

Dec. 8, 1925.

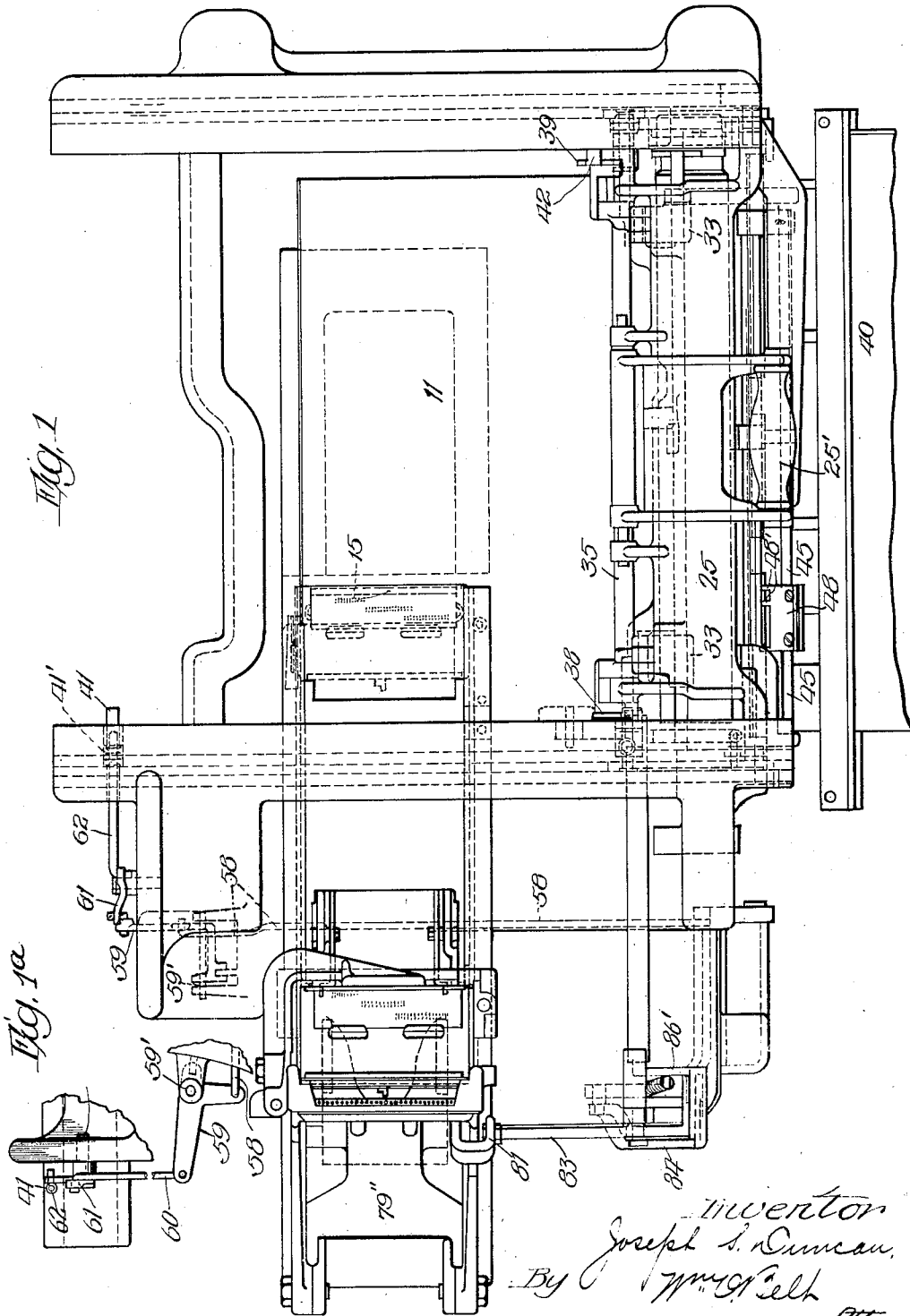
J. S. DUNCAN

1,564,221

SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 1



Dec. 8, 1925.

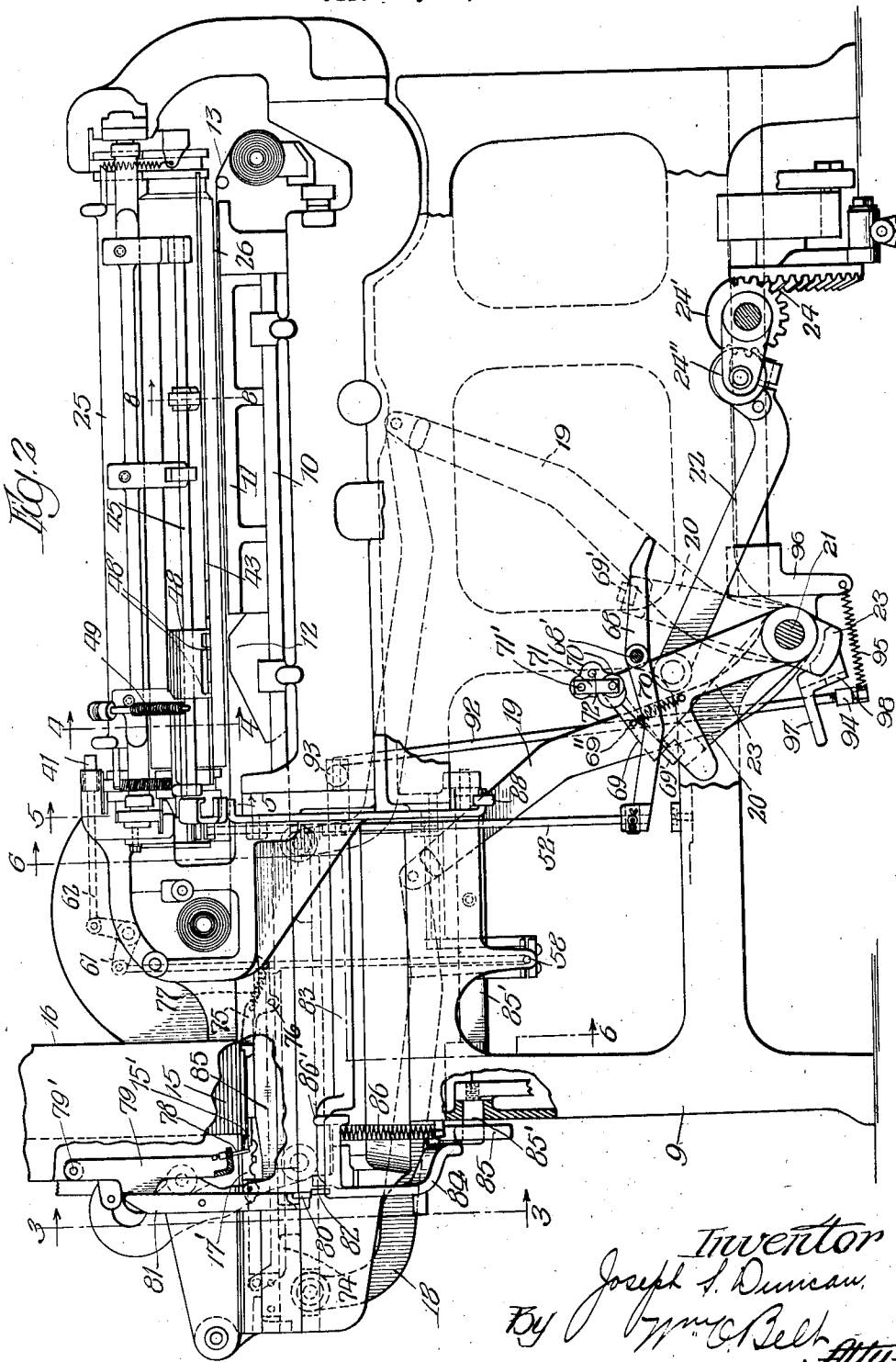
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SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 2



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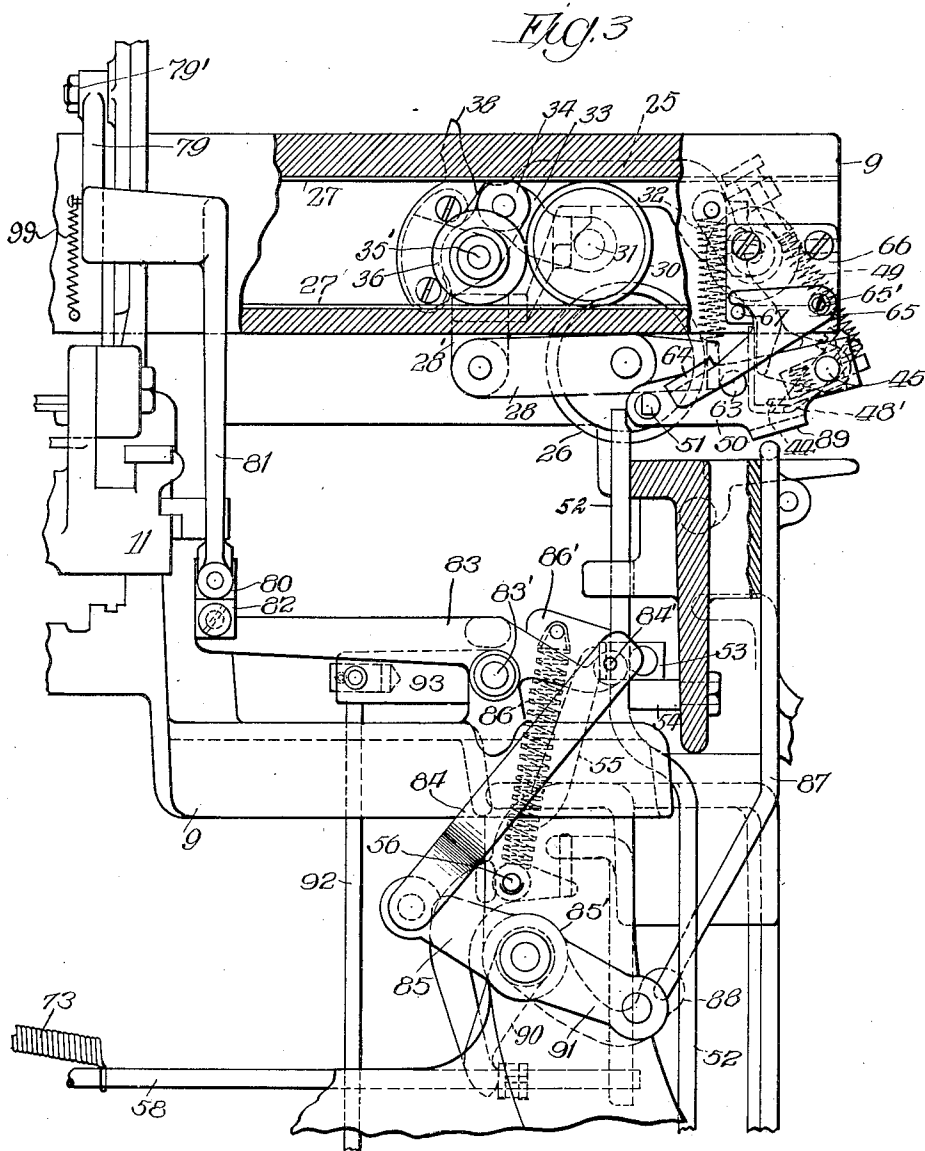
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SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 3



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SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 4

Fig. 4

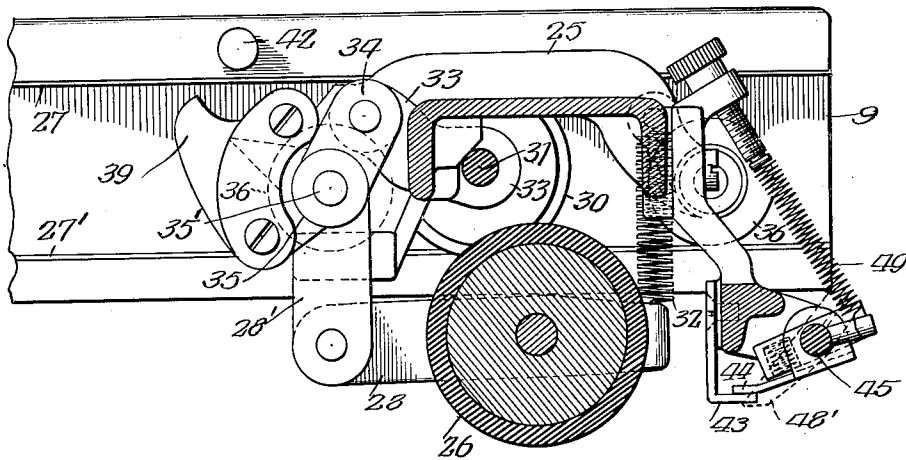
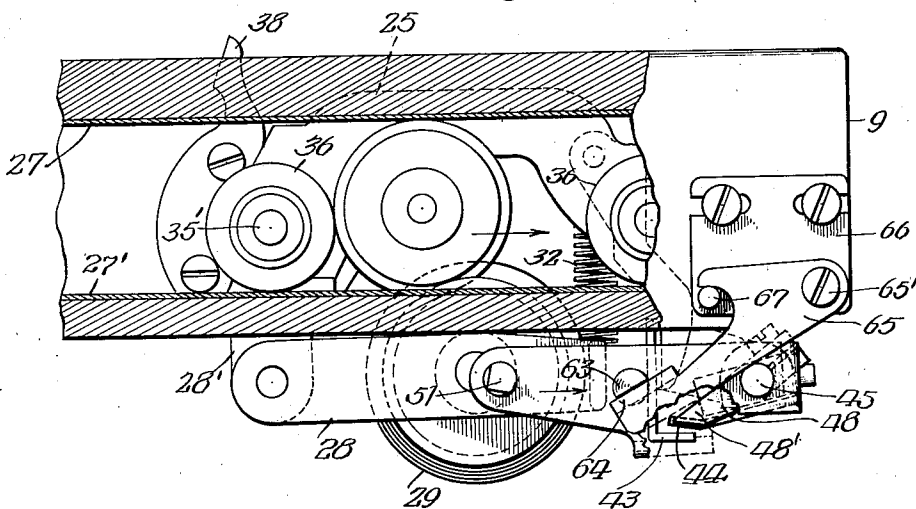


Fig. 5



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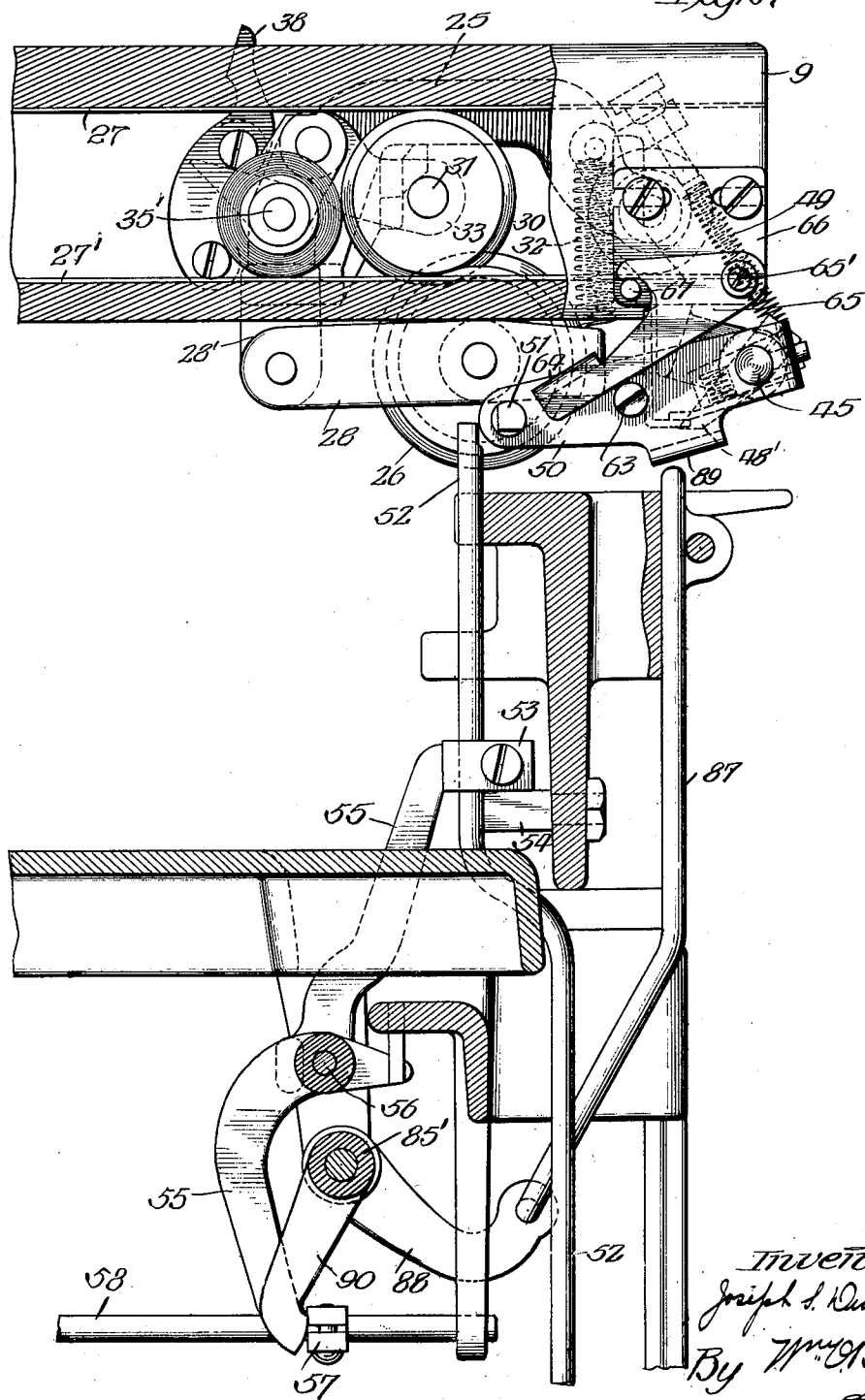
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SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 5

Fig. 6.



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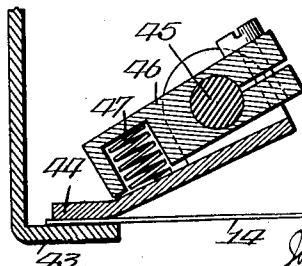
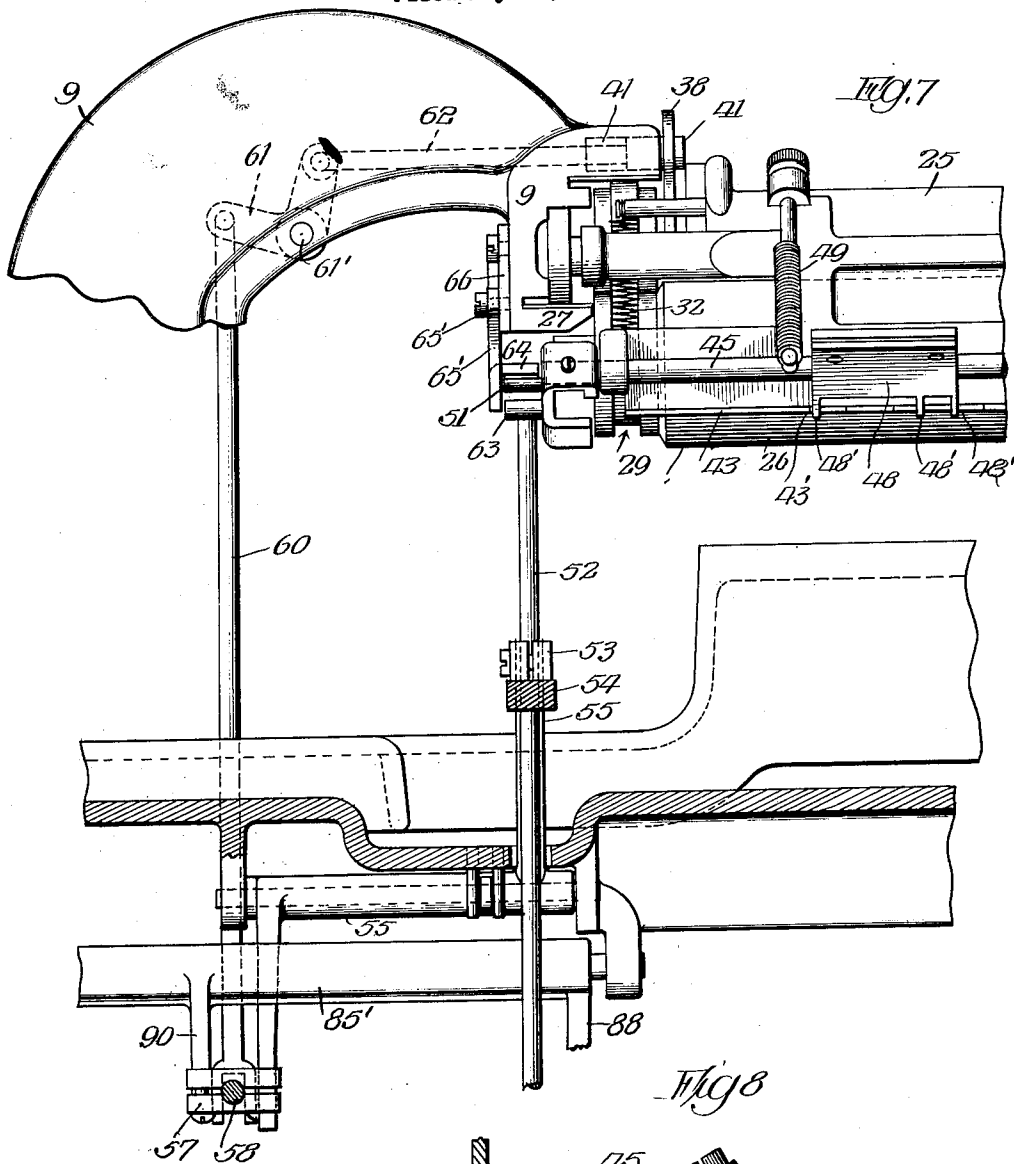
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SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES

Filed May 24, 1920

6 Sheets-Sheet 6



By

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Patented Dec. 8, 1925.

1,564,221

UNITED STATES PATENT OFFICE.

JOSEPH S. DUNCAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ADDRESSOGRAPH COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SAFETY DEVICE FOR PRINTING AND ADDRESSING MACHINES.

Application filed May 24, 1920. Serial No. 383,616.

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety Devices for Printing and Addressing Machines, of which the following is a specification.

This invention has relation to the type of machine set forth in my application Serial No. 123,233 filed October 2, 1916, for a machine for printing, in successive operations, from a single body form and successively changing address forms to produce individually addressed letters having the same subject-matter. In that machine there is a form for the body of the letter which is secured in place on the bed and changeable address forms which are fed one at a time to printing position in proper relation to the body form. The address forms are provided on devices which are preferably arranged in accordance with a card index system and placed in the machine in the form of a stack from the bottom of which they are fed one at a time to printing position. The paper sheets to be printed are fed manually or mechanically to the machine a sheet at a time for each printing operation and an ink ribbon is arranged across the printing forms and is fed in some approved manner. The sheet is arranged in printing position above the ribbon and a platen roller travels over the sheet and causes an impression to be made thereon from the form through the ribbon. In operating the machine in accordance with existing systems now well established for using address devices in addressing machines it is customary to place in the magazine of the machine the entire contents of a drawer holding the address devices systematically arranged even though it is not desired that every one of these devices should print. For example, the addresses for a subscription list may be placed on suitable devices and arranged alphabetically in drawers according to some predetermined system with the expirations indicated by disposing index tabs in proper position along the upper edge of the devices. Various means have been proposed and some of them have been used for automatically selecting the particular devices for the printing operations and for skipping the other printing devices of the stack as they

are fed through the machine. In this connection reference may be made to my Patents No. 1,082,505 dated December 30, 1913, and No. 1,209,414 dated December 19, 1916.

All or most of the operations of the machine are automatic for rapid operation and it is necessary to provide safety means to hold the platen out of operative position until a sheet has been disposed in printing position, so that the platen will not engage the ribbon in event of any failure in the sheet feeding operation; and it is also necessary to temporarily halt the printing device feeding operation so that a device will not pass through the machine unprinted when the platen is held out of printing position because of a failure in the sheet feeding operation. And it is also important to prevent sheets from being fed to the machine in those cycles of operations wherein printing devices are skipped in the automatic selective system and pass through the machine unprinted.

The object of the present invention is primarily to provide automatically operated safety means for preventing the platen roller from operating in printing position in the event that for any reason a sheet to be printed is not disposed in the sheet feeding operation in printing position in the machine, and at the same time to control the printing device feed so that a device which it is desired to print will not pass unprinted through printing position because of the failure of the sheet feeding operation.

A further object of the invention is to prevent the feeding of a sheet to printing position in the event of the failure for any reason of the printing device feed to dispose a printing device properly in printing position.

And a further object of the invention is to prevent the feeding of sheets to printing position in those operations of the machine wherein printing devices are skipped and pass unprinted through the machine in accordance with a selective system and automatically operated means for carrying the same into effect.

In a broad sense the invention seeks to provide simple and automatically operated means for correlating the different operations of the machine in the same respect that the different groups of mechanism are corre-

lated so that one operation will depend upon the others and so that a failure of the operation of one group of mechanism will not disorganize the systematic operation of the machine. For example, in a selected embodiment of the invention a printing device is fed to printing position and a sheet is disposed in printing position and then the platen roller is moved to and through printing position to make the impression. It is the object of my invention to prevent the platen roller from performing its function of making the printing impression if no sheet has been positioned to receive the impression, and to prevent a printing device passing through the machine unprinted because the platen roller skips a printing operation; and also to control the sheet feed by reference to the feeding of those printing devices from which impressions are to be taken.

The invention has other objects in view which will be fully pointed out hereinafter in the detail description of the invention in the selected embodiment thereof illustrated in the accompanying drawings in which—

Fig. 1 is a plan view showing my invention embodied in a printing and addressing machine and as much of the machine as is necessary for understanding the construction and operation of the invention;

Fig. 1^a is a fragmentary elevation of details of the safety means.

Fig. 2 is a side elevation of the machine, partly in section and partly broken away to better illustrate certain parts;

Fig. 3 is an enlarged sectional elevation on a line indicated generally by the line 3—3 of Fig. 2;

Figs. 4, 5 and 6 are sectional views on the lines 4—4, 5—5 and 6—6 respectively of Fig. 2;

Fig. 7 is an enlarged elevation partly in section showing a fragmentary portion of the machine;

Fig. 8 is a sectional view of one of the sheet grippers.

Referring to the drawings and particularly to Fig. 2, 9 is the machine frame, 10 is the bed, 11 is the form for the body of the letter, 12 is the anvil or auxiliary bed to receive and support the printing device in proper relation to the body form 11 for making a printing impression through an ink ribbon 13 upon a sheet 14 which is fed to the machine manually or mechanically as desired. The address or changeable printing devices 15 are arranged in a stack in a magazine 16 and these devices are fed one at a time from the bottom of the stack to printing position on the anvil 12, and after the printing operation is completed they may be disposed of in any suitable manner, for example as set forth in my application hereinbefore referred to. A reciprocating car-

rier frame or slide 17 is provided with one or more dogs or fingers 17' to feed the address printing device one at a time from the stack to printing position, this carrier slide being operated by a link 18 pivoted at one end of the carrier slide and at its other end to a lever arm 19 of the rocker 20 which is pivotally mounted on the shaft 21. A link 22 is pivotally connected at one end to the rocker 23 which is pivotally mounted on shaft 21 and is operated by suitable power devices to impart an oscillating movement to the rocker and thereby cause the carrier slide to reciprocate and feed the address printing devices one at a time to printing position. In the drawings the power devices comprise a toothed segment 24 which is operated from a suitable source of power to impart reciprocating movement to the link 22. A segment gear 24' is operated by the segment 24 and an arm 24'' rigid with the segment gear 24' is pivotally connected to the link 22 so that as arm 24'' swings in an arc the link 22 is reciprocated.

A carriage 25 carrying a platen roller 26 is adapted to be reciprocated back and forth above printing position in suitable guides 27, 27' (Fig. 4) on the frame of the machine. The platen roller (Figs. 4-6) is rotatably mounted in links 28 which are pivotally supported by lugs 28' depending from the platen carriage 25. The platen is provided at its ends with grooved anti-friction rollers 29 and flanged rollers 30 mounted on the shaft 31 and arranged to engage the grooved rollers on the platen which is normally held in elevated position by the spring 32 (Fig. 6). Links 33 are pivotally engaged with the ends of shaft 31 and are pivotally mounted on arms 34 carried by and forming part of the rocker 35. These arms are also pivotally engaged with pivot pins 35' mounted in the carriage frame 25. This frame is supported on carrying rollers 36 which are mounted on the pivot pins 35' and travel on the lower guide 27'. Dogs 38 and 39 are mounted on the rocker 35 at the left and at the right ends thereof, respectively, viewing Fig. 2.

In Fig. 1 the platen carriage is shown in what may be called its initial position, at rest, adjacent to the sheet feed table which is designated generally 40 and is intended to indicate any sort of table or support or other auxiliary part to facilitate the automatic or manual feeding of paper sheets to the machine. The carriage is provided with a handle 25' to facilitate the operation thereof and in its forward movement across printing position from the position shown in Fig. 1 an address printing device is fed forward from the magazine to the position indicated in broken lines in Fig. 1 and a sheet is carried by the carriage into printing position above the ribbon

which is stretched across the printing forms (and is shown only in Fig. 2). During this forward movement of the carriage the platen is held elevated out of operative position so that it will not engage the ribbon over which it travels. If an address printing device to be printed and a sheet to receive the impression have been properly disposed in printing position the platen will be lowered for the return movement of the carriage to initial position so that it will operatively engage the sheet and cause an impression to be made thereon through the ribbon. This movement of the platen between operative and inoperative positions is fully described in my application aforesaid and need only be referred to herein sufficiently to indicate the co-operation of the platen with the invention. As the carriage reaches the limit of its forward movement with the platen in elevated position the dog 38 will engage pin 41 (Fig. 1) which causes the rocker 35 to rock and push the rollers 30 forward and the platen roller down into printing position. On the return movement of the carriage dog 39 will engage pin 42 which returns the rocker shaft to normal position and restores the platen to elevated position. The engagement of dog 39 with pin 42 on the return movement of the carriage effects the operation thus described to elevate the platen out of printing position and as this movement takes place the spring 32 operates to throw the parts into the position shown in Fig. 4.

The paper feed comprises a ledge 43 which is rigidly mounted on the platen carriage, and one or more grippers which are arranged to engage the sheet upon the upper side of the ledge to carry it into printing position as the carriage moves forward. Means are provided for releasing the grippers at the proper time on the forward movement of the carriage but they form no part of the present invention and are not shown. One gripper 44 (Fig. 8) is loosely mounted on a shaft 45 which also carries an arm 46 rigidly mounted on shaft 45 and provided with a recess which forms a housing for the spring 47 engaging the gripper 44. The other gripper 48 is also rigidly mounted on the shaft 45 and it is provided with fingers 48' which are adapted to pass down through slots 43' provided for them in the ledge 43 (Fig. 7). A spring 49 is fastened to the platen carriage and to the shaft 45 to cause the grippers to make gripping engagement with the sheet on the ledge. If there is no sheet in position on the ledge the gripper fingers 48' may pass down through the slots 43' as indicated in broken lines in Fig. 6 but the gripper 44 remains on the ledge as shown in broken lines in this figure. When a sheet is positioned on the ledge the gripper fingers 48' will remain

on the sheet as well as the gripper 44 and the two grippers will hold the sheet until it has been arranged in printing position. Since the gripper 48 must be permitted a greater range of movement than the gripper 44 and as the gripper 48 is rigid on the shaft 45 the gripper 44 is arranged loosely on the shaft and operative movement is imparted thereto through the medium of the arm 46 and spring 47. Thus the arm 46 being rigid on the shaft has a greater range of movement than the gripper 44 but this difference in the range of movement of the arm 46 and the gripper 44 as well as the difference in the range of movement between the gripper 44 and the gripper 48 is provided for by the spring 47 interposed between the arm 46 and the gripper 44.

If for any reason a sheet is not positioned on the ledge in the initial position of the carriage the grippers will be disposed substantially as shown in Fig. 4, and, as heretofore pointed out, it is desirable to prevent the platen roller from being lowered into operative position and also to prevent feeding unprinted through the machine an address printing device which it is desired to print. To accomplish this I provide a tripper 50 which is rigidly mounted at one end on the shaft 45 (Fig. 6). This tripper is prevented from swinging down and the rocking movement in one direction of the shaft 45 is limited by the engagement of the gripper 48 with the sheet on the ledge. Assuming that the tripper has been swung to its lower position because of the absence of a sheet from the ledge (Fig. 6) and the carriage is moved forward from its initial position, the lug 51 on the tripper will engage the upper end of a rod 52 and push it to the left, Fig. 6, until the support 53 rigidly secured on said rod is dislodged from the block 54 which it engages to support the rod in normal position. In this movement of the block 53 it engages a rocker 55 which is pivotally mounted at 56 on the frame. The lower end of this rocker engages a stop 57 on a rod 58 which is slidably supported in the frame and is connected to a rocker 59 (Fig. 1^a) pivotally mounted at 59' on the frame of the machine. The rocker 59 is connected by a rod 60 (Fig. 7) to a bell crank 61 which is pivoted on the frame at 61' and operates a rod 62 which carries the pin 41. A socket 41' is provided in the frame 9 of the machine to constitute a guide for the pin 41 in its movement to and from operative position in the path of the dog 38. Thus it will be seen that if there is no sheet on the ledge to support the tripper the latter will, on the forward movement of the carriage, engage the rod 52 and through the intermediate connection thus described the pin 41 will be withdrawn from the path of the dog 38 and the platen roller will not

be thrown down to operative position it being recalled that it is the engagement of the dog 38 with pin 41 which causes the platen roller to be lowered from its elevated inoperative position to its operative position at or about the completion of the forward movement of the carriage. Therefore, on the return movement of the carriage the platen will not engage the ribbon. But when a sheet is properly positioned on the ledge the grippers 44 and 48 engaging the sheet will prevent the shaft 45 from rocking to the limit of its movement and will hold the tripper 50 sufficiently elevated to cause the lug 51 to clear rod 52 on the forward movement of the carriage.

On the return movement of the carriage a pin 63 on the tripper (Fig. 6) rides up on an inturned edge 64 of the switch pawl 65 which is pivotally mounted at 65' on a plate 66 which is adjustably mounted on the frame 9 of the machine. As the pin rides up on the edge 64 the tripper is lifted to elevated position to clear the rod 52 at the completion of the return stroke. When the tripper is thus swung upward it rocks the shaft 45 and opens the grippers 44 and 48 to receive a sheet as the carriage completes its return stroke. But the parts are so adjusted and arranged that the pin 63 will ride off of the edge 64 of the switch pawl as the return stroke is completed and the tripper will then swing downward to the position shown in Fig. 6 engaging the grippers with a sheet on the ledge, if a sheet has been so positioned, or with the gripper 44 resting on the ledge and the gripper 48 in lowered position as shown in Fig. 6, if no sheet is positioned on the ledge. Fig. 5 shows the tripper riding up on the switch pawl and Fig. 6 shows the tripper in lowered position after the pin 63 has passed beyond the edge 64 of the switch pawl upon which it rides. On the forward movement of the carriage the pin 63 rides under and lifts the switch pawl until it travels beyond the switch pawl, whereupon the latter drops by gravity to the position shown in Fig. 6, being limited in this movement by the stop 67.

To prevent an address printing device from being fed unprinted through the machine because a sheet was not properly positioned for printing during a cycle of operation of the platen carriage I pivotally connect the lower end of rod 52 to a rocker 68 (Fig. 2) which is pivoted on the frame at 68'. A pawl 69 on rocker 23 is normally engaged with a block 69' on the rocker 20 so that oscillating movement from the arm 22 is communicated to the arm 19 to reciprocate the address printing device carrier slide. When the block 53 is dislodged from block 54, as previously described, the rod 52 drops by gravity, swinging the rocker 68 on its pivot (or a spring may be provided to posi-

tively insure such movement), and when the rocker 23 then moves to the right, Fig. 2, carrying with it the pawl 69 which is pivoted thereon, a pin 69'' on said pawl rides up on the elevated end of the rocker 68 and disengages the pawl from the block 69' on rocker 20. This will take place when the arm 19 is in the position shown in broken lines in Fig. 2, and in this position of the arm 19 the carrier slide is in forward position delivering an address printing device to the anvil 12. In this way the address printing device which was to print on the sheet which should have been carried into printing position is thus held in place on the anvil during that cycle of operation of the platen carriage in which no sheet is arranged in printing position, and the carrier slide will remain in this position until a sheet is grasped by the grippers. But it is desirable to restore the safety rod 52 to its normal elevated position on the return stroke of the platen carriage and this is accomplished by the roller 70 which is carried by a link 71 pivoted at 71' on the rocker 23 (Fig. 2). When this rocker moves to the left, in Fig. 2, the roller 70 travels over and slightly beyond the rocker 68; then on the return movement of the rocker 23 the roller 70 engages the end of the rocker 68 and, being prevented from swinging on the rocker 23 by the pin 72, the roller causes the rocker 68 to swing and return to its normal position as shown in Fig. 2. But, as before stated, the arm 19 and the rocker 20 will remain in the broken line position shown in Fig. 2 and if no sheet is held by the grippers on the next forward movement of the platen carriage, the safety rod 52 will again be dislodged from its elevated position and the rocker 68 will be swung again and this time prevent the pawl 69 from engaging the block 69' on rocker 20. A spring 73 is connected to the rod 58 and to the frame of the machine, and pulls the rod to the left, Figs. 3, 6, which swings the rocker 55 (Fig. 6) and pushes against the block 53 to restore it to its position, resting upon block 54 when the safety rod 52 is lifted by the swinging of the rocker 68 (Fig. 2) as just described.

Printing and addressing machines may be provided with safety devices as heretofore described without an automatic selector but it is believed that most machines of this kind will also be provided with automatic means for selecting those address printing devices which are to be printed and skipping those which are not to be printed. A particular form of automatic selector is illustrated in a companion application Serial No. 383,615 filed May 24, 1920, and sufficient of this mechanism is illustrated in this application to show the general combination and co-operation of the parts.

A selector slide 74 is arranged to slide

in the frame of the machine within the carrier slide 17 and it is provided with a pair of pawls 75 which are pivotally mounted between their ends at 76 on the selector slide.

5 A spring 77 is attached to each pawl and to the frame and normally holds the pawl in operative position as shown in Fig. 2 to engage the front edge of the lowermost printing device 15 in the magazine on the return

10 movement of the carrier slide. This movement of the selector slide in engagement with the printing device is only sufficient to cause the tab 15' on the printing device to engage the selector pin 78 on the selector frame 79

15 and swing said frame on its pivot 79'. When the selector frame is thus swung (to the left, Fig. 2) the block 80 on the lower end of arm 81 carried by the selector frame is disengaged from the block 82 on the

20 rocker 83 pivoted at 83' on the machine frame (Fig. 3). A link 84 is pivotally connected at one end to a pin 84' on the rocker 83 and at its other end to one arm 85 of a rocker 85' which is pivotally mounted in the

25 frame. A spring 86 is fastened at one end of the machine frame and at its other end to a projection 86' from the upper end of the link 84. A rod 87 is pivotally connected to the other arm 88 of the rocker 85' and is

30 guided in the frame of the machine and has its upper end arranged to engage a flange 89 formed by bending over an edge of the tripper 50. The cross bar 79'' on the selector frame is provided with a plurality of

35 openings in which the selector pin may be arranged to select for skipping those address printing devices provided with tabs which will engage the pin. At the completion of the return stroke of the platen carriage the

40 lowermost printing device in the stack has been pushed backward, as shown in Fig. 2, and if this printing device is to be skipped its tab will have engaged the selector pin and swung the selector frame and disengaged block 80 from block 82, and spring 86

45 will have swung rocker 83 and rocker 85' and moved rod 87 upward, lifted tripper 50 and rocked gripper shaft 45 and swung the grippers 43 and 48 into the open position shown in Fig. 5. Thus the machine is set to

50 prevent the grippers from carrying a sheet into printing position on the next forward movement of the platen carriage, but the printing device feeding means will operate

55 in the usual way and feed the printing device which operated the selector as just described through the machine without printing.

60 An arm 90 is provided on the rocker 85' (Fig. 6) and engages the stop 57 to shift the rod 58 and withdraw the pin 41 from the path of the dog 38 during the preceding skipping operation of the selector mechanism so that the platen roller will be held

65 out of operative position on the return move-

ment of the platen carriage during which the printing device to be skipped is resting on the anvil.

An arm 91 is provided on the rocker 85' (Fig. 3) projecting in a direction opposite 70 to the arm 85, and if the lower end of the link 84 is engaged with the outer end of the arm 91 the selector mechanism will be operated to print instead of to skip when the tab engages the selector pin and swings the 75 selector frame as previously described. When link 84 is engaged with arm 85 of the rocker 85' spring 86 will be tensioned to overcome the tension of spring 73, because these springs are then operating in opposition, 80 (as shown in the drawings); but when link 84 is engaged with arm 91 of rocker 85' the springs will then be operating in unison and accordingly the tension of spring 86 is reduced, this being accomplished by reason of 85 the fact that the spring 86 is connected to a fixed part of the machine frame at its lower end and to the arm 86' at its upper end. Since this arm 86' is rigid with the link 84 and the lower end of link 84 is swung to the 90 right Fig. 3 to be engaged with rocker arm 91 it will be readily observed that spring 86 is permitted to contract to reduce its tension.

Rod 92 is pivotally connected at its upper 95 end to an arm 93 on the rocker 83 (Figs. 2, 3) and at its lower end this rod carries a block 94 and is connected by a spring 95 to a bracket 96 mounted in fixed position on the shaft 21. A slotted arm 97 is rigid with the rocker 23 and forms a guide for the rod 100 92. When the rocker 23 swings to the right in Fig. 2 the arm 97 will swing with the rocker far enough to permit the spring 95 to pull the lower end of the rod 92 to the right and on the return movement of the 105 rocker 23, to the left in Fig. 2, the projection 98 on the arm will engage block 94 and depress rod 92 to swing rocker 83 on its pivot until the selector frame is swung back by spring 99 in operative engagement with block 110 82. Thus the parts are so arranged and timed that the selector mechanism will be reset by the operation of the resetting rod 92 in normal position sufficiently before the platen carriage reaches the end of its return movement to permit the selector slide 115 dogs to operate as previously described.

The selector mechanism is more fully described and is claimed in the companion application herein referred to and is set forth 120 herein to show the combination with the safety device. I have found in practical use that this selector mechanism operates satisfactorily for the purposes intended and for 125 this reason I now propose to use it in the complete machine, but it will be understood that other selector mechanisms may be used in the combination with the safety means within the purview of my invention.

A complete cycle of operation of the ma- 130

chine comprises a full forward movement of the platen carriage from the initial position shown in Fig. 1 and a full return movement of the platen carriage to initial position.

5 During this normal and complete cycle of the operation, the impression platen has an elevated and therefore non-impression position when traveling away from the sheet feed table 40, and thereafter it has a lower

10 and therefore an impression position on its return stroke and when traveling towards the sheet feed table. As the platen carriage approaches initial position the tripper is lifted by the switch pawl to rock the gripper

15 shaft and open the grippers, as indicated in Fig. 5, to receive the sheet which is, at this time, fed to the machine manually or mechanically. This opening of the grippers takes place just before the completion of the

20 return stroke of the platen carriage and while the pin 63 is riding on the switch pawl. When the pin rides off of the switch pawl the grippers close on the sheet which has been fed on to the ledge. This takes

25 place just as the platen carriage completes its return stroke and, therefore, in the initial position of the platen carriage under normal operation of the machine the grippers are gripping the edge of a sheet ready

30 to carry it into printing position. And at this time the platen roller is in elevated position, as shown in Figs. 4-6, and the selector pawls have moved the lowermost printing device in the stack, which is the

35 device next to be printed, backward as shown in Fig. 2. If this lowermost printing device is provided with a tab which will engage the selector pin set for skipping, the selector frame will, on the return movement of the

40 platen carriage, be swung outward, to the left in Fig. 2, and the block 80 disengaged from block 82 (Fig. 3) and the spring 86 will have operated the rockers 83 and 85' to lift rod 87 so that the tripper flange 89 will

45 engage therewith and be lifted thereby to rock the shaft and hold the grippers in open position as the platen carriage comes to rest at the end of its return stroke, as shown in Fig. 5. Therefore, if the printing device to

50 be fed to printing position on the next forward stroke of the platen carriage is to be skipped, the grippers will be held open, whether or not a sheet is fed into position on the ledge, so that the grippers will not

55 carry a sheet into printing position when no impression is to be taken. And in such case the platen roller will not be lowered into printing position at the end of the forward stroke of the platen carriage because when the selector mechanism operates as just described the arm 90 on the rocker

60 85' will shift the rod 58 to the right (Fig. 6) and through its connections with the pin 41 withdraw the pin from the path of the

65 dog 38. On the other hand, if the lower-

most printing device is to be printed in the next cycle of operation of the machine it will not operate the selector mechanism when it is pushed backward (to the left, Fig. 2) by the selector pawl at the end of the return stroke of the platen carriage and, consequently, the grippers will be closed on the sheet to carry the sheet into printing position as the printing device is carried into printing position on the forward movement

70 of the platen carriage.

75

My invention provides safety means of simple construction which operate automatically to insure a systematic operation of the machine and to take care of any failure

80 in the sheet feed as well as predetermined skipping in printing the address devices. If the machine is used for addressing only the invention will operate in the manner hereinbefore described, and the invention

85 may be applied to machines which are intended only for addressing purposes. I use the word "sheet", therefore, in connection with the invention in a broad sense to include envelopes, tags, letter sheets, etc., to

90 be printed.

As before stated, my invention is shown herein in a form which I have selected for embodiment in the printing and addressing

95 machine of the kind, but not necessarily of the particular construction, disclosed in my earlier application, Serial No. 123,233, but I do not wish to be understood as limiting the invention to the particular embodiment disclosed herein and I reserve the right to make

100 all such changes as fairly fall within the scope of the following claims.

I claim:

1. In a printing machine, the combination of a printing form, an impression roller,

105 one of said elements being movable relative to the other to obtain a printing impression, said roller having a non-impression position and also an impression position, means for feeding a sheet to be printed into printing

110 position, and safety means for preventing the roller from moving from its non-impression position into its impression position, if the feeding means does not feed a sheet to

115 printing position.

2. In a printing machine, the combination of a printing form, an impression platen, one of said elements being movable relatively to the other to obtain a printing impression, the platen having a non-impression position and also an impression position, means moving with the movable element for feeding a sheet to be printed into

120 printing position, and safety means for preventing the platen from moving from its non-impression position to its impression position, if the feeding means does not feed

125 a sheet to printing position.

3. In a printing machine, the combination of a printing form, an impression platen

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operating out of impression position on one stroke and in impression position on the other stroke, means for feeding a sheet to be printed into printing position during the stroke of the platen out of impression position, and safety means for holding the platen out of impression position on its other stroke if the feeding means does not feed a sheet to printing position.

4. In a printing machine, the combination of a printing form, a reciprocating impression platen operating out of impression position on one stroke and in impression position on the other stroke, means for feeding a sheet to be printed into printing position during that stroke of the platen out of impression position, and safety means for holding the platen out of impression position on its other stroke if the feeding means does not feed a sheet to printing position.

5. In a printing machine, the combination of a printing form, an impression platen having an impression position and a non-impression position, one of said elements being movable relatively to the other to obtain a printing impression, means for shifting the platen into position to make an impression, means separate from the platen for feeding a sheet to be printed into printing position, and means controlled by the feeding means for preventing the operation of said platen shifting means upon failure of the feeding means to feed a sheet.

6. In a printing machine, the combination of a printing form, a reciprocating impression platen operating in an upper plane above the form on one stroke and in a lower plane to make an impression from the form on the other stroke, means for shifting the platen from the upper plane to the impression plane, means for feeding a sheet to be printed into printing position during that stroke of the platen in its upper plane, and safety means adapted to be operated upon the failure of the feeding means to feed a sheet and thereby prevent the shifting means from operating.

7. In a printing machine, the combination of a printing form, an impression platen, means for shifting the platen to and from impression position, means for feeding a sheet to be printed into printing position, and safety means operated by the feeding means for preventing the operation of the shifting means.

8. In a printing machine, a printing form and an impression platen, means for bodily moving said platen towards said form to obtain a printing impression, means for feeding a sheet into printing position, and means preventing said bodily movement of said platen if said feeding means fails to feed a sheet into printing position.

9. In a printing machine, the combination of a printing form, an impression platen,

means for shifting the platen to and from impression position, means moving with the platen for feeding a sheet to be printed into printing position, and safety means operated by the feeding means in the absence of a sheet in the feeding means at the beginning of the feeding operation to prevent operation of the platen shifting means.

10. In a printing machine, the combination of a printing form, an impression platen, means for shifting the impression platen to and from impression position, means for feeding a sheet to be printed into printing position, and means comprising a tripper operated by the feeding means to prevent operation of the shifting means.

11. In a printing machine, the combination of a printing form, an impression platen, means for shifting the impression platen to and from impression position, and means for feeding a sheet to be printed into printing position, and means comprising a pivoted tripper held in inoperative position when a sheet is engaged with the feeding means and capable of swinging into operative position to prevent the operation of the shifting means when a sheet is not engaged with the feeding means.

12. In a printing machine, the combination of a printing form, an impression platen, means for shifting the platen to and from impression position, feeding means comprising members to engage a sheet to feed the sheet into printing position, a pivoted tripper adapted to be held in inoperative position when a sheet is engaged by said members and capable of swinging into operative position when a sheet is not engaged by said members, and means operated by said tripper for preventing the operation of the shifting means.

13. In a printing machine, the combination of a printing form, an impression platen, means for shifting the platen to and from impression position, means for feeding a sheet to be printed into printing position and comprising a relatively fixed member and a movable member, a pivoted tripper held in inoperative position when a sheet is engaged by said members and capable of swinging into operative position when a sheet is not engaged by said member, and means operated by said tripper for preventing operation of the shifting means.

14. In a printing machine, the combination of a printing form, an impression platen, means for shifting the platen to and from impression position, means for moving with the platen for feeding a sheet to be printed into printing position and comprising a relatively fixed member and a movable member to engage the sheet, a pivoted tripper fixed with relation to the platen and held in inoperative position when a sheet is engaged by said members and capable of

swinging into operative position when a sheet is not engaged by said members, and means operated by the tripper for preventing the operation of the shifting means.

15. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for preventing operation of the shifting means and comprising a pivoted tripper, means for feeding a sheet to be printed into printing position and comprising a ledge adapted to receive the sheet thereon, and a finger pivoted on the tripper pivot and adapted to engage a sheet on the ledge, said finger sustaining the tripper in inoperative position when the finger engages a sheet and permitting the tripper to swing to operative position when the finger does not engage a sheet, and means adapted to be operated by the tripper for preventing the operation of the shifting means.

16. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, a pivoted tripper, means for feeding a sheet to be printed into printing position and comprising a member adapted to receive a sheet thereon and having a slot, a finger pivoted on the tripper pivot and adapted to engage the sheet on said member and hold the tripper in inoperative position, or to engage said slot and permit the tripper to swing into operative position in the absence of a sheet on the member, and means adapted to be operated by said tripper for preventing the operation of the shifting means.

17. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, a rock shaft movable with the platen, a tripper mounted on said shaft, means for feeding a sheet to be printed into printing position and comprising a relatively fixed member adapted to receive a sheet thereon and having a slot therein, and a finger rigid on said shaft and adapted to engage the sheet on the member and hold the tripper in inoperative position or to engage said slot and permit the tripper to swing into operative position in the absence of a sheet on said member, and means adapted to be operated by said tripper to prevent the operation of said shifting means.

18. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for feeding a sheet to be printed into printing position and comprising a relatively fixed member adapted to receive a sheet thereon and having a slot therein, a pair of movable grippers adapted to engage a sheet

on said member, one of said grippers being adapted to engage said slot in the absence of a sheet on the member and having a greater range of movement than the other gripper, and means adapted to be operated by the feeding means to prevent the operation of the shifting means.

19. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, a rock shaft, a tripper mounted on said shaft, means for feeding the sheet to be printed into printing position and comprising a relatively fixed member adapted to receive a sheet thereon and having a slot therein, a gripper loosely mounted on said shaft, yielding means rigidly mounted on the shaft for operating said gripper, another gripper rigidly mounted on said shaft and adapted to engage a sheet on said member to hold the tripper in inoperative position and to engage said slot in the absence of a sheet on the member and permit the tripper to swing into operative position, and means adapted to be operated by the tripper to prevent the operation of the shifting means.

20. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for feeding a sheet to be printed into printing position and comprising a relatively fixed member adapted to receive a sheet thereon and having a slot therein, a gripper adapted to engage a sheet on said member or to engage said slot in the absence of a sheet on the member, a tripper for moving said gripper to open position, and a latch for operating said tripper.

21. In a printing machine, the combination of a printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, feeding means traveling with the platen for feeding a sheet to be printed into printing position and comprising a movable gripper, a tripper for moving said gripper to open position, a latch device for operating said tripper, and means adapted to be operated by the tripper when the gripper does not engage a sheet to prevent the operation of said shifting means.

22. In a printing machine, the combination of a frame, a printing form, a reciprocating platen carriage, a platen, means for shifting the platen into impression position comprising a dog, a pin on the frame located in the path of the dog to operate said platen shifting means, means moving with the platen to feed a sheet to be printed into printing position, and means operated by the feeding means to withdraw said pin from the path of the dog to prevent the operation of the platen shifting means.

23. In a printing machine, the combination of a plurality of printing devices and an impression platen, means for feeding said printing devices one at a time into printing position, means for feeding a sheet to be printed into printing position, and means operated by the sheet feeding means for preventing the feeding of a printing device when the sheet feed fails to feed a sheet.

24. In a printing machine, the combination of a printing form and an impression platen, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, and means operated by the sheet feeding means for preventing the feed of an address form when the sheet feed fails to feed a sheet.

25. In a printing machine, the combination of a printing form and an impression platen, means for feeding address printing forms one at a time into printing position and comprising a lever arm, means for operating said lever arm, means for feeding a sheet to be printed into printing position, and means for disconnecting said lever arm and its operating means to halt the address form feed when the sheet feed fails to feed a sheet.

26. In a printing machine, the combination of a printing form and an impression platen, means for feeding address printing forms one at a time into printing position and comprising a lever arm, means for operating said lever arm, means for feeding a sheet to be printed into printing position, and means operated by the sheet feeding means for disconnecting said lever arm and its operating means and preventing the feed of an address form when the sheet feed fails to feed a sheet.

27. In a printing machine, the combination of a stationary printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, and means for preventing the platen shifting means and the address form feeding means from operating when the sheet feeding means fails to feed a sheet.

28. In a printing machine, the combination of a stationary printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, and means operated by the sheet feeding means for preventing the platen shifting means and the address form feeding means from operating when the sheet feeding means fails to feed a sheet.

29. In a printing machine, the combination of a printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, means for selecting certain forms to be skipped, and means for preventing the operation of the platen shifting means when the address form feed is feeding a form to be skipped.

30. In a printing machine, the combination of a printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, means for selecting certain forms to be skipped, and means for preventing the paper feed from feeding a sheet and the platen shifting means from operating when the address form feed is feeding a form to be skipped.

31. In a printing machine, the combination of a printing form and a movable impression platen, means for feeding address printing forms one at a time into printing position, means for selecting certain address forms to be skipped, and means operated by the selector means for preventing the paper feed from feeding a sheet and the platen shifting means from operating when the address form feed is feeding a form to be skipped.

32. In a printing machine, the combination of a printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, means for selecting certain forms to be skipped, and means operated by the selector means for preventing the operation of the platen shifting means when the address form feed is feeding a form to be skipped.

33. In a printing machine, the combination of a printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position, means for selecting certain forms to be skipped, and means operated by the selector means for preventing the paper feed from feeding a sheet and the platen shifting means from operating when the address form feed is feeding a form to be skipped.

34. In a printing machine, the combination of a printing form and a movable im-

pression platen, means for feeding address printing forms one at a time into printing position, means for feeding a sheet to be printed into printing position and comprising a gripper to engage the sheet, and means for holding said gripper inoperative when the address form feed fails to feed an address form.

35. In a printing machine, the combination of a printing form and a movable impression platen, means for feeding address printing forms one at a time into printing position, means for selecting certain address forms to be skipped, means for feeding a sheet to be printed into printing position and comprising a gripper to engage the sheet, and means for holding said gripper inoperative when the address form feed is feeding an address form to be skipped.

36. In a printing machine, the combination of a printing form and a movable impression platen, means for shifting the platen to and from impression position, means for feeding address forms one at a time into printing position, means for selecting certain address forms to be skipped, means for feeding a sheet to be printed into printing position and comprising a gripper to engage the sheet and adapted to operate the platen shifting means, and means for holding said gripper inoperative when the address form feed fails to feed an address form or when it is feeding a form to be skipped.

37. In a printing machine, the combination of a stationary printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for feeding changeable printing forms one at a time into printing position, means for selecting certain of said changeable forms to be skipped and others to be printed, and means operated by said selector means to prevent the platen from being shifted into printing position when the changeable printing form in printing position is to be skipped.

38. In a printing machine, the combination of a stationary printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for feeding changeable printing forms one at a time into printing position, means for selecting certain of said changeable forms to be skipped and others to be printed, means connecting said selec-

tor means with said platen shifting means to prevent the platen from being shifted into printing position when the changeable printing form in printing position is to be skipped, said connecting means comprising a rocker adapted to be operated by the selector means and adapted to control the operation of the platen shifting means.

39. In a printing machine, the combination of a stationary printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for feeding changeable printing forms one at a time into printing position, means for selecting certain of said changeable forms to be skipped and others to be printed, means connecting said selector means with said platen shifting means to prevent the platen from being shifted into printing position when the changeable printing form in printing position is to be skipped, said connecting means comprising a rocker having oppositely disposed arms, and a link adapted to be connected with one or the other of said arms to control the operation of the platen shifting means.

40. In a printing machine, the combination of a stationary printing form and a relatively movable impression platen, means for shifting the platen to and from impression position, means for feeding changeable printing forms one at a time into printing position, means for selecting certain of said changeable forms to be skipped and others to be printed, means connecting said selector means with said platen shifting means to prevent the platen from being shifted into printing position when the changeable printing form in printing position is to be skipped, said connecting means comprising a rocker, and an arm normally engaging said rocker and adapted to be disengaged through the medium of a changeable printing form, to control the operation of said platen shifting means.

41. In a printing machine, a printing form, an impression platen having movement in two planes, movement in one of said planes bringing said platen into impression position, means for feeding a sheet into printing position and means preventing said movement of the platen into impression position if said feeding means fails to feed a sheet into printing position.

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