. The lower portion of the conveyor comprises a pair of belts 37—37 which are supported on forwardly disposed pulleys 38—38 and rearwardly disposed pulleys 39—39. The rearward pulleys 39—39 are fixed to a shaft 41 which shaft also supports the impression roller 28.

In order that the impression roller 28 may yield to accommodate mail of various thickness, the said shaft 41 is supported on a floating bearing structure which comprises arms 42—42 having one end thereof pivotally mounted upon studs 43—43 in the walls 24 and 25 respectively of the closure 21. The opposite ends of said arms 42—42 engage a rod 44, which rod is supported in a yieldable bearing 45, Fig. 4. Said yieldable bearing comprises a cap portion which fits over the upper end of a coil spring 46, which spring is seated in a bracket 47 secured to the base 48 of the closure 21.

Grooved rollers 49—49 mounted at either end of the impression roller shaft 41 are supported within pockets 51—51 of said arms 42—42. A letter upon passing between the printing drum and impression roller will therefore depress the impression roller mounting 45 and 46 in proportion to the thickness of the said letter.

The forward belt supporting pulleys 38—38 are mounted on the free ends of arms 52—52, of levers 50—50 which levers are pivotally mounted upon studs 53—53, carried by the walls 24 and 25 of the closure 21. Each of said levers 50—50 has an arm 54 projecting downwardly therefrom which latter arms are normally urged in a forwardly direction by means of spring actuated pressure devices 55—55, Fig. 4. Said pressure devices 55 each comprise a rod 56 which has a clevis end thereof 57 connected with the lower end of the arm 54 and the opposite end is slidably mounted in bearings 58—58. A compression spring 59 provides the necessary pressure to maintain the conveyor belt associated therewith in a conveying position.

Means is also provided to rock the forward portions of the conveyor belts away from the rollers 32, 33 for the purpose of permitting the leading end of a letter to be inserted between said belts

and rollers when it is passed into the letter slot 31. Said means comprises arms 61—61 which are fixed to a shaft 62, supported within the walls 24 and 25, which arms have fixed to their forward end, rollers 63—63. Said rollers 63—63 are adapted to engage cam surfaces 64—64 provided on each of the downwardly disposed arms 54—54. Also fixed on the shaft 62 is a rocker lever 70 which has one arm 65 projecting upwardly therefrom and a side-wardly projecting arm 66. Said lever 70 is adapted to be rocked manually in one direction as shown in Fig. 6 to cause the rollers 63—63 to ride downward over the cam portions 64—64 of the arms 54—54 to thereby rock said arms 54—54 and cause the forward ends of the conveyor belts 37—37 to be moved downwardly.

The rocking of said rocker lever 64 is effected by means of a manually operated hand lever 67, Fig. 6. Said lever 67 is pivotally supported upon a stud 68 secured within a supporting wall 69. Co-operating with said hand lever 67 is another lever 71 which is pivotally mounted upon a stud 72 in the wall 69, which lever has an upwardly extending portion secured to a plunger rod 73. Said plunger rod 73 is slidably mounted within a bearing 74 and is normally positioned as shown in Fig. 4. When the lever 67 is moved from the dot and dash line position of Fig. 6 to the full line position, the lever 71 is rocked in a counter-clockwise direction to effect movement of the plunger 73 forwardly into engagement with the arm 65 of lever 70 thereby causing the shaft 62 to be rocked in a counter-clockwise direction and consequently causing the rollers 63—63 on levers 61—61 to ride over the cam portions 64—64 of arms 54—54. Said latter action will cause the conveyor belt supporting arms 52—52 to be rocked downwardly to the position of Fig. 5.

Associated with said manual setting lever 67 is a latching structure which comprises a latch lever 75, fixed on a rocker shaft 76, said shaft being supported within the frame structure 22. The shaft 76 is adapted to be rocked by means of the hand lever 67 through the connection of a lever 77 on said shaft 76 with the downwardly projecting end 78 of the lever structure 67, said connection being made by means of a link 79.

A latch hook lever 81 and a safety latch 82 are freely mounted on a shaft 83 which shaft is carried by the frame structure 22. Said latch 50 members 81 and 82 are normally urged toward the latch lever 75 by means of springs 84 and 85 respectively. Upon pulling the hand lever 67 to the full line position of Fig. 6, the latch lever 75 is rocked downward to a latch engaging position with relation to the latch hook 81 and safety latch 82, as shown in Fig. 6. The safety latch lever 82 has a tail portion 86 which is linked to a tail portion 87 of the lever 71, by means of a link 88, so that it may be positively moved into latched relation with the latch lever 75. Upon the return of the handle 67 to its dot and dash or normal position, the said safety latch is disengaged. The return of said hand lever 67 is effected by means of a compression spring 89 65 around the plunger pin 73.

At the time of setting or engaging the latch lever 75 with latch members 81—82 by means of the hand lever 67, a switch control latching device is also set in a latched position. Said switch control latching device comprises a lever 91 on the shaft 76, which lever is connected with another lever 92 on a shaft 93 by means of a link 97. The shaft 93 is supported within walls 94—95 of a frame structure 96, Fig. 2. The link 75

engagement with a pinion 145 on conveyor roller 32, the said roller 32 is driven. By an indirect connection through shaft 146, which supports the pinion 144 and which extends to the wall 25 of the closure 21, a drive is provided through a pinion 147 on shaft 146 to a pinion 148 on the shaft 35 which supports the conveyor drive roller 33, Figs. 2 and 9. Rotation of the gear 143 with the printing drum therefore, will effect the drive of the conveyor drive rollers 32 and 33.

Rotation of the gear 143 will further effect rotation of the impression roller 28, through the intermediate pinion 149 on stud 151, Figs. 2 and 9, which pinion 149 meshes with a pinion 152 on stud 153. Said pinion 152 is connected with the impression roller shaft 41 by a flexible drive shaft 154. As previously stated, the rearward conveyor belt pulleys 39—39 are fixed to the shaft 41 and are therefore rotated with the impression roller. It is thus evident from the above that, upon rotation of the printing drum, both the conveyor drive rollers 32, 33 and the conveyor belts are driven.

It will be noted in Fig. 4, that the letter slot 31 is normally obstructed by a shutter 156. Said shutter is released to permit the insertion of the letter after the hand lever 67 is manipulated, there being a connection with said hand lever control which is fully described in the parent case.

In the operation of this device, the mechanism is pre-set by pulling the handle 67 forward from the dot and dash line position to the full line position as shown in Fig. 6. This operation effects the setting of several devices as follows:

1. The forward end of the conveyor belts are lowered by the action of the rollers 63—63 over the cammed ends 64—64, of lever arms 54—54, when the plunger 73 engages the upwardly disposed end 65 of lever 70, as shown in Fig. 6;

2. The latch member 81 is engaged with the latch lever 75 when the said lever is rocked through the link connection 79 with lever arm 78;

3. The switch tripping latch members 98 and 101 are set in a latched position;

4. The shaft 76 is spring loaded by the action of spring 109.

Having thus pre-set the machine, a letter is inserted through the slot 31 and moved inward to cause the leading end thereof to engage trip fingers 125—125 and thereby rotate the trip or trigger unit about its pivot until the backs of said fingers 125—125 engage a stop 133. The engagement with the stop 133 limits the inward movement of the letter by the operator momentarily and thus locates same properly with respect to the conveyor drive mechanism to provide for the proper placement of a stamped impression thereon when the drive or feed of said letter is effected. The movement of said trigger member also causes the lower end of the rod 127 to engage plate 132 of latch member 81 to release said latch member from engagement with the latch lever 75.

The release of the latch member 81 effects the operation of the following mechanism:

1. Shaft 76 is rocked in a counter-clockwise direction as viewed from Fig. 6, under the impulse of the spring 109;

2. Latch lever 75 is rotated with said shaft 76 to cause the free end thereof to engage with the end 66 of lever 70 to thereby rotate said lever 70 and shaft 62 in a clockwise direction. Said rotation of shaft 62 causes the cam rollers 63—63

to pass upwardly over the cam ends 64—64 of arms 54—54 to permit the return of the conveyor belts to a conveying position under the influence of spring pressed rods 56—56;

3. The rotation of said shaft 76 also effects movement of the lever 91 which pulls the link 97 in a downwardly direction to rock lever 101 and shaft 93 in a counter-clockwise direction as viewed from Fig. 6;

4. Rotation of the shaft 93 effects the rocking of lever 107, Fig. 8, which in turn engages the lug 138 of the switch mounting 103 to rock same about its pivot 104 in a clockwise direction as viewed in Fig. 8 to cause an electrical contact to be made to the motor drive;

5. The motor drive directly effects the rotation of the drive unit or worm 105 and worm wheel 106 to rotate the drive shaft 114, Fig. 7;

6. Rotation of the drive shaft 114 controls the drive of shaft 115 to finally effect the rotation of the printing drum through the Geneva drive 116—117, Fig. 4;

7. The rotation of the printing drum effects the drive of the upper conveyor rollers 32 and 33 and the drive of the conveyor belts 37—37;

8. By the time the drive of said conveyor rollers and belts are effected, fingers 125—125 of the trigger unit will have been removed from the path of the letter by means of the cam 141, lever 134 and connection 138 to lever 137 which rocks the shaft 131 and yoke supporting lever 129.

The letter is then fed into the machine, whereupon it is picked up by the printing and impression members 19 and 28 respectively to receive the printed postage stamp impression thereon and is finally guided along chute 29 into the mail depositing receptacle 17. The rotation of the printing drum is limited to one revolution under control of the Geneva drive 116—117, and the shaft 115 is limited to the rotation of one revolution under control of the clutch mechanism 122. Details of the clutch member control will be found in the parent case.

Having described the invention what is claimed is:

1. In a postage printing and mailing machine, a printing device, a casing enclosing said printing device and having an opening for the reception of letters, conveyor means arranged above and below the path of the letter, a drive for said printing device and conveyor means, a trip operable upon engagement of a letter therewith to effect the operation of said drive upon inserting a letter into the machine, means to move one conveyor means away from the other conveyor, means to permit the insertion of a letter to a tripping position, and means associated with the trip to return said conveyor to a letter engaging and driving position.

2. In a postage printing and mailing machine, a printing device, a casing enclosing said printing device and having an opening for the reception of letters, conveyor means arranged above and below the path of the letter, a drive for said printing device and conveyor means, a trip operable upon engagement of a letter therewith to effect the operation of said drive upon inserting a letter into the machine, said trip including a member projecting into the path of the leading end of a letter, a stop to limit the movement of said projecting member to thereby accurately position the letter for the placing of a stamp impression thereon, and means operated by the drive to remove the projecting member from the path of the letter after reaching said stop position.

97 also has pivotally mounted at the upper end thereof a latch lever 98, which is adapted to be normally urged to move about its pivot in a counter-clockwise direction, as viewed from Fig. 6, and is adapted to be moved into latched engagement with a toe portion 99 of a lever 101 fixed to the shaft 93. It will be seen therefore that the rocking of the shaft 76 to move the latched lever 75 to a latching position, will also effect movement of latch lever 98 and lever 101 to a latched position.

Referring to Fig. 8, a mercury switch 102 is shown which is carried by a bracket 103, pivotally mounted at 104 on the wall 94 of the frame structure 96. The said mercury switch 102 is electrically connected with a motor drive (not shown) and when moved to a contact position will effect the operation of a power drive unit, indicated in Fig. 7, by the worm 105 and worm wheel 106. Said mercury switch 102 may be moved to a contact position by means of a lever 107, fixed to the shaft 93, when said shaft is rocked during the tripping operation of the machine. The tripping operation will effect the release of latch member 81 from its hooked engagement with the latch lever 75, which will effect the rocking of the rocker shaft 76 and consequently rock the shaft 93, through the controlling link 97, also latch parts 98 and 101. Upon rocking said shaft 93, the lever 107, Fig. 8, will engage a lug 108 on the switch mounting bracket 103 to cause said bracket and switch to be rocked about the pivot 104 and move the switch to a contact position. Resetting of the switch to a non-contact position is effected at the end of each cycle of operation.

The power to effect the rocking movement of the shaft 76 is provided by means of a spring 109, Fig. 6, which is stretched between an anchor pin 111 on wall 69 and a lever 112, said lever 112 being fixed to the rocker shaft 76. A dash pot 113 may be provided to ease the action of the spring 109.

The drive of the printing drum 19 is effected through the worm wheel 106 which drives the shaft 114 carried by the walls 94-95 of the frame 96, said shaft being coupled at 100 with a secondary drive shaft 115, supported between the walls 24 and 25 of the closure 21. By means of a Geneva or mutilated gear 116, Fig. 4, on said shaft 115, which gear is associated with a gear 117 on the drum shaft 23, the said printing drum 19 is rotated. The said Geneva drive is provided to permit certain operations to be performed before and after a printing cycle of operation is effected. But, as these operations have no bearing upon the features in this divisional case, no further description is deemed necessary.

The same reasoning as above may be applied to the operation of the drive mechanism the features of which form no important part of the structure pertaining to this case. Any detail description may be obtained by reference to the parent case.

The drive normally is controlled through a clutch mechanism indicated generally at 118, which cooperates with a coin controlled value type setting structure (not shown) and includes a time control unit through gears 119 and trip lever 121, Fig. 10, which control the operation of a second clutch device indicated at 122. The operation of said second clutch device directly controls the rotation of the shaft 115 which drives the Geneva gear 116.

Before drive of the machine may be effected,

the latch 81 is tripped by the engagement of the leading end of a letter L with a tripping device or trigger unit, when the said letter is inserted in the letter slot 31. As best shown in Figs. 3, 4, and 5, the said tripping device or trigger unit comprises two trip fingers 125-125 which are mounted on opposite ends of a horizontally disposed bar 126. A central vertically disposed rod 127 is secured to the bar 126 by means of a yoke bracket 128 to thus form a T-shaped structure, said yoke bracket being pivotally mounted within a forked end of a lever 129, which lever is fixed to a shaft 131. The yoke bracket 128 comprises a structure resembling an inverted cross with a vertically disposed portion arranged to form a swivel for the vertical rod 127, horizontal bar 126 and fingers 125-125. Said yoke bracket further has a horizontally disposed portion arranged to provide a pivot about which the rod 127 may swing through a vertical path. This arrangement provides for a universal movement about a vertical and a horizontal axis. The purpose of movement about the vertical axis is to prevent a tripping operation from being effected unless both fingers 125-125 are squarely engaged by the letter when it is inserted in the machine. This will insure the correct feed of a letter for the correct placement of a stamp impression on the face of the letter. The lower end of the rod 127 projects directly in the path of a sidewardly disposed blade portion 132 on the latch member 81, and when a letter is inserted through the letter slot 31 into engagement with the fingers 125, as shown in Fig. 5, the rod 127 will engage the blade 132 to rock the latch member 81 about the shaft 83, Fig. 6, and thereby remove same from engagement with the latch lever 75. The fingers 125-125 will be continued in their movement rearward until they engage a stop 133, whereupon the letter will be stopped momentarily.

Immediately upon the release of the latch lever 75 said lever is rocked upwardly under the influence of spring 109 and the outer end thereof engages with the arm 66 of lever 64. This will cause the shaft 62 to be rocked and consequently rock the roller 63 past the cam portions 64-64 of arms 54-54 which support the forward ends of the conveyor belts. Such action will effect the return of the belts to their normal driving position in driving relation with the letter.

Upon reaching the stop position, the said fingers 125-125 are immediately withdrawn to permit the feed of the letter to a printing position. Withdrawal is effected in the manner best shown in Fig. 9 by means of a cam controlled structure which comprises a rocker lever 134, pivotally mounted upon a stud 135, which lever carries a roller 136 at one end and has its opposite end connected with a lever 137 by means of a link 138. Said lever 137 is fixed to the shaft 131 which supports the yoke supporting lever 129. A cam 141 is fixed to the secondary drive shaft 115 and has a cam portion which is adapted to engage the roller 136 to rock said lever 134 and consequently effect the rocking of the yoke supporting lever 129 and cause the withdrawal of the fingers 125-125 from the path of the letter.

When the printing drum 19 is driven, a gear 143 fixed thereon, Fig. 4, will rotate therewith and drive an intermediate pinion 144. Said intermediate pinion 144 is the driving element of the entire conveyor device. By direct meshed

3. In a postage printing and mailing machine, a printing device, a casing enclosing said printing device and having an opening for the reception of letters, conveyor means arranged above and below the path of the letter, a drive for said printing device and conveyor means, a trip operable upon engagement of a letter therewith to effect the operation of said drive upon inserting a letter into the machine, a latch structure associated with said drive and trip, manipulative means connected with said latch to effect the setting of the trip in a latched position, devices connected with said manipulative means to move one conveyor means relative to the other conveyor means and thereby permit the insertion of a letter to a tripping position, and means associated with the trip to effect the release of the latch and consequently effect the return of said conveyor to a letter engaging and driving position.

4. In a postage printing and mailing machine, a printing device, a casing enclosing said printing device and having an opening for the reception of letters, conveyor means comprising rollers and belt members respectively arranged above and below the path of the letter, a drive for said printing device and conveyor, a trip to effect the operation of said drive upon inserting a letter into the machine, means to rock the forward end of the belt portion of the conveyor downward to permit the insertion of a letter to a tripping position, and means associated with the trip to return said belt conveyor portion to a letter engaging and driving position.

5. In a postage printing and mailing machine, the combination with a casing having a letter slot to insert a letter therein and further having concealed therein a rotary stamp printing unit and a mail receiving unit; of conveyor mechanism within the casing and adjacent the slot to convey a letter to a printing position when inserted into the letter slot, a drive for said printing unit and conveyor mechanism, letter stop means, drive actuating trip means arranged for engagement by the letter before the letter reaches

a stop position, and means controlled by said drive to remove said letter stop means before the conveyance of the letter to the printing device.

6. In a postage printing and mailing machine, the combination with a casing having a letter slot therein and further having concealed therein a rotary stamp printing unit and a mail receiving unit; of conveyor mechanism within the casing and adjacent the slot to convey a letter to a printing position when inserted into the letter slot, said conveyor mechanism including upper and lower driven members arranged to yieldingly grip and convey the letter between them, manipulative means including connections to said conveyor whereby the upper and lower parts thereof become relatively spaced to permit the insertion of a letter therebetween, a drive for said printing unit and conveyor mechanism, means connected with the drive to normally prevent the actuation thereof, a tripping device connected with said latter means and having a portion thereof positioned in the path of a letter for engagement by the letter upon inserting same into the letter slot, whereby upon tripping said tripping device the conveyor closes to engage the letter and the drive of the printing unit and conveyor is effected.

7. In a postage printing and mailing machine, a printing device, a casing enclosing said printing device and having an opening for the reception of letters, a letter receiving receptacle within the casing, conveyor means arranged above and below the path of the letter in a spaced apart relation, a drive for said printing device and conveyor, a trip to effect the operation of said drive upon inserting a letter into the machine, stop means associated with said trip to limit the initial movement of the letter and normally position the leading end of the letter within the driving range of the conveyor, and means controlled by the trip to move said conveyor into driving relation with the letter after reaching said stop position to thereby draw the letter into the machine and convey same to a printing position.

LINDEN A. THATCHER.