

Aug. 20, 1946.

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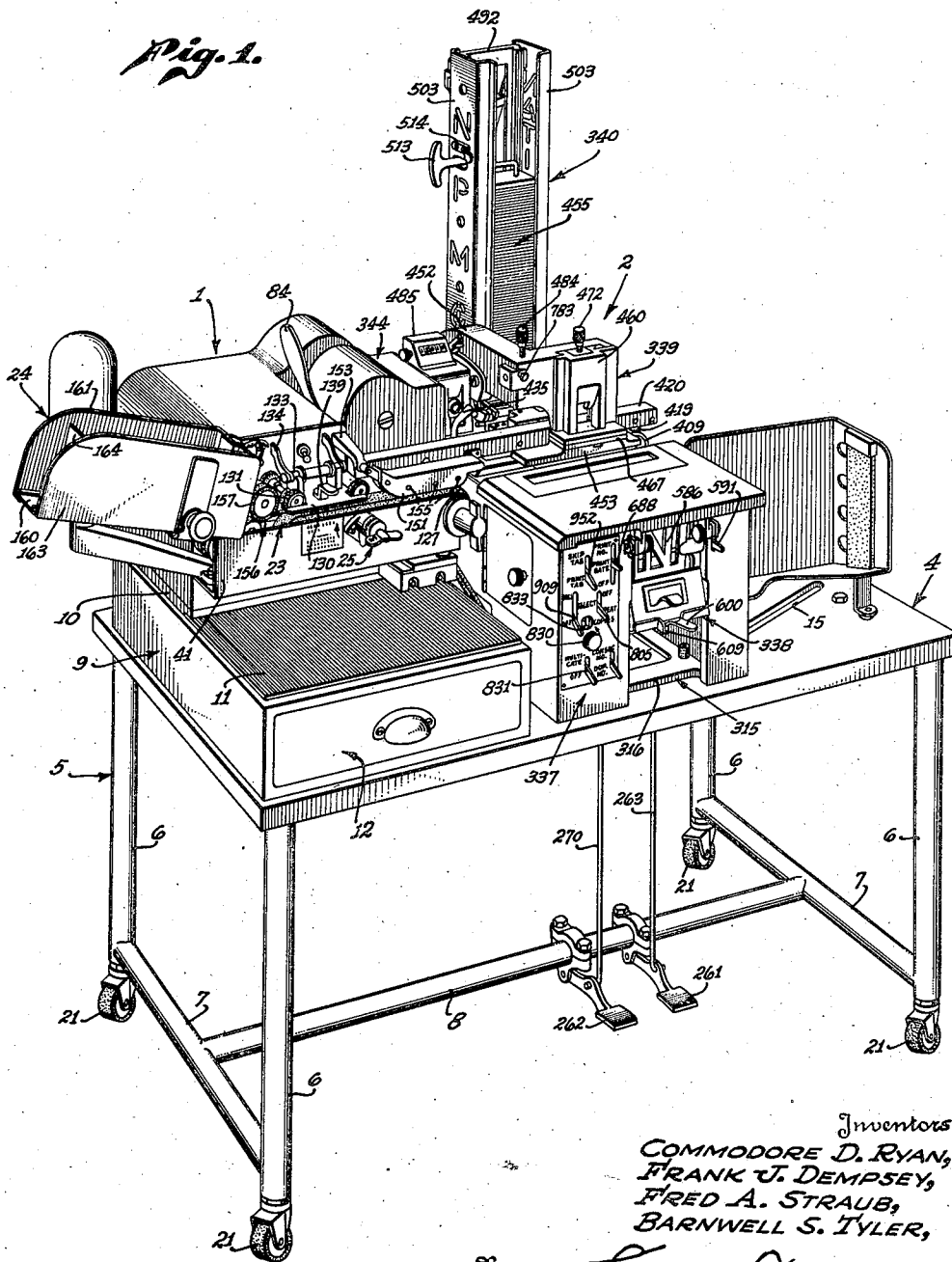
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Fig. 1.



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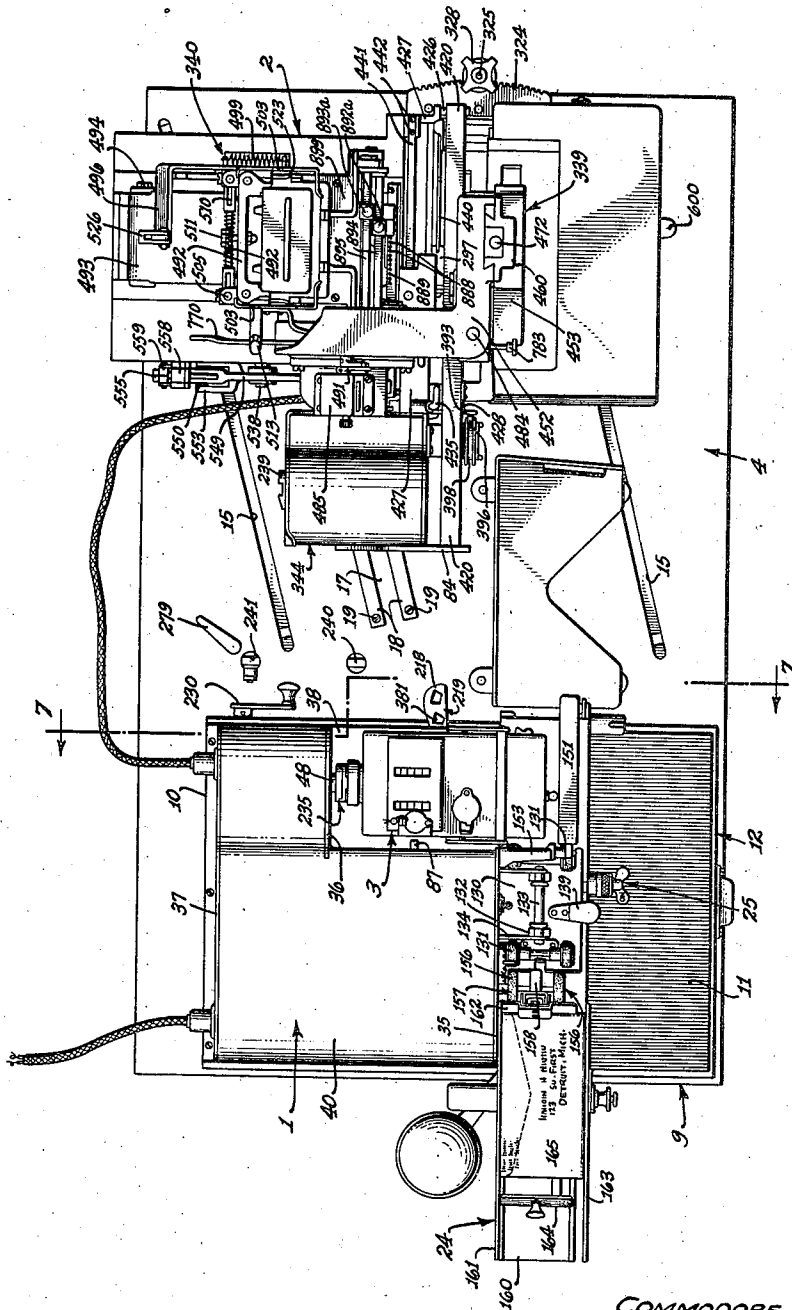


Fig. 2.

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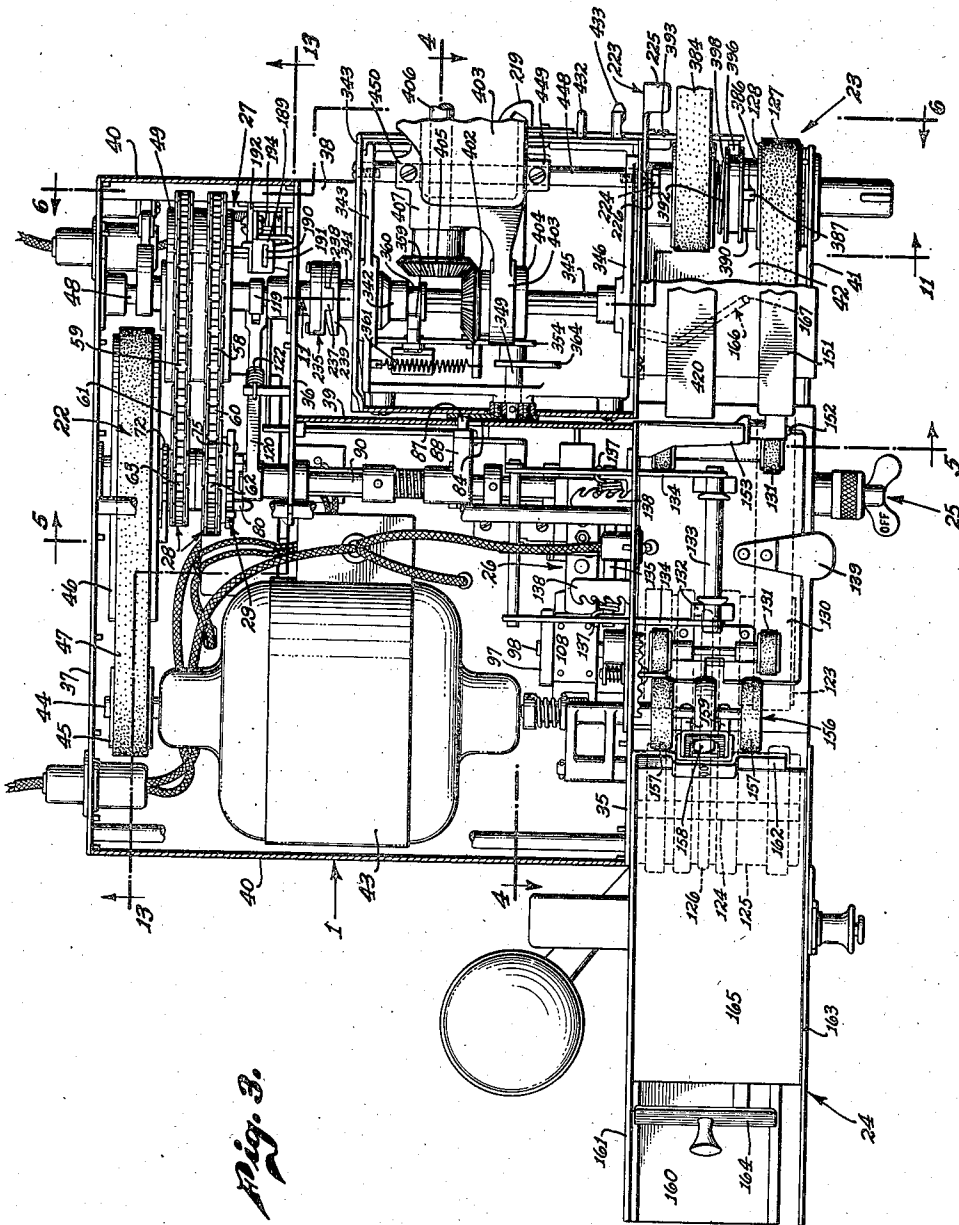


Fig. 3.

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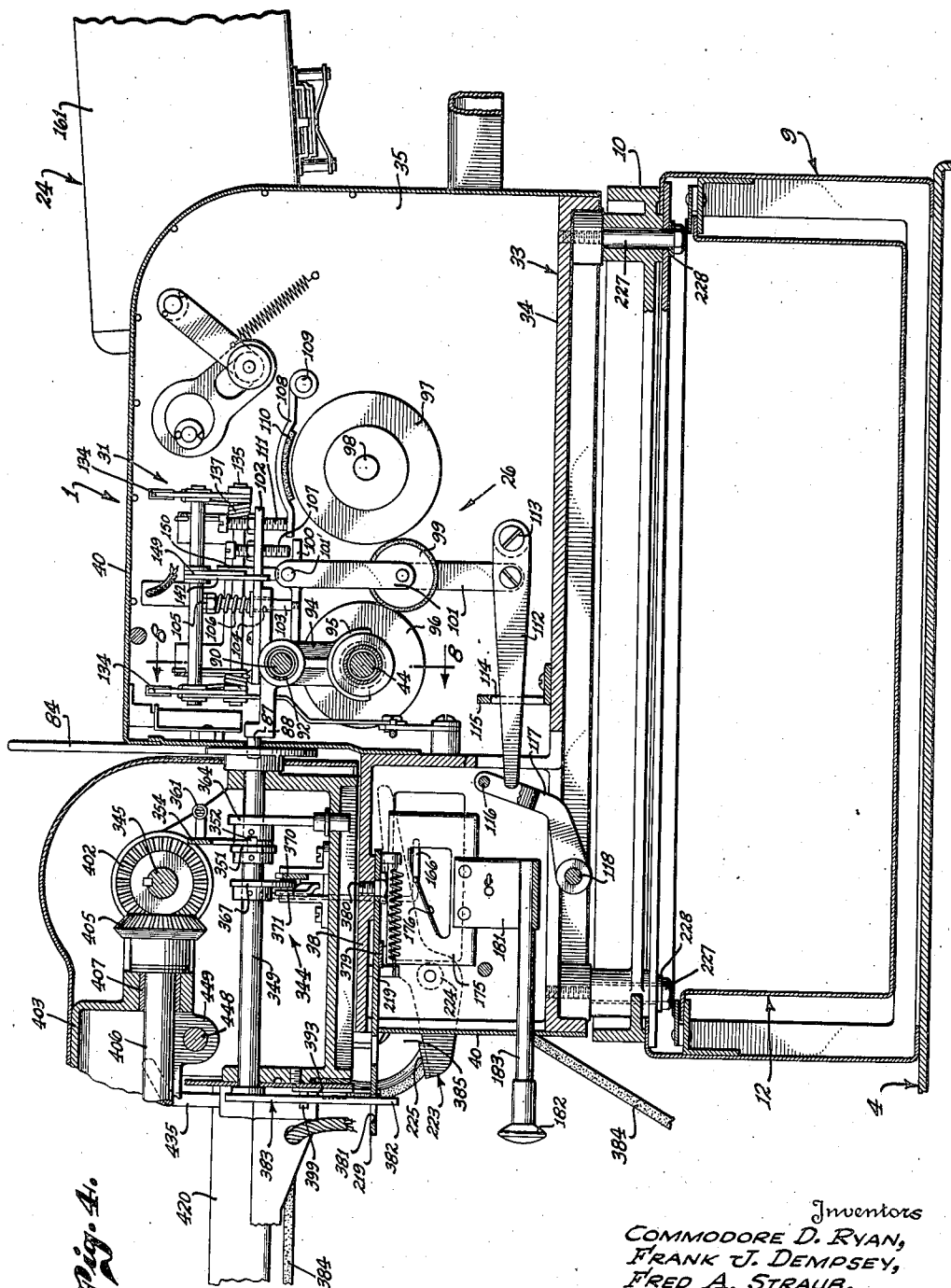


Fig. 4.

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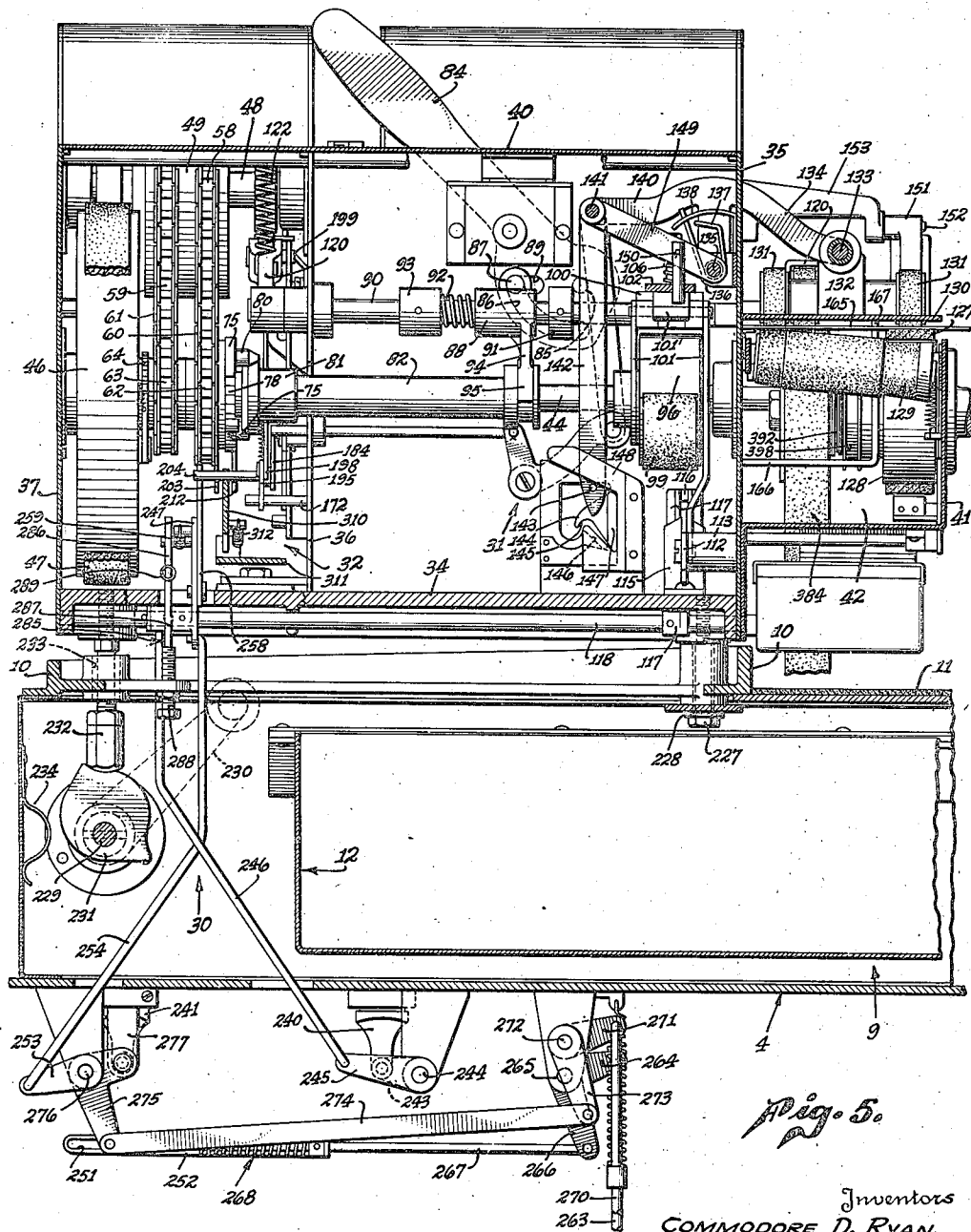


Fig. 5.

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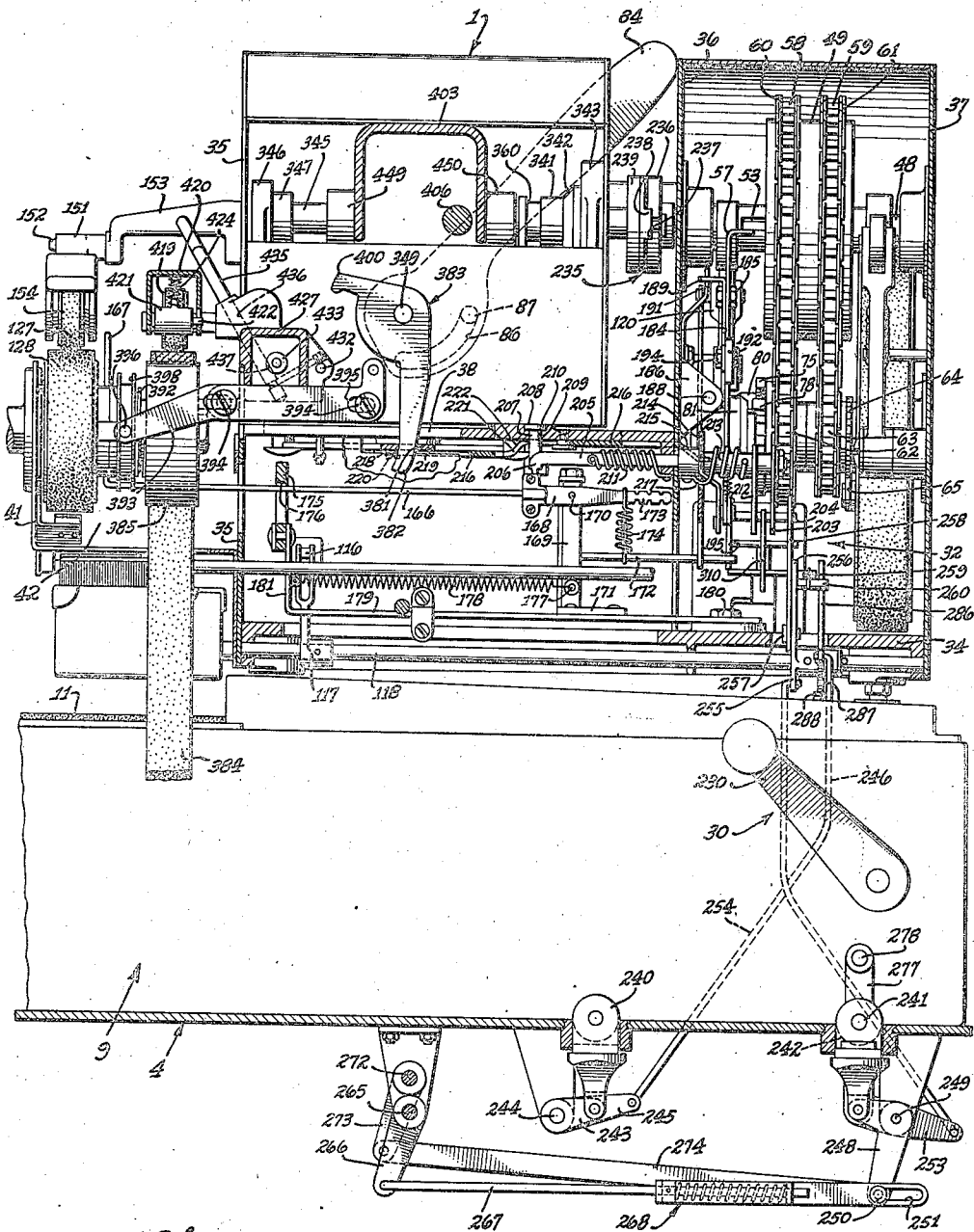


Fig. 6.

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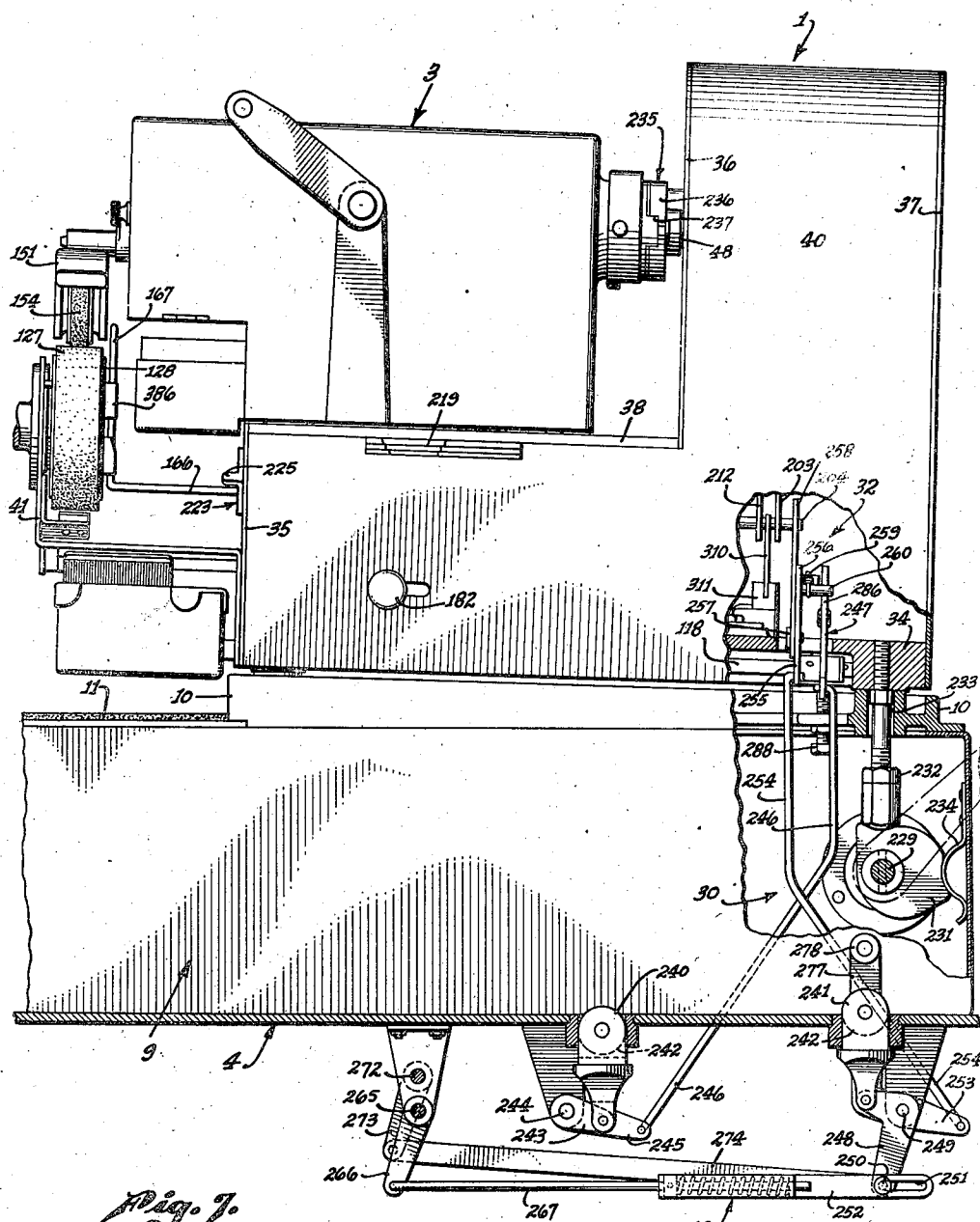


Fig. 7.

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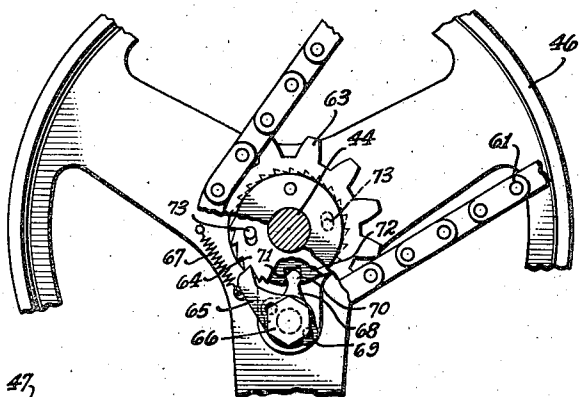


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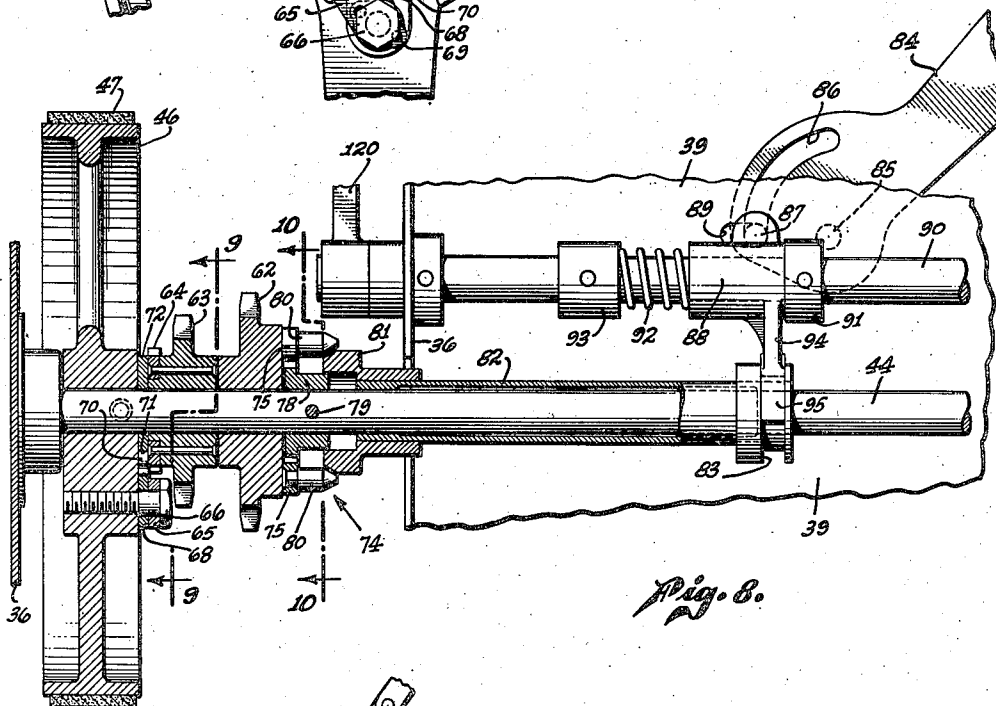


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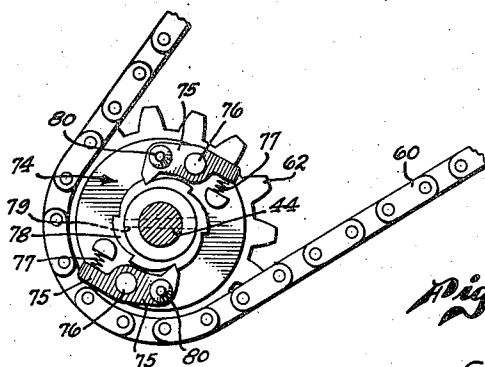


Fig. 10.

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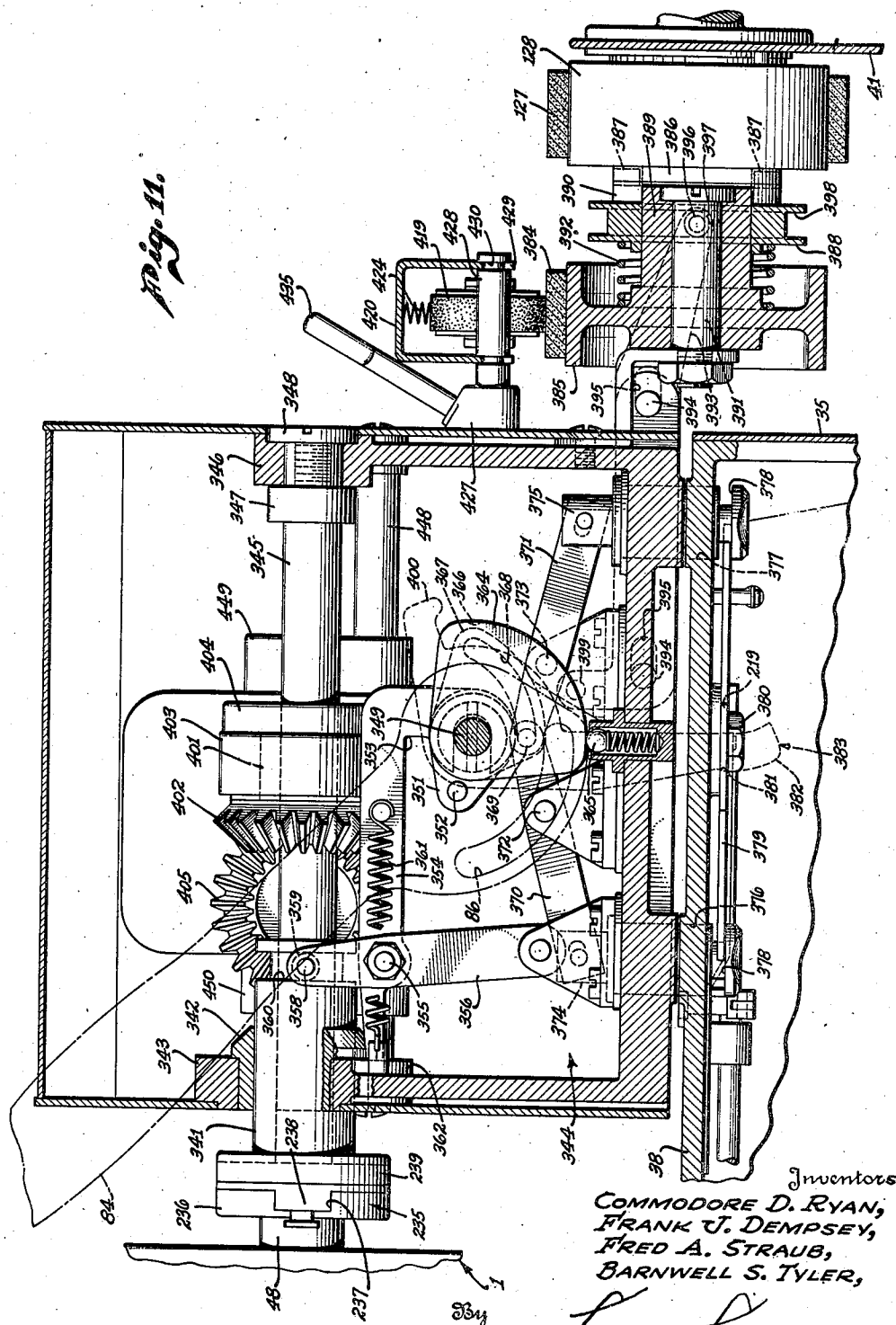
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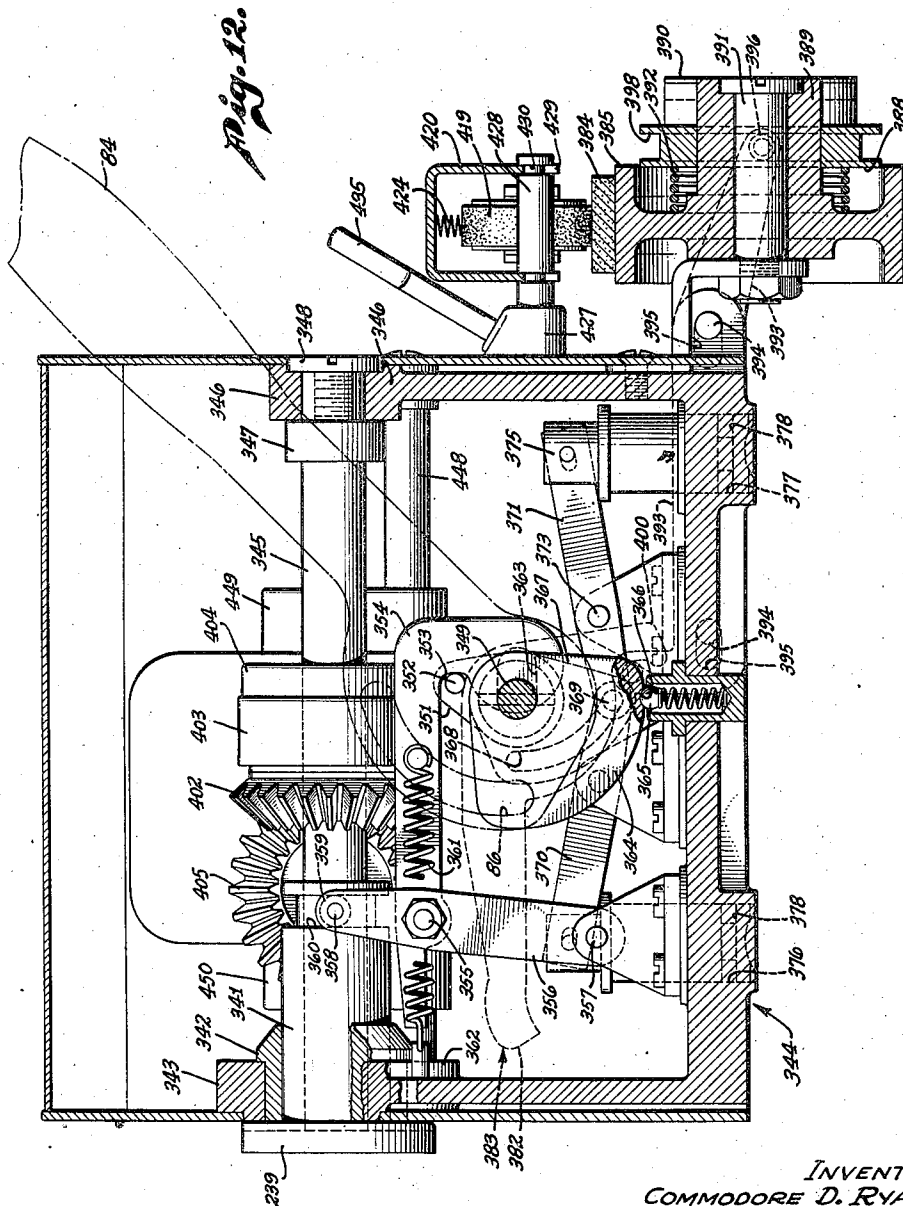
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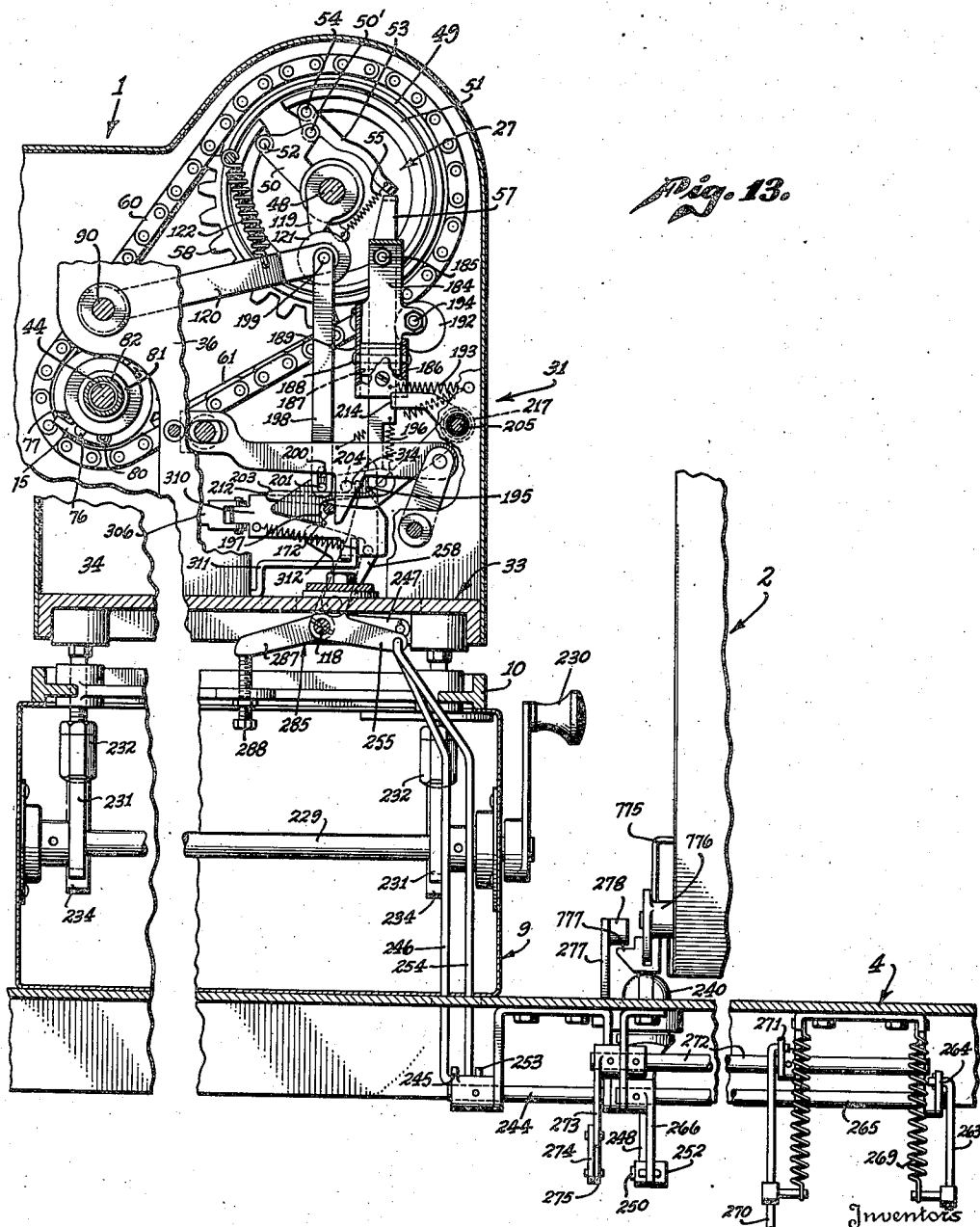


Fig. 13.

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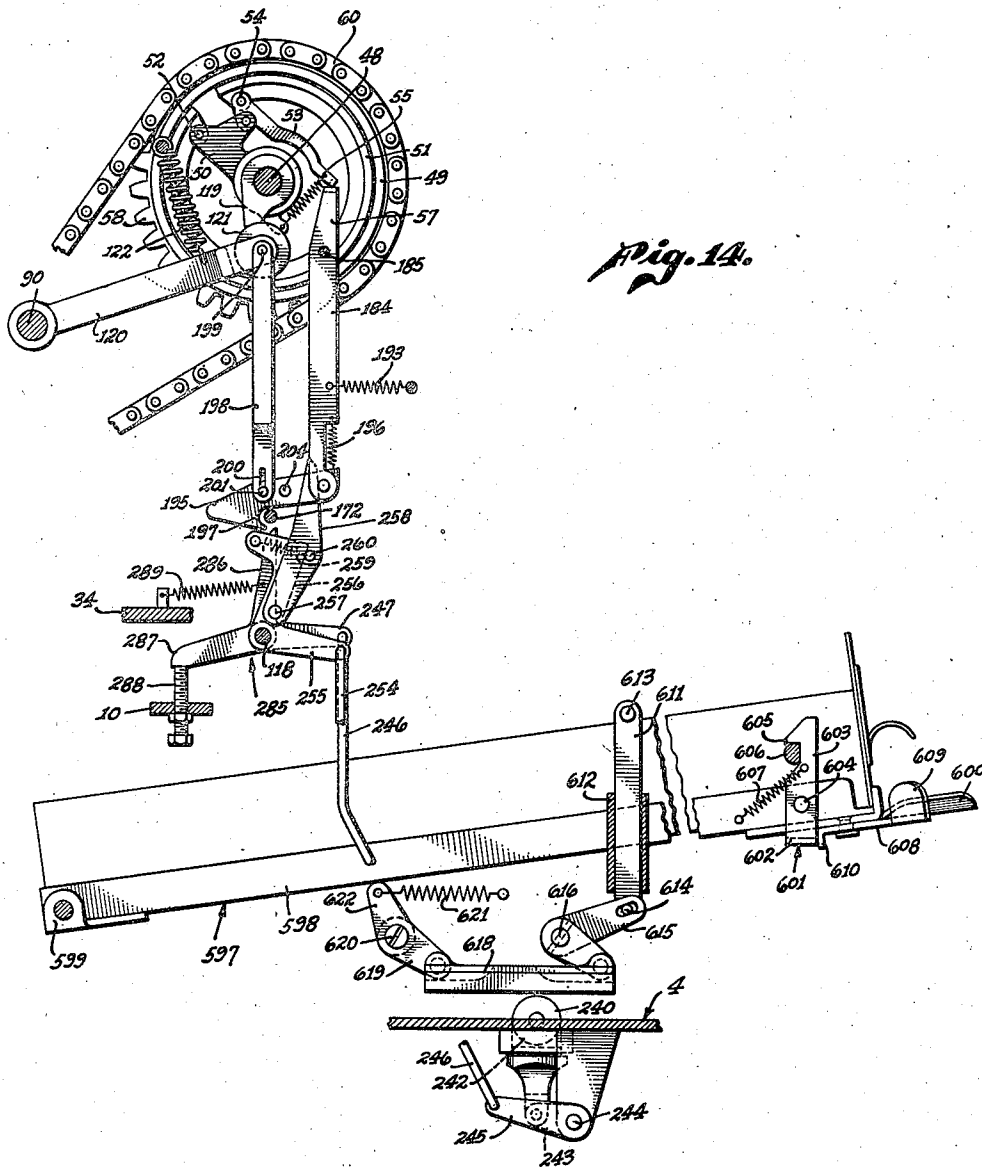
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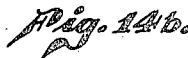


Fig. 14a.

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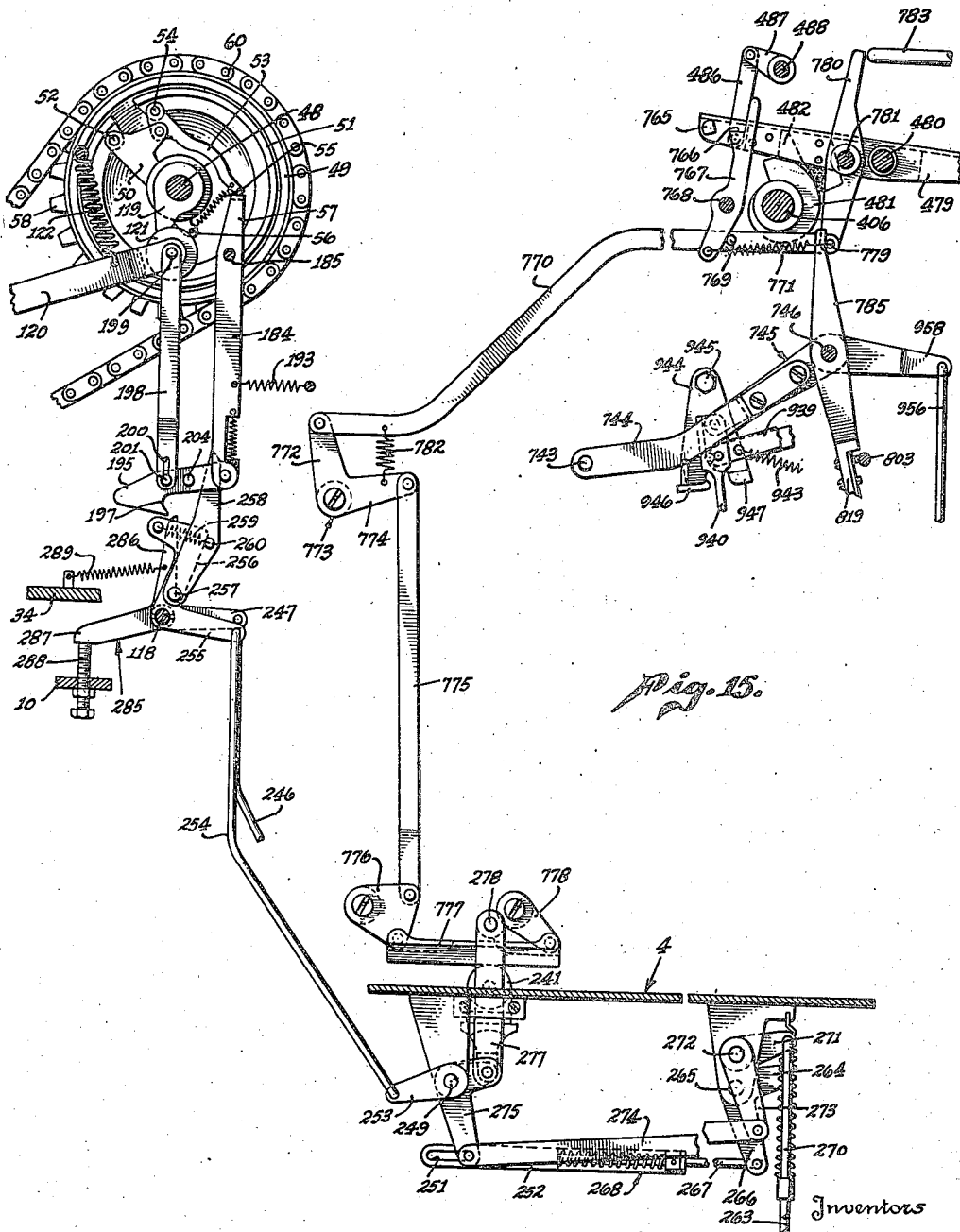


Fig. 15.

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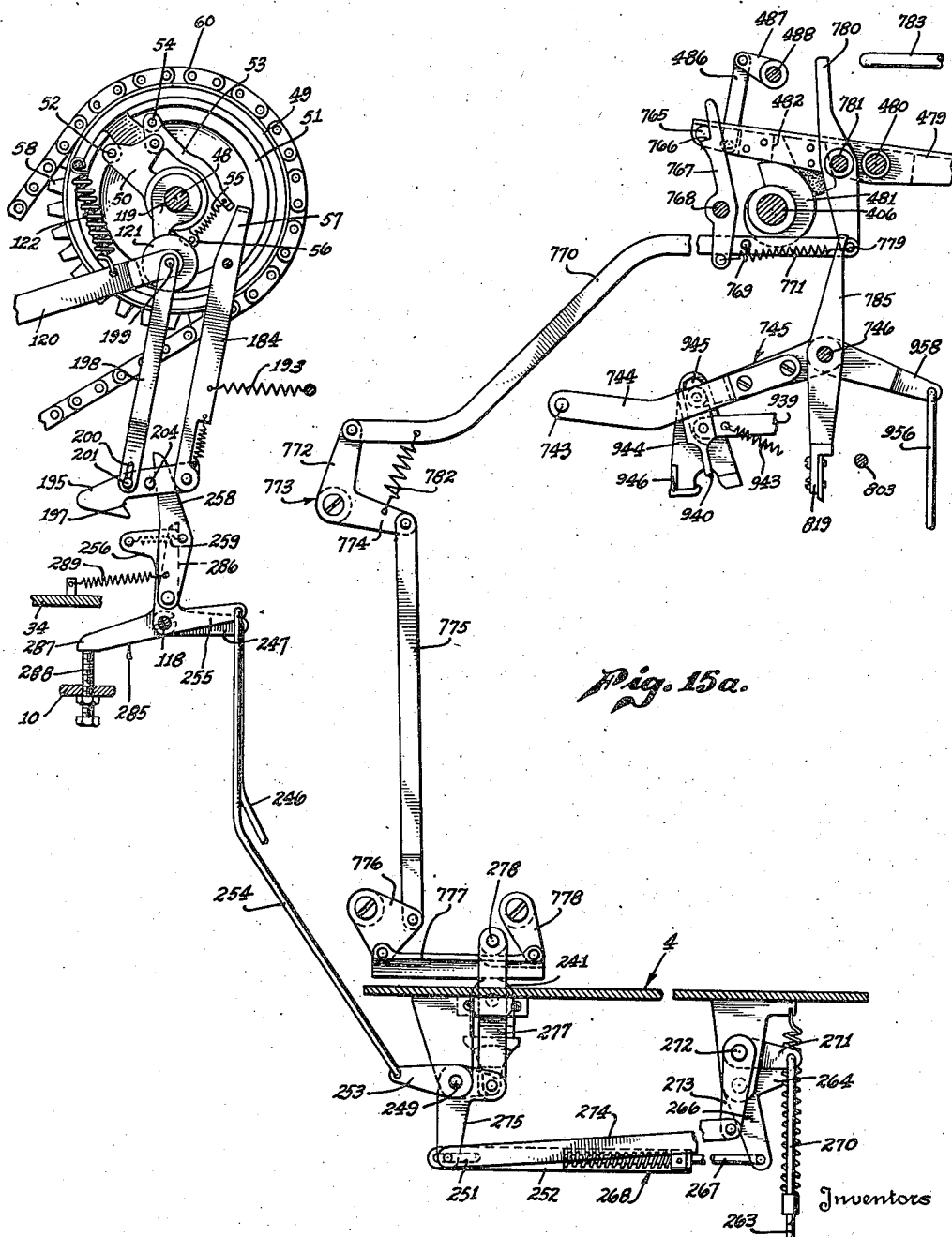


Fig. 15a.

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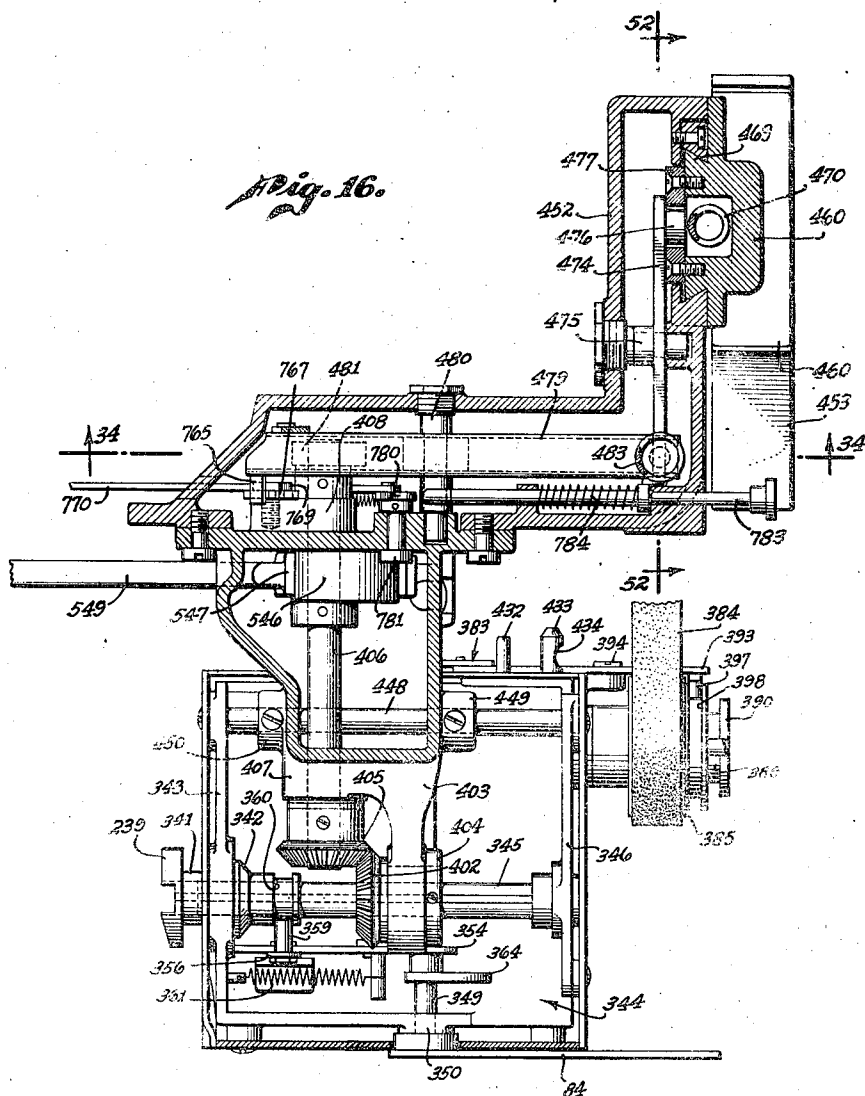
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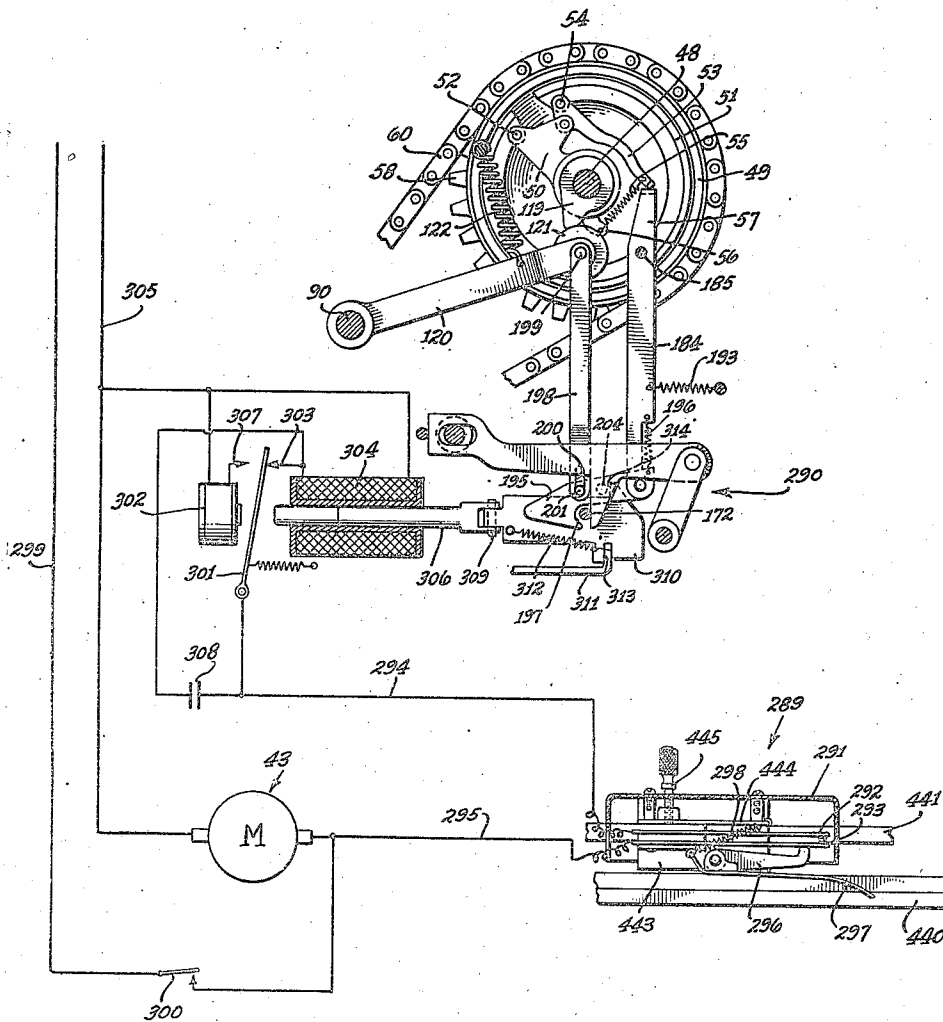


Fig. 17.

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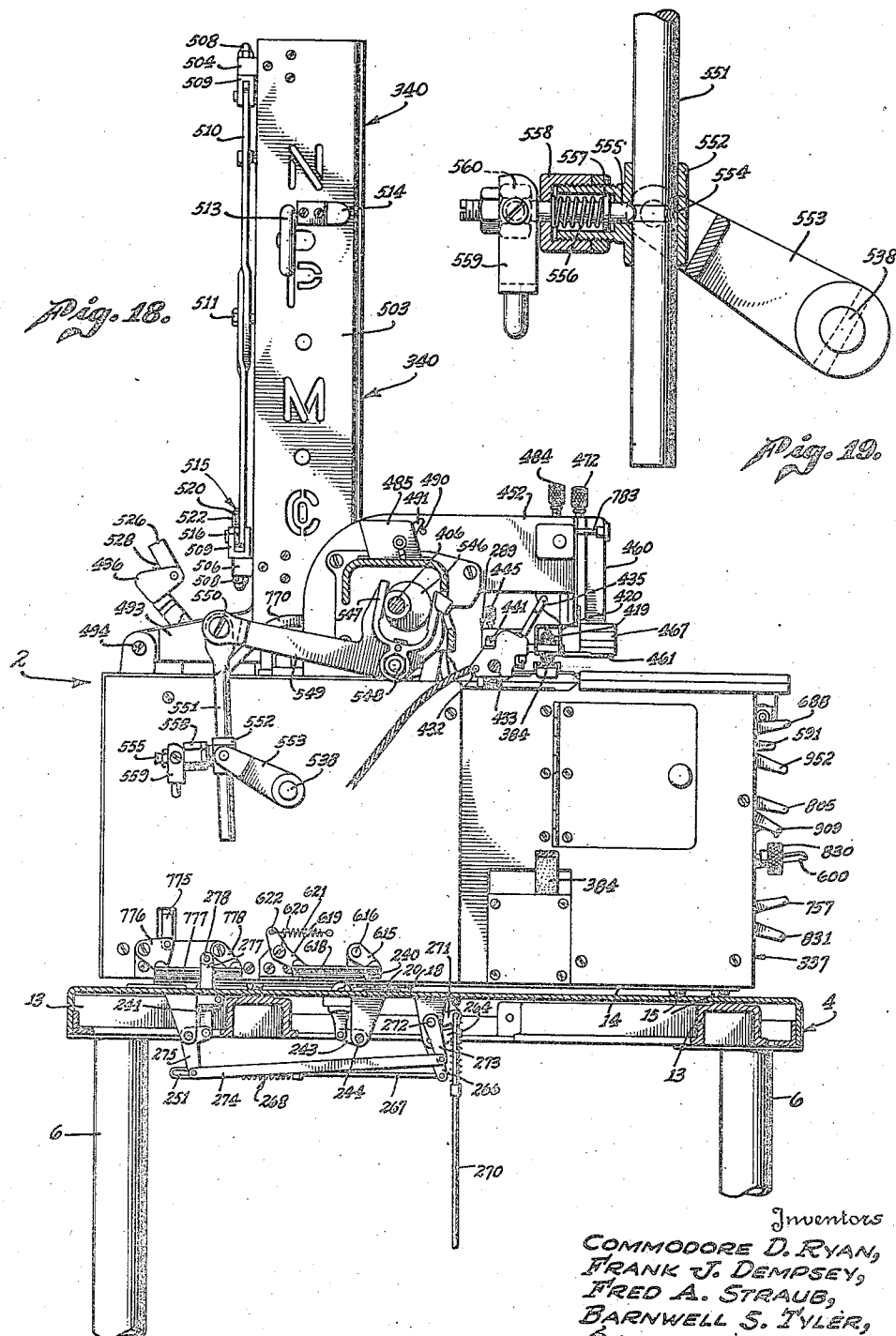
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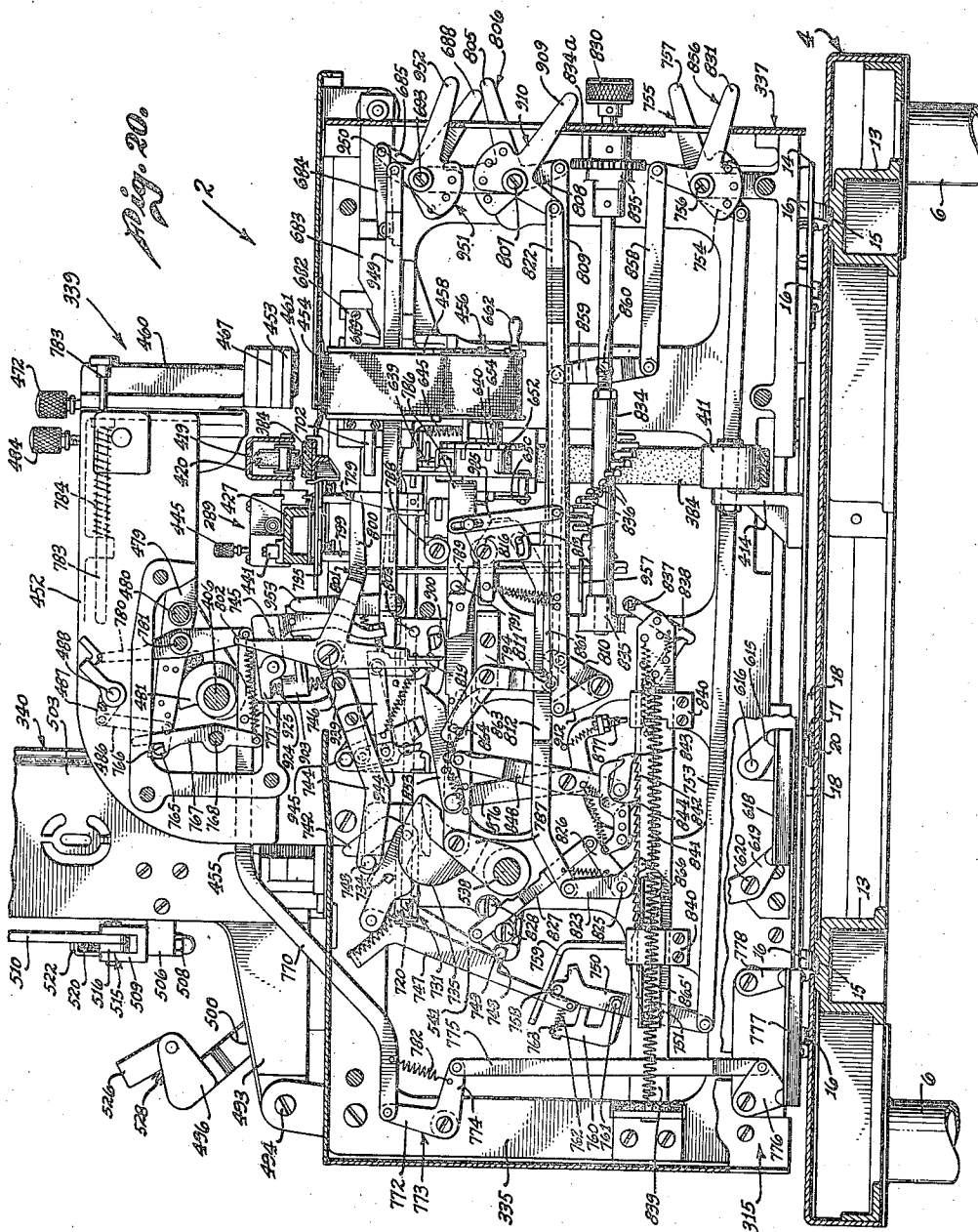
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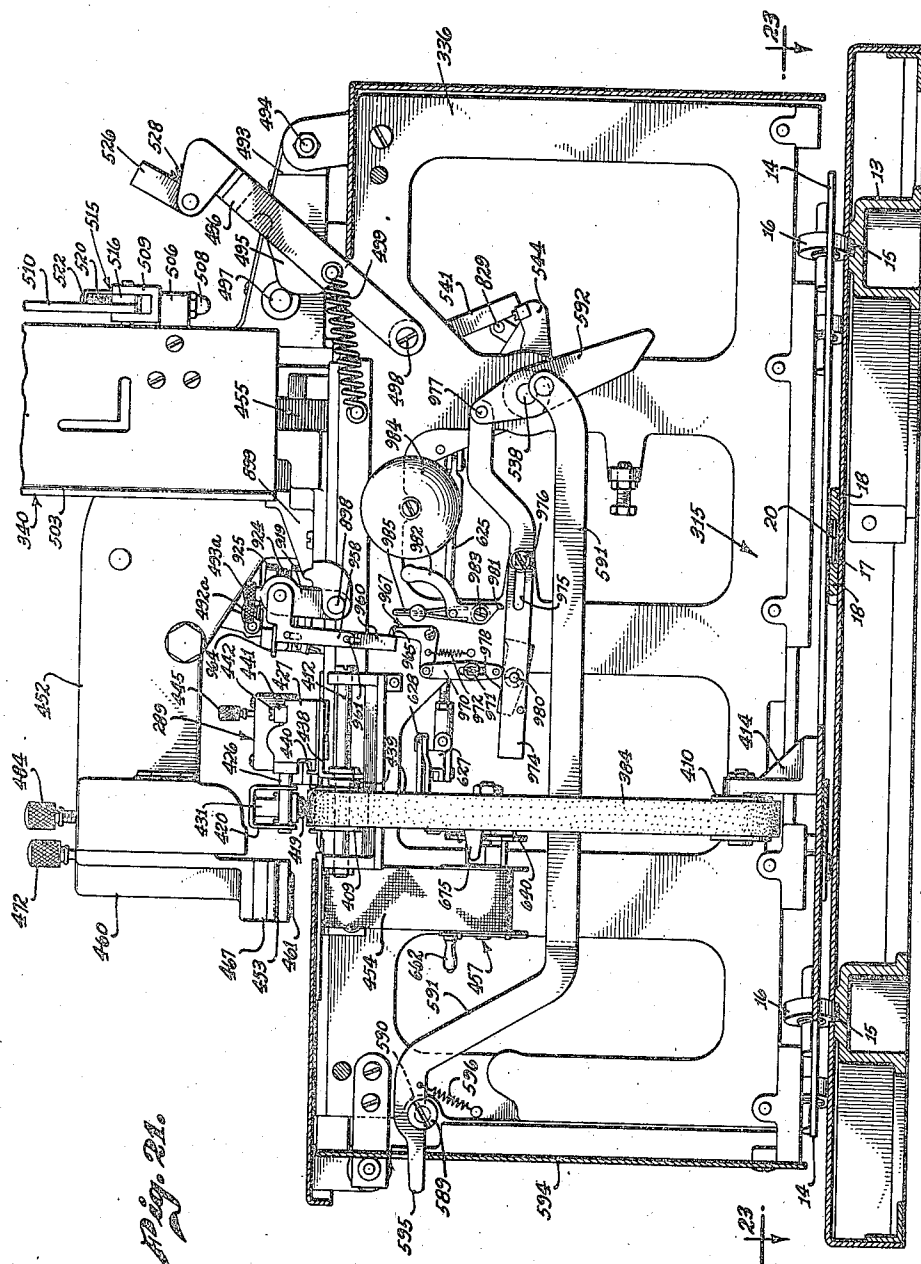
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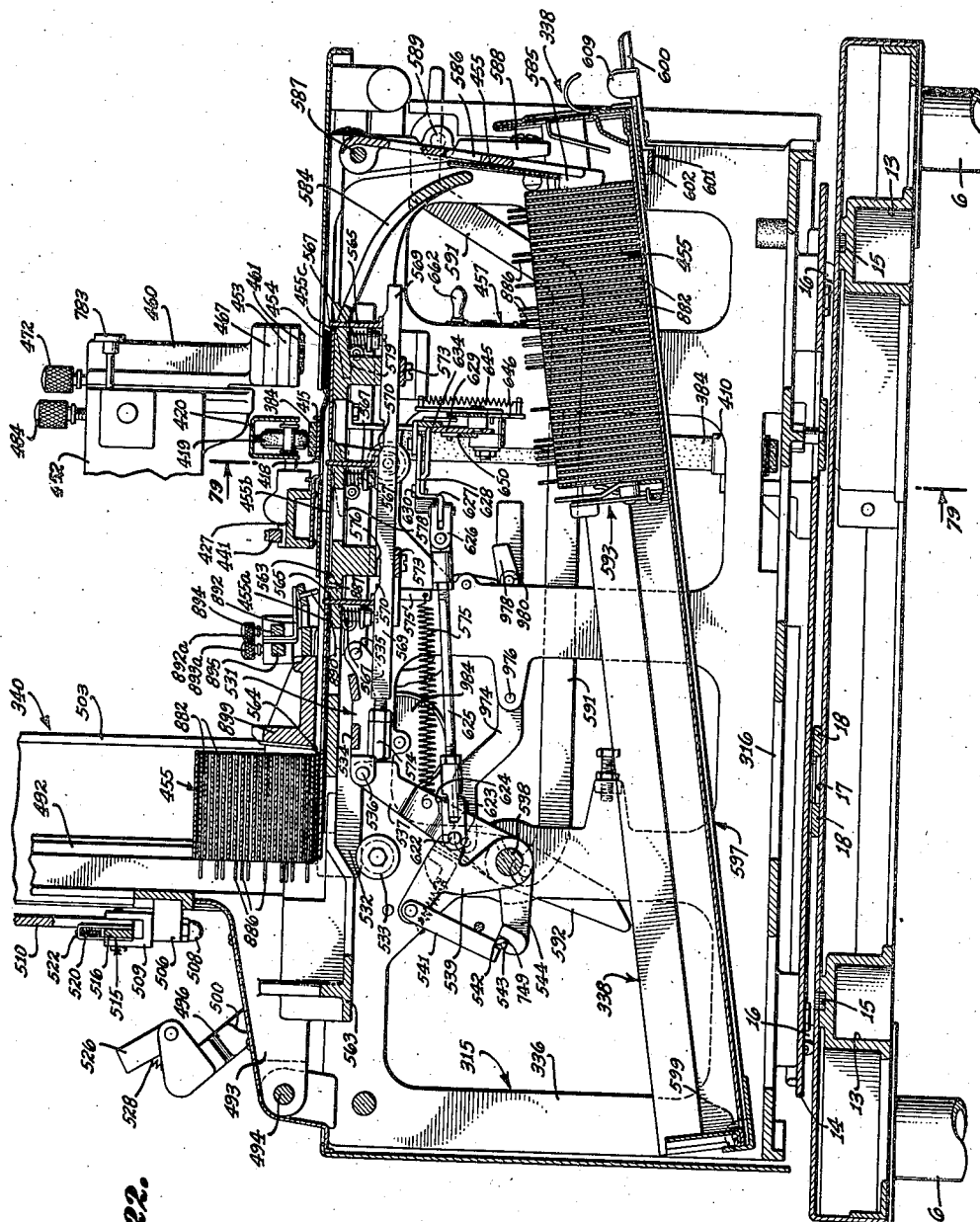


Fig. 22.

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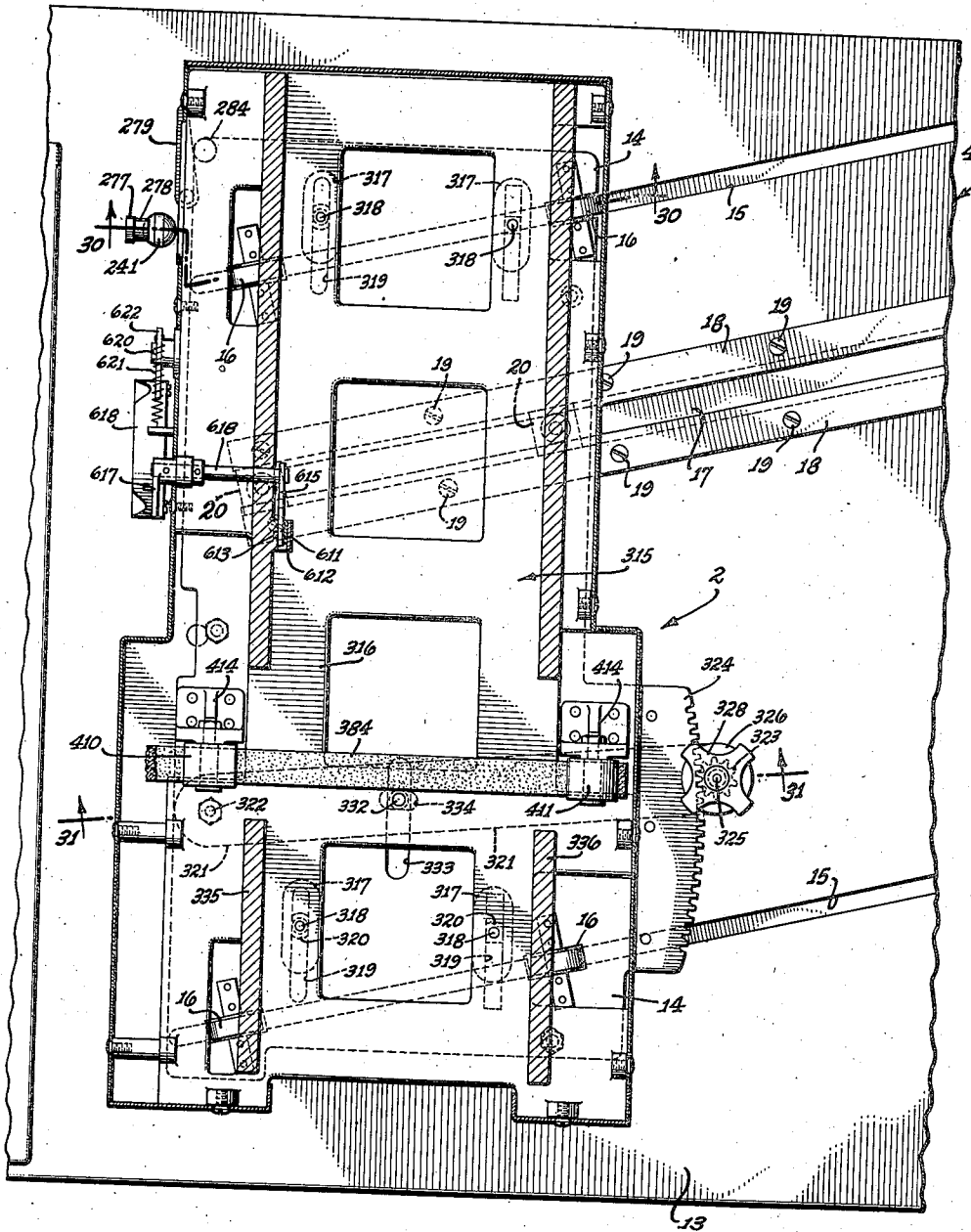


Fig. 23.

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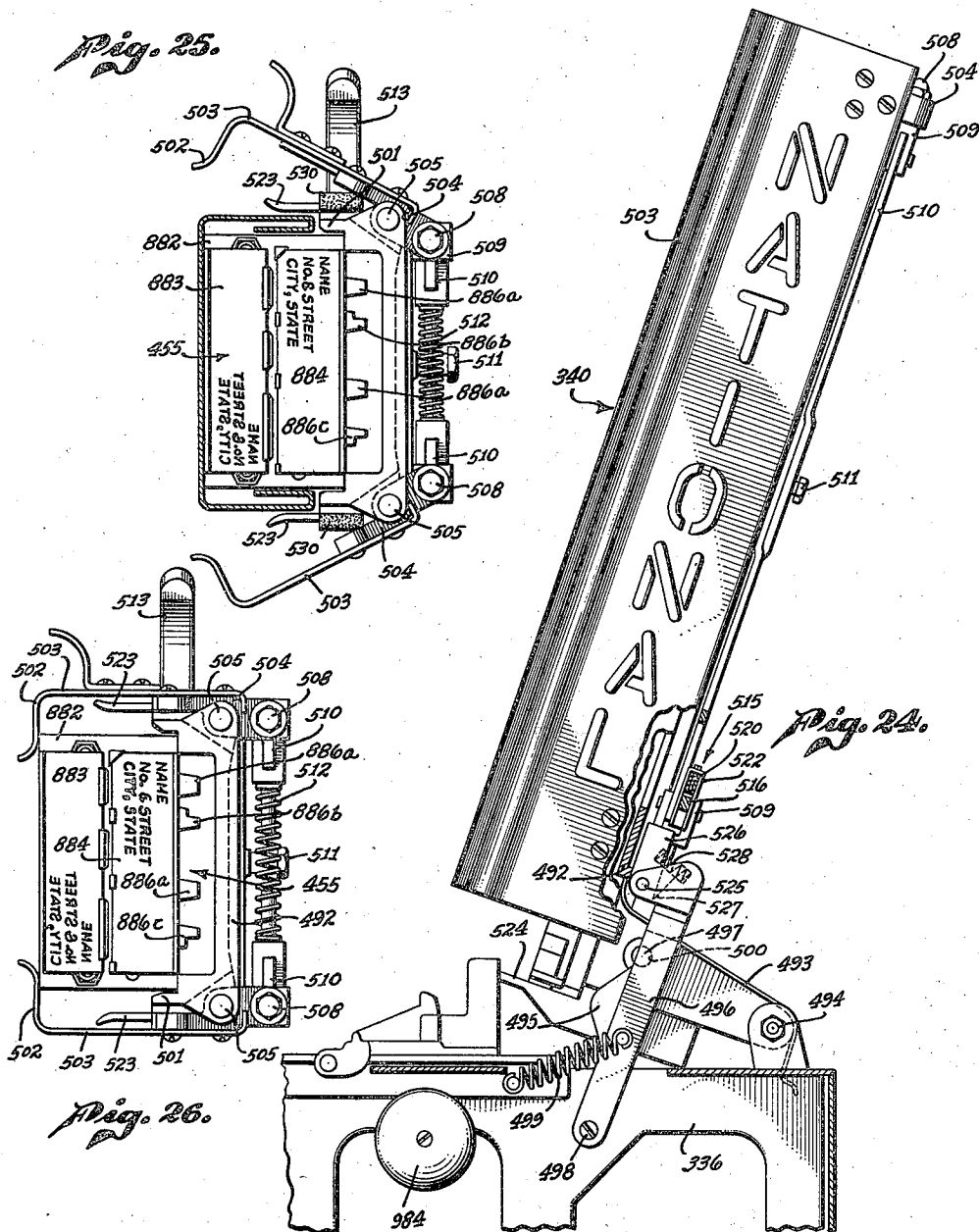
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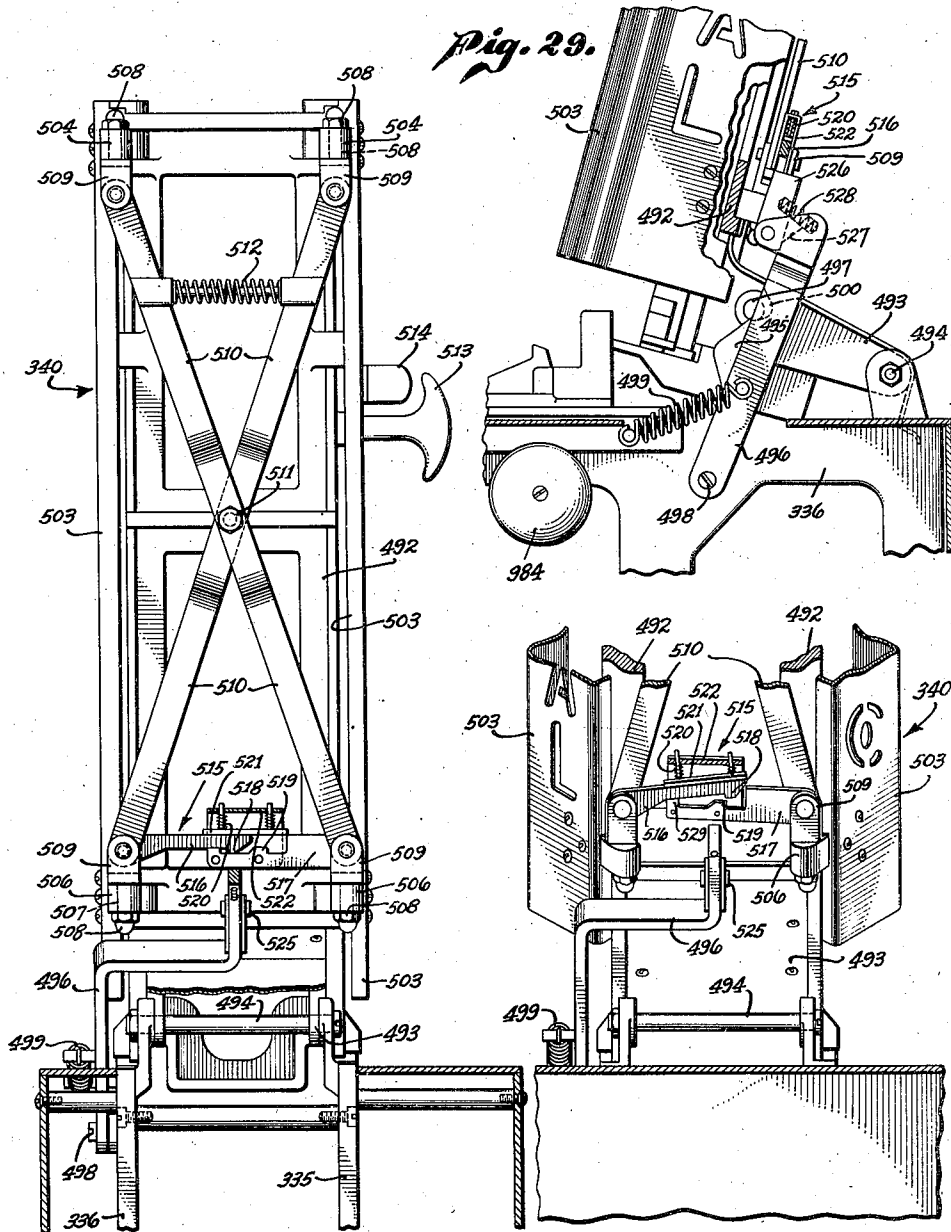


Fig. 27.

Fig. 28.

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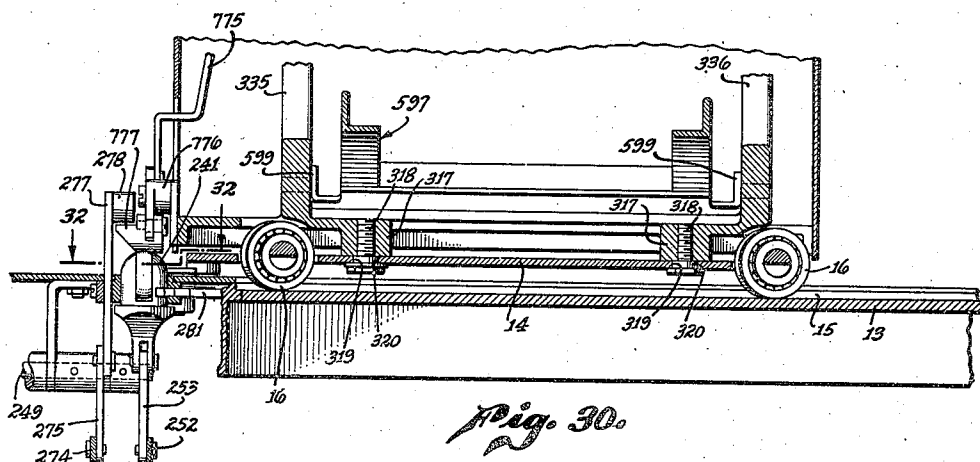


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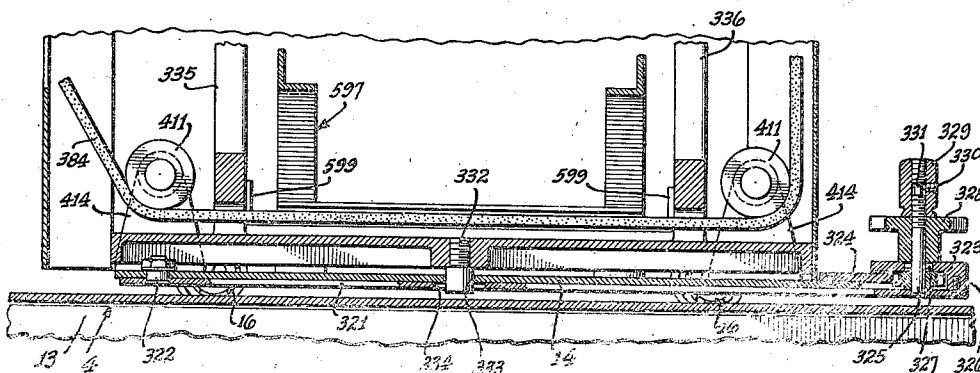


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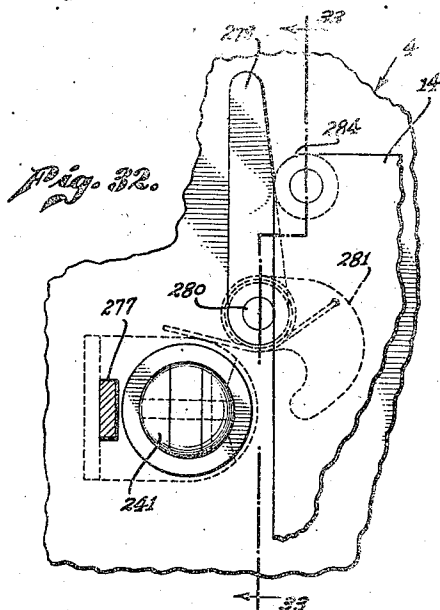


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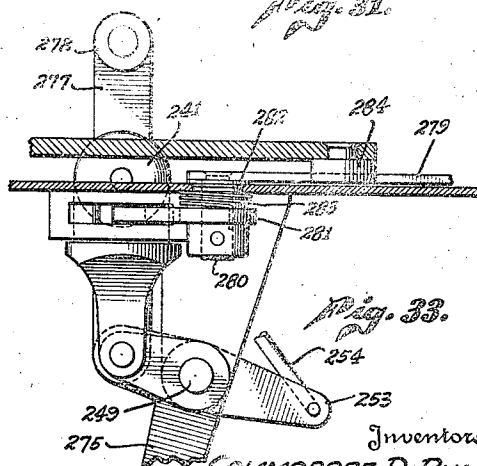


Fig. 33.

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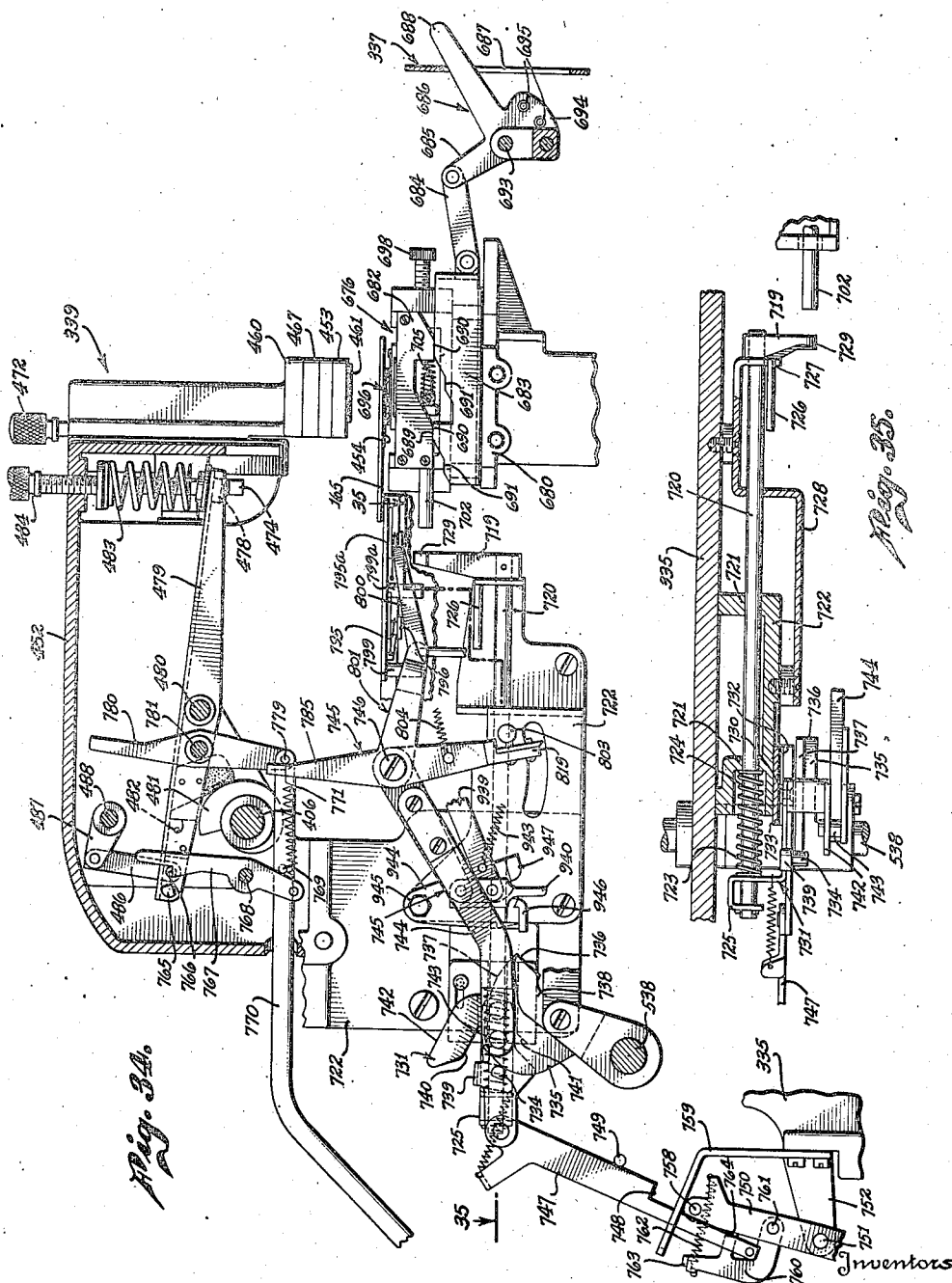
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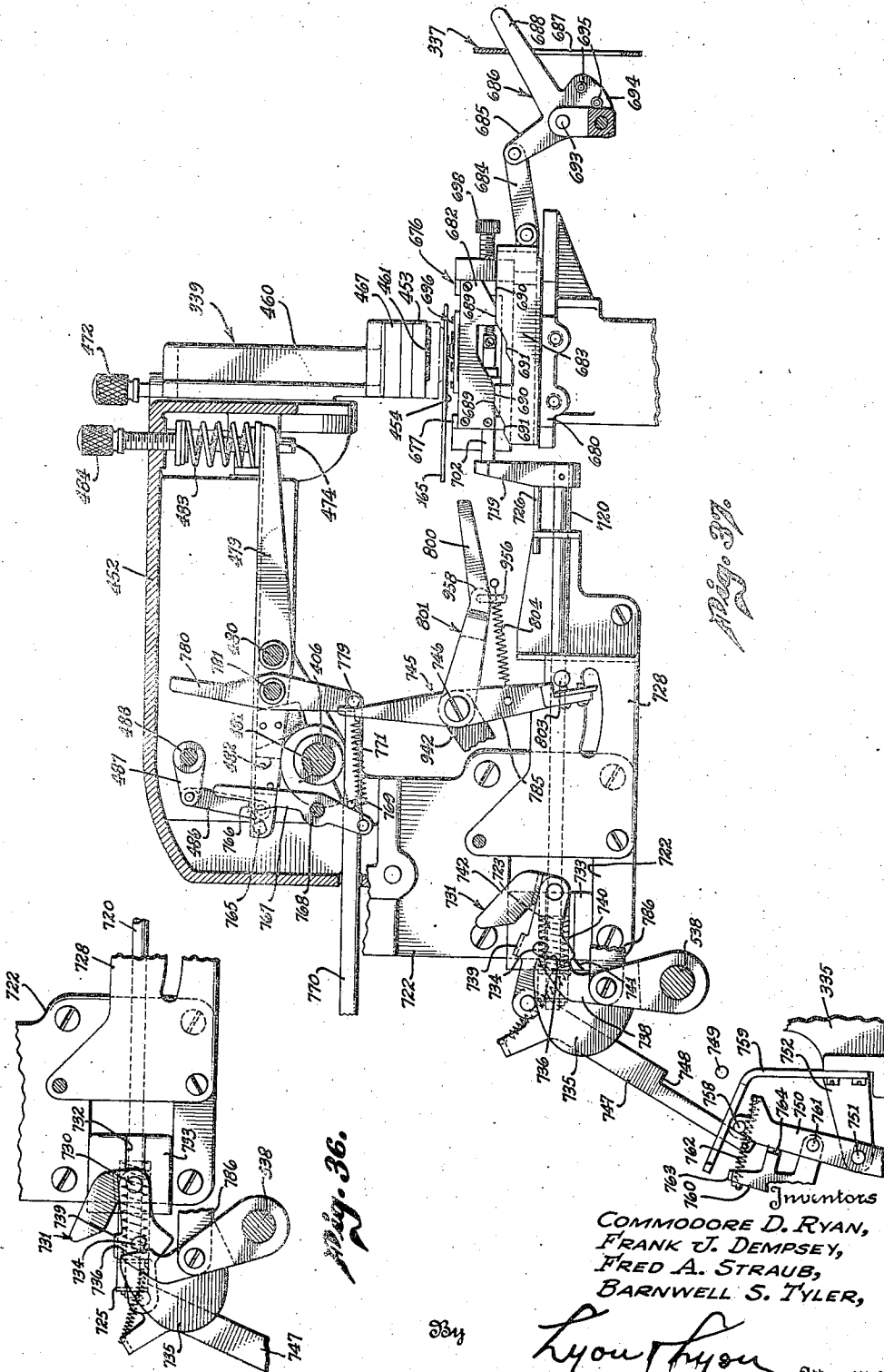
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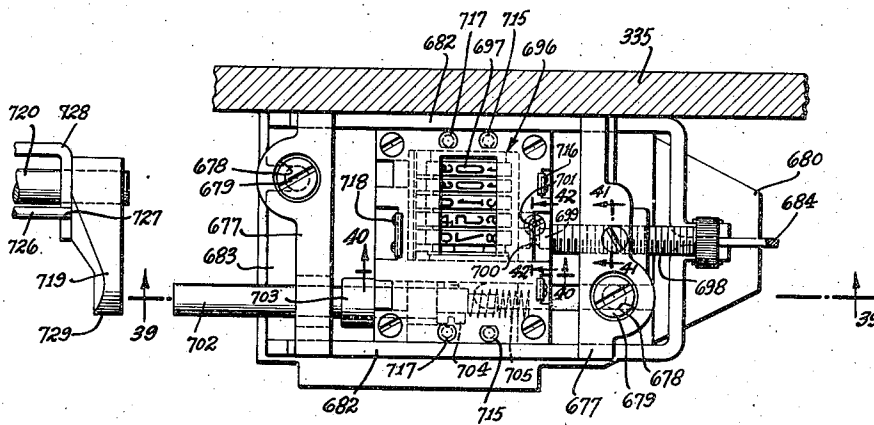


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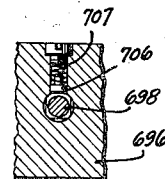


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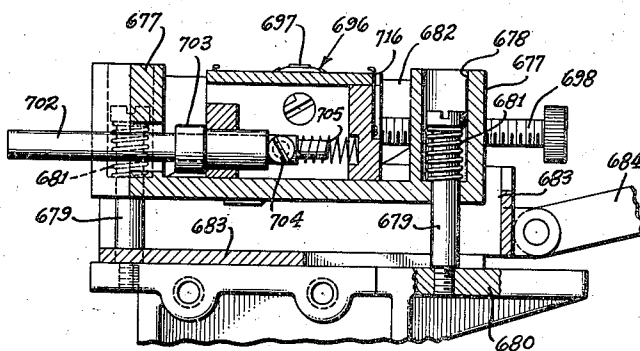


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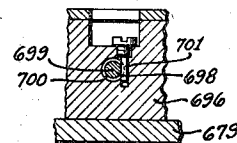


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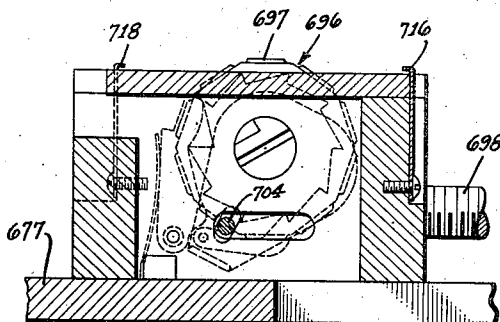


Fig. 40.

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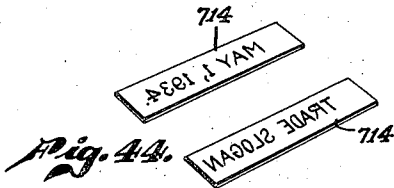


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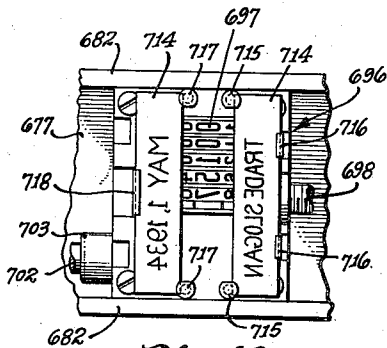
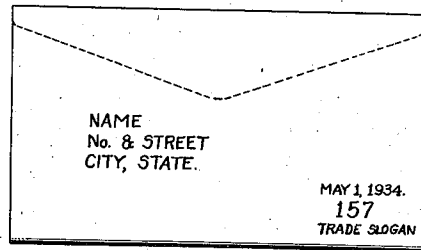


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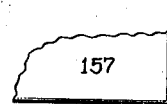


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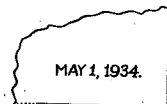


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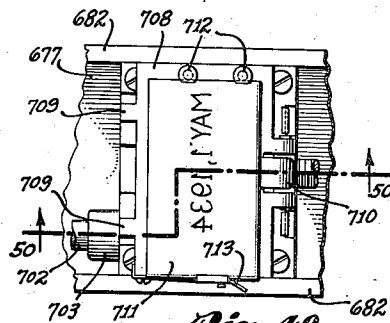


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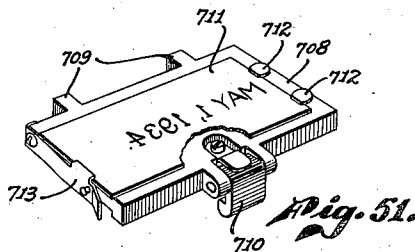


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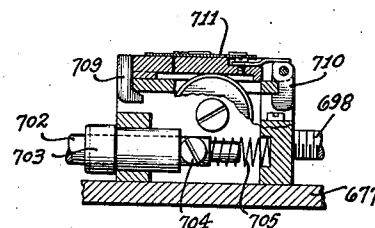


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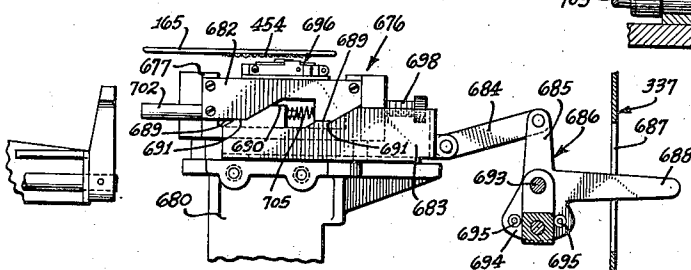


Fig. 48.

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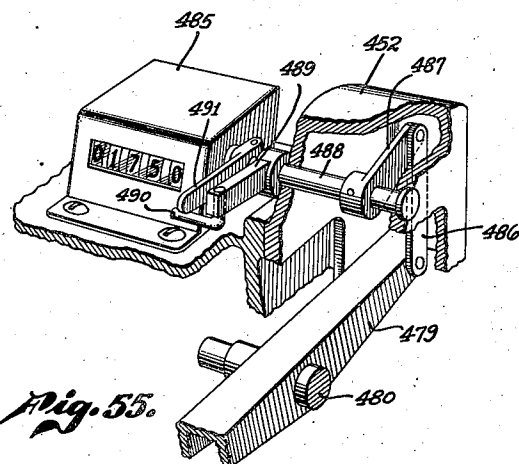
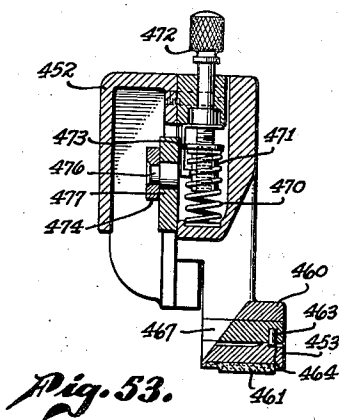
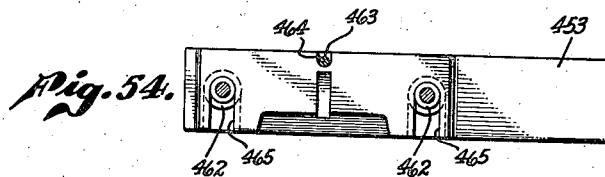
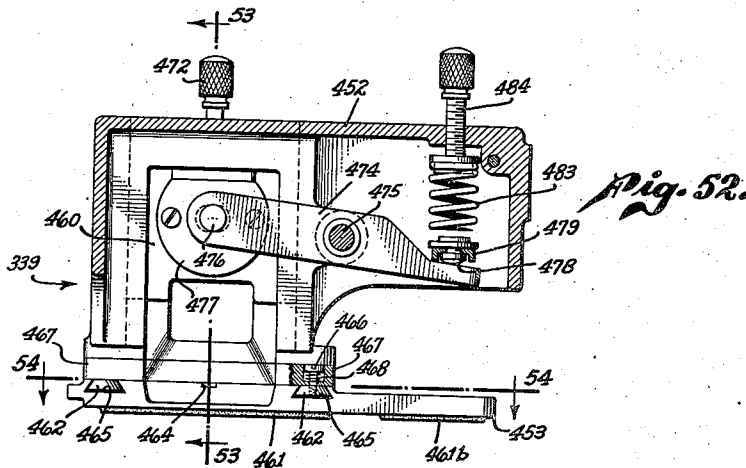
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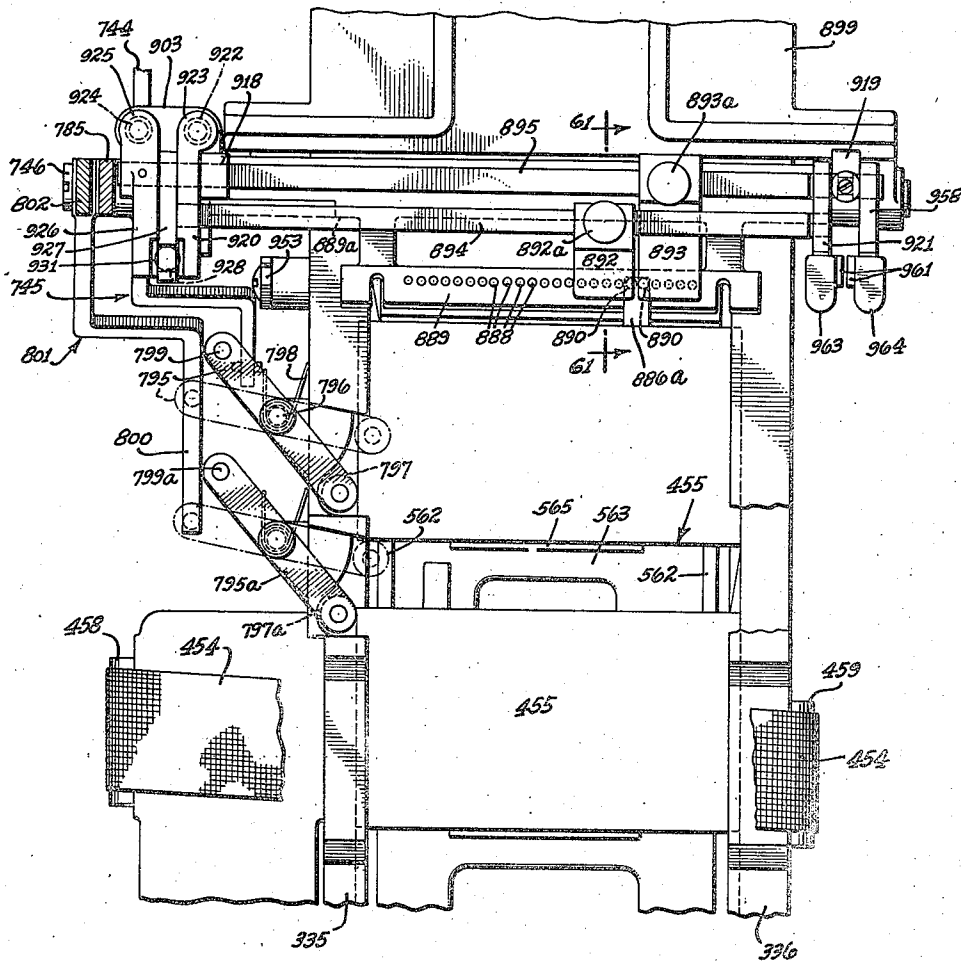


Fig. 56.

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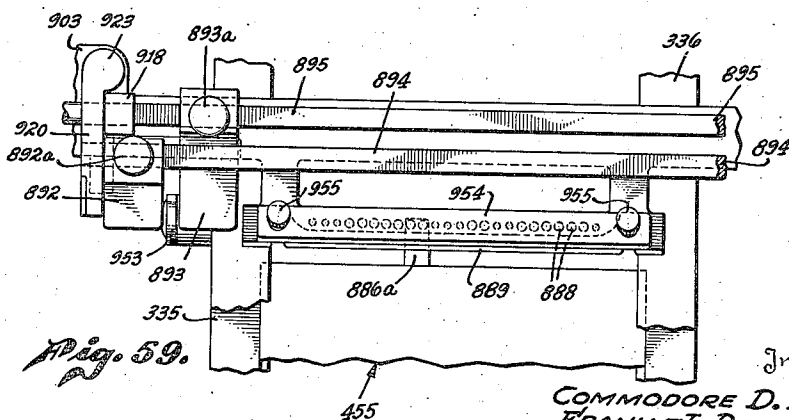
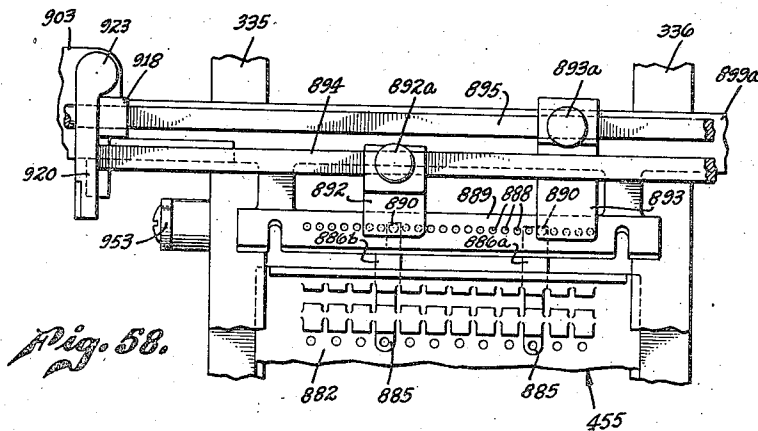
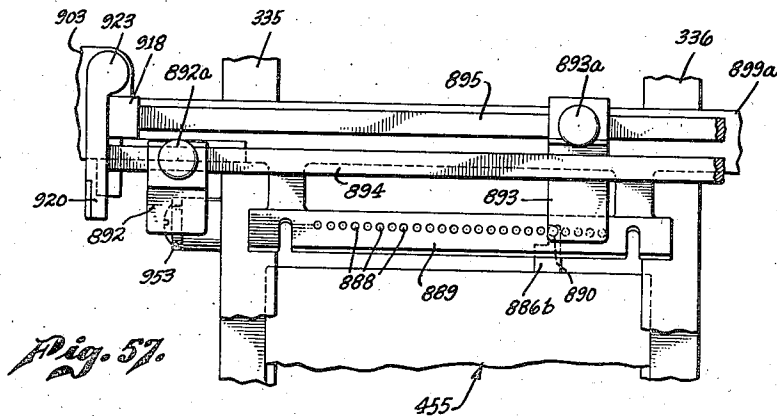
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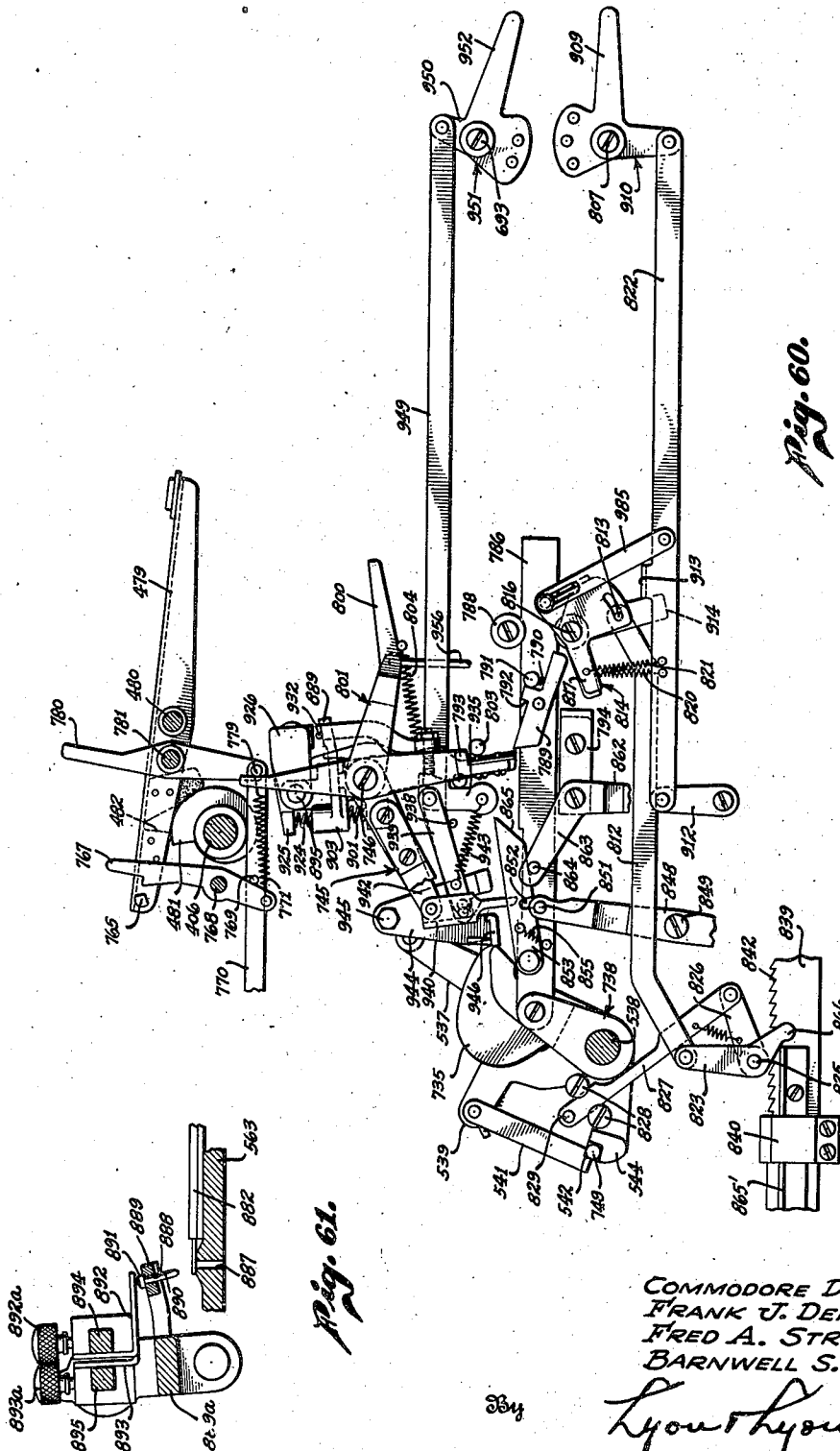
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2,406,040

PRINTING MACHINE

Filed Nov. 2, 1940

50 Sheets-Sheet 34

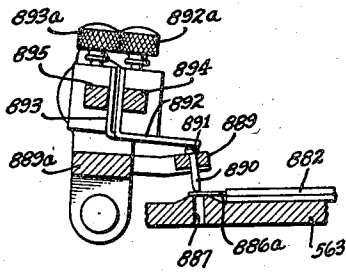


Fig. 63.

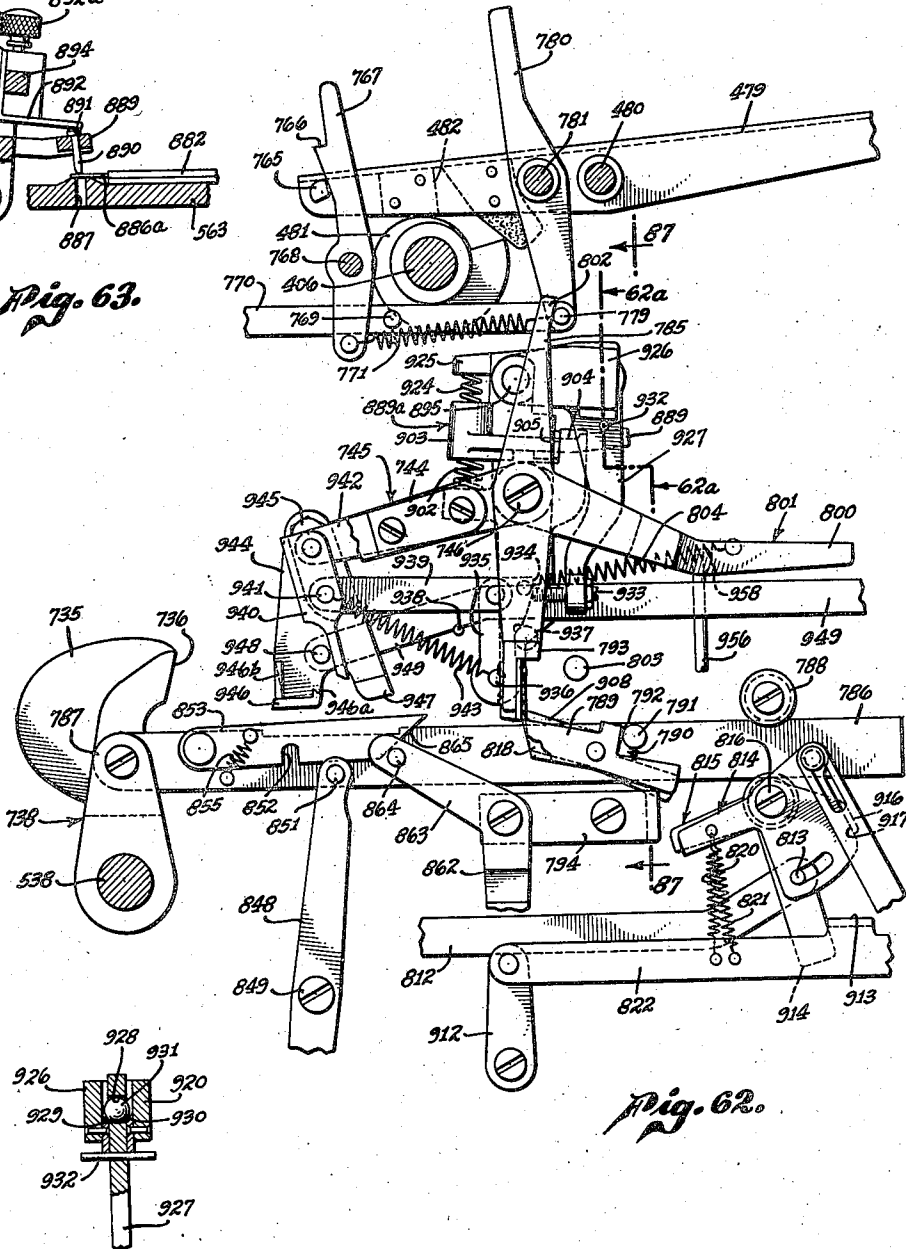


Fig. 62.

Fig. 62a.

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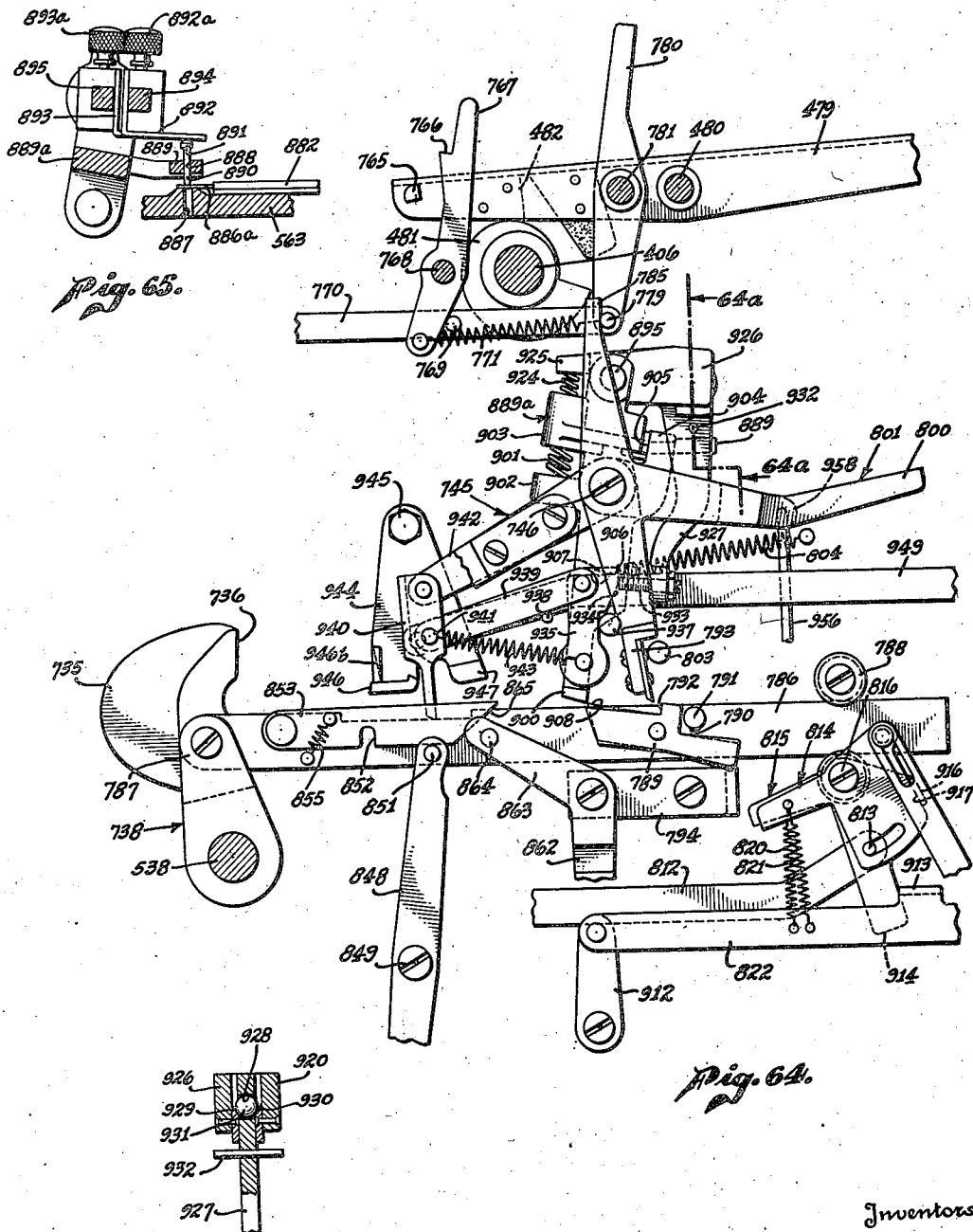
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50 Sheets-Sheet 35



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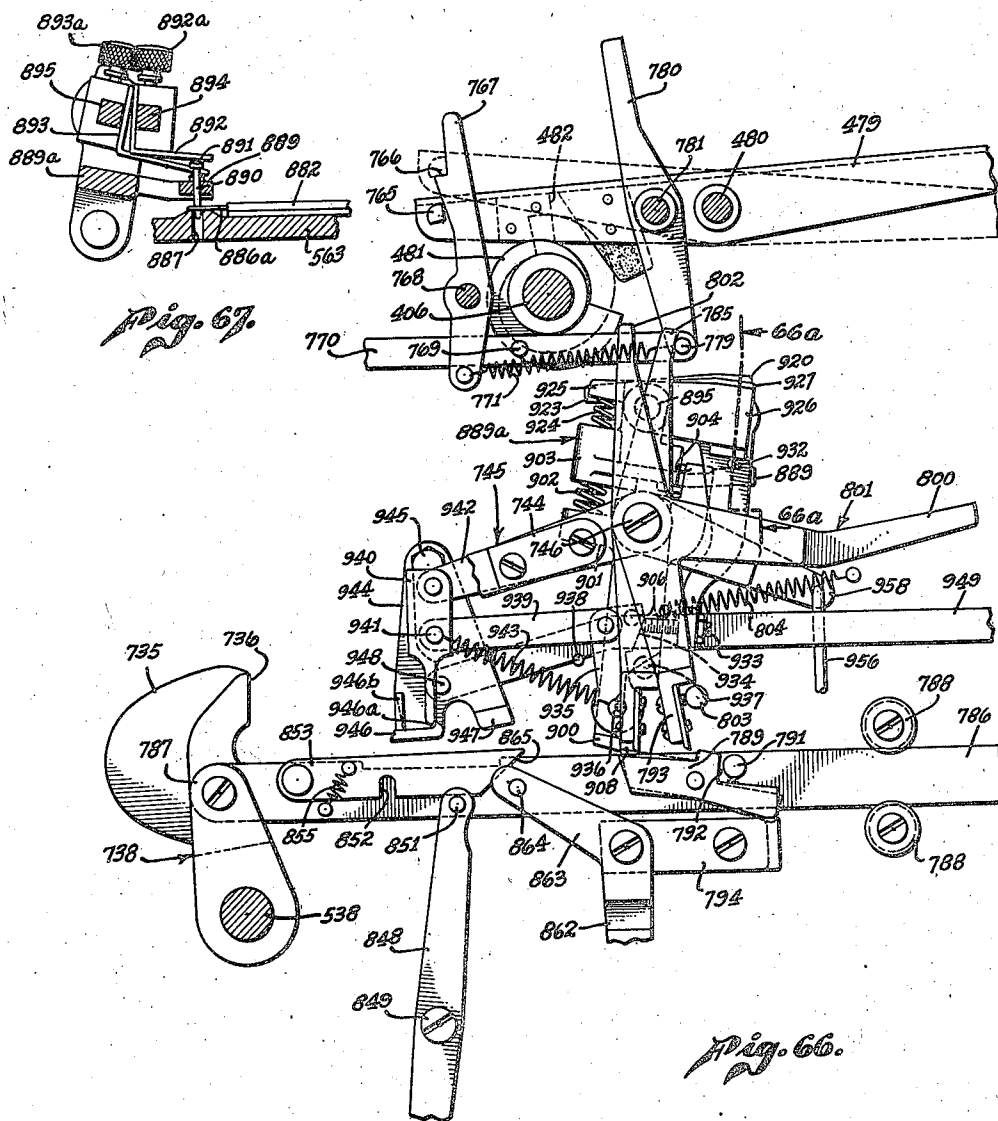


Fig. 67.

Fig. 66.

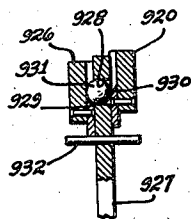


Fig. 66a.

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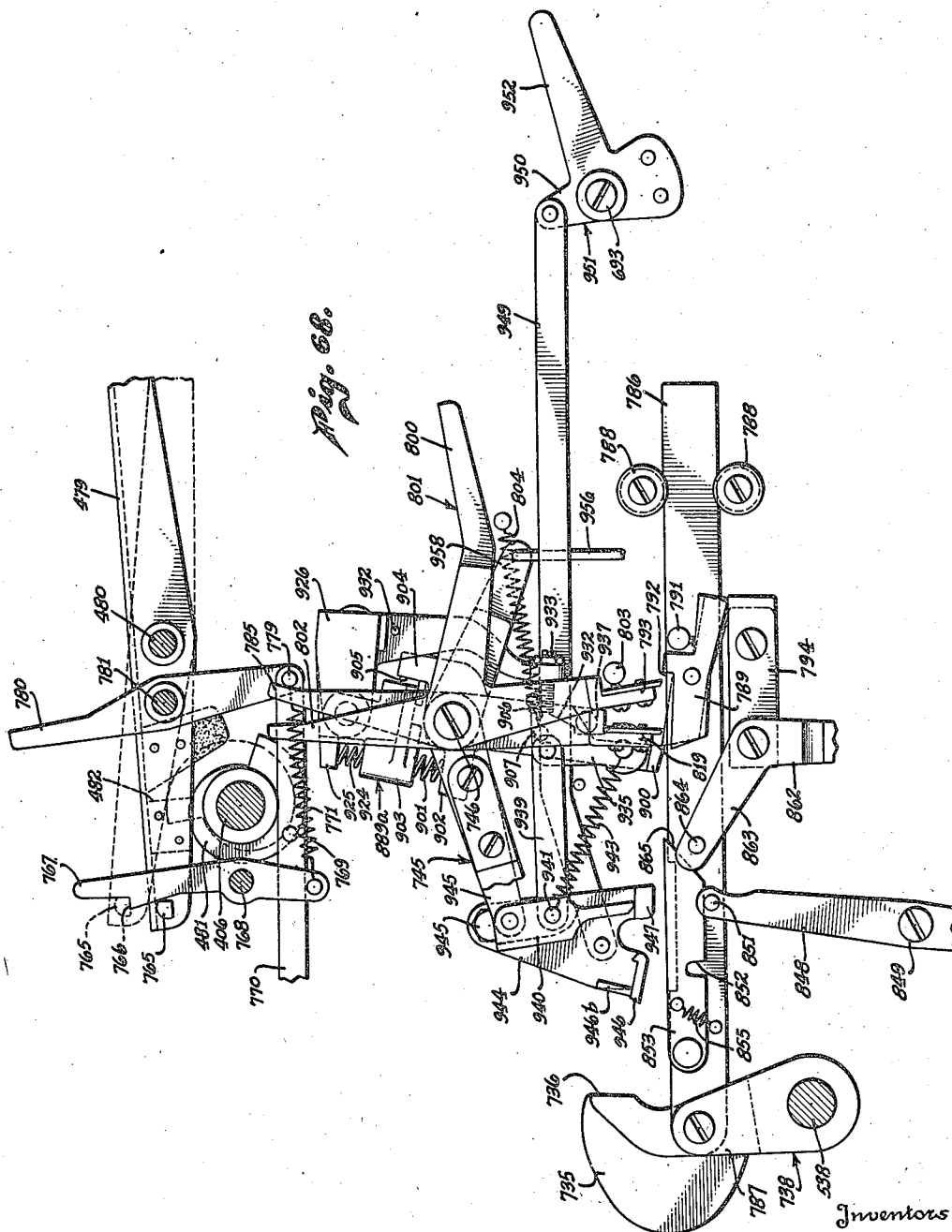


Fig. 38.

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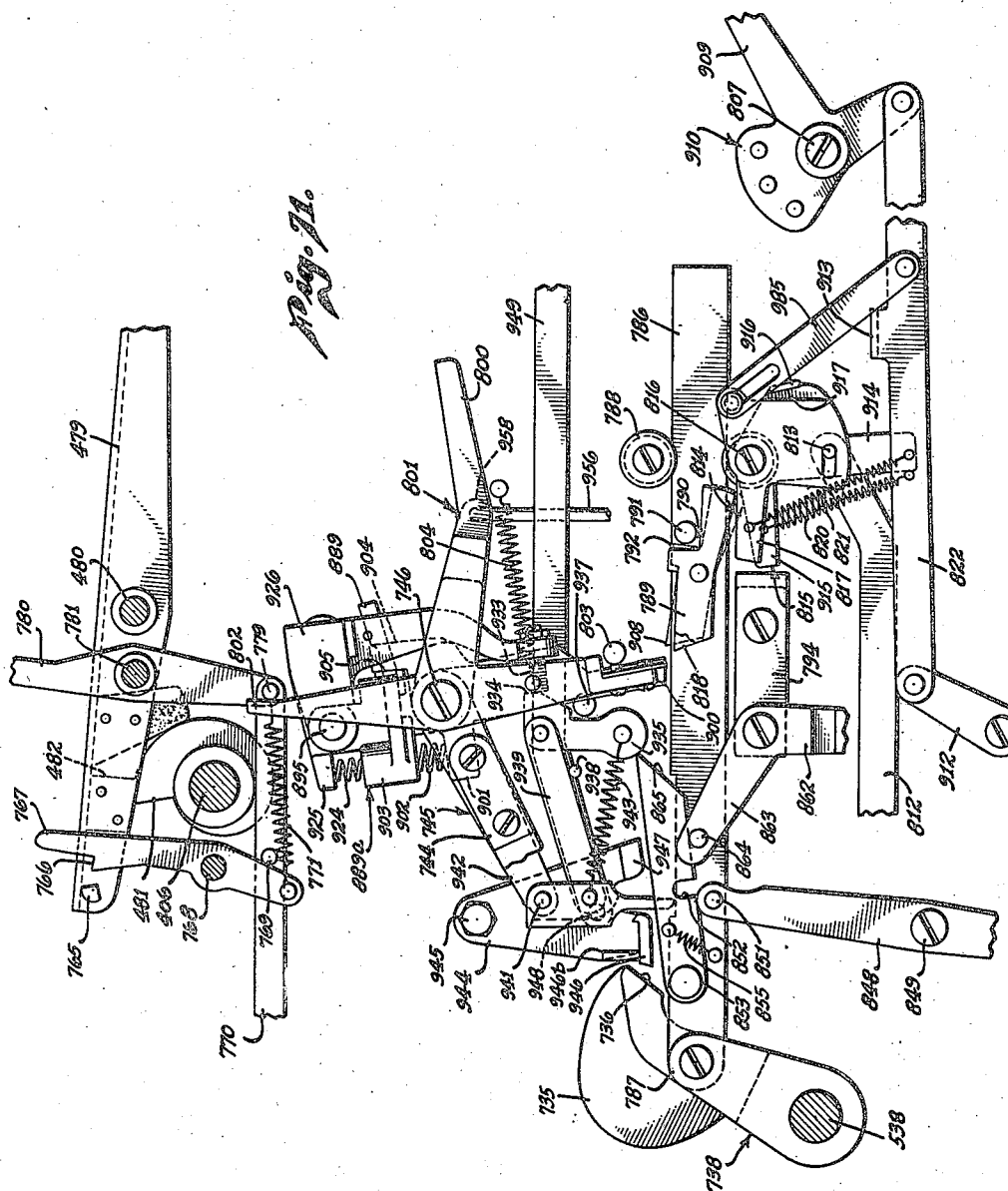
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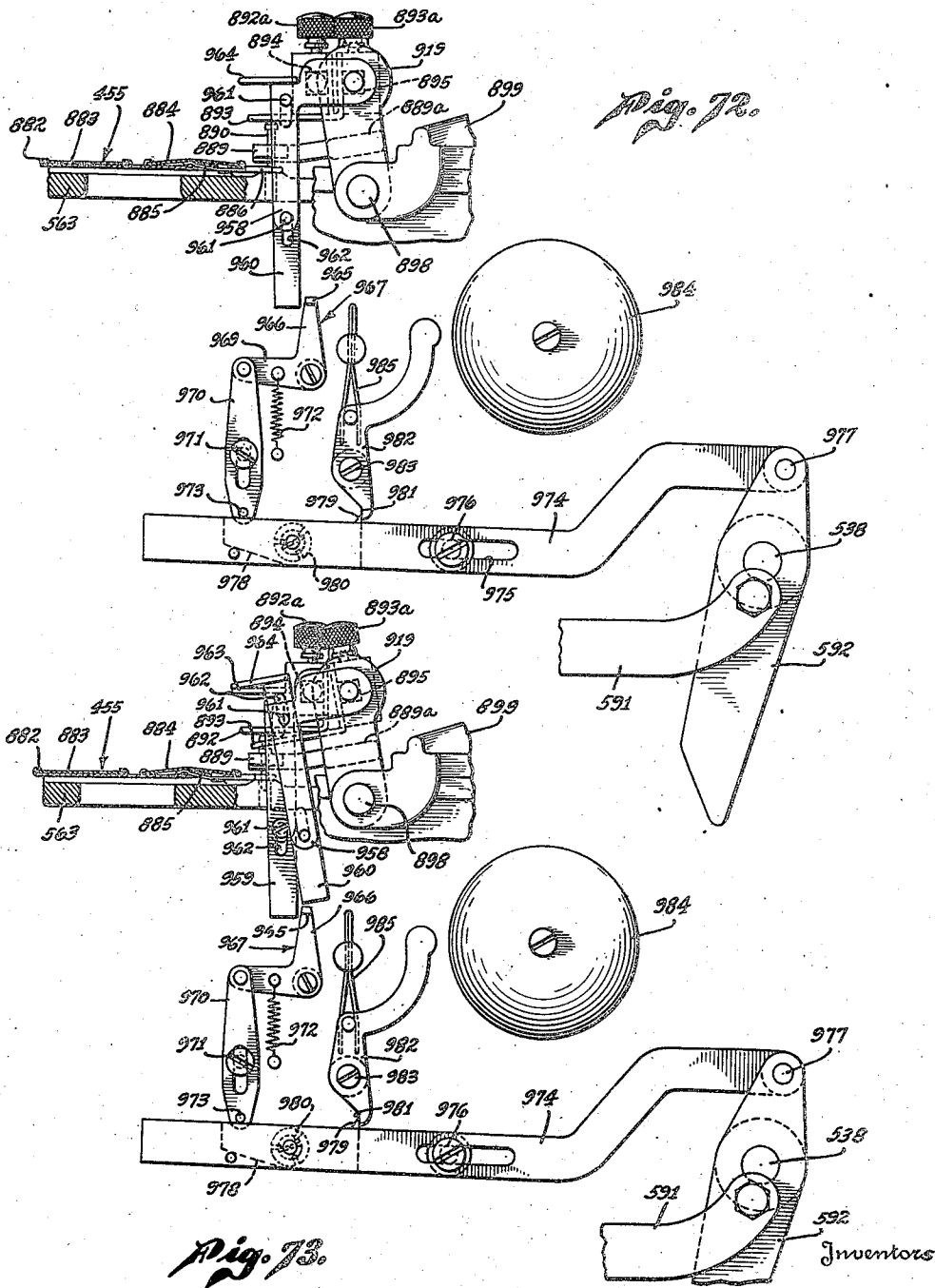
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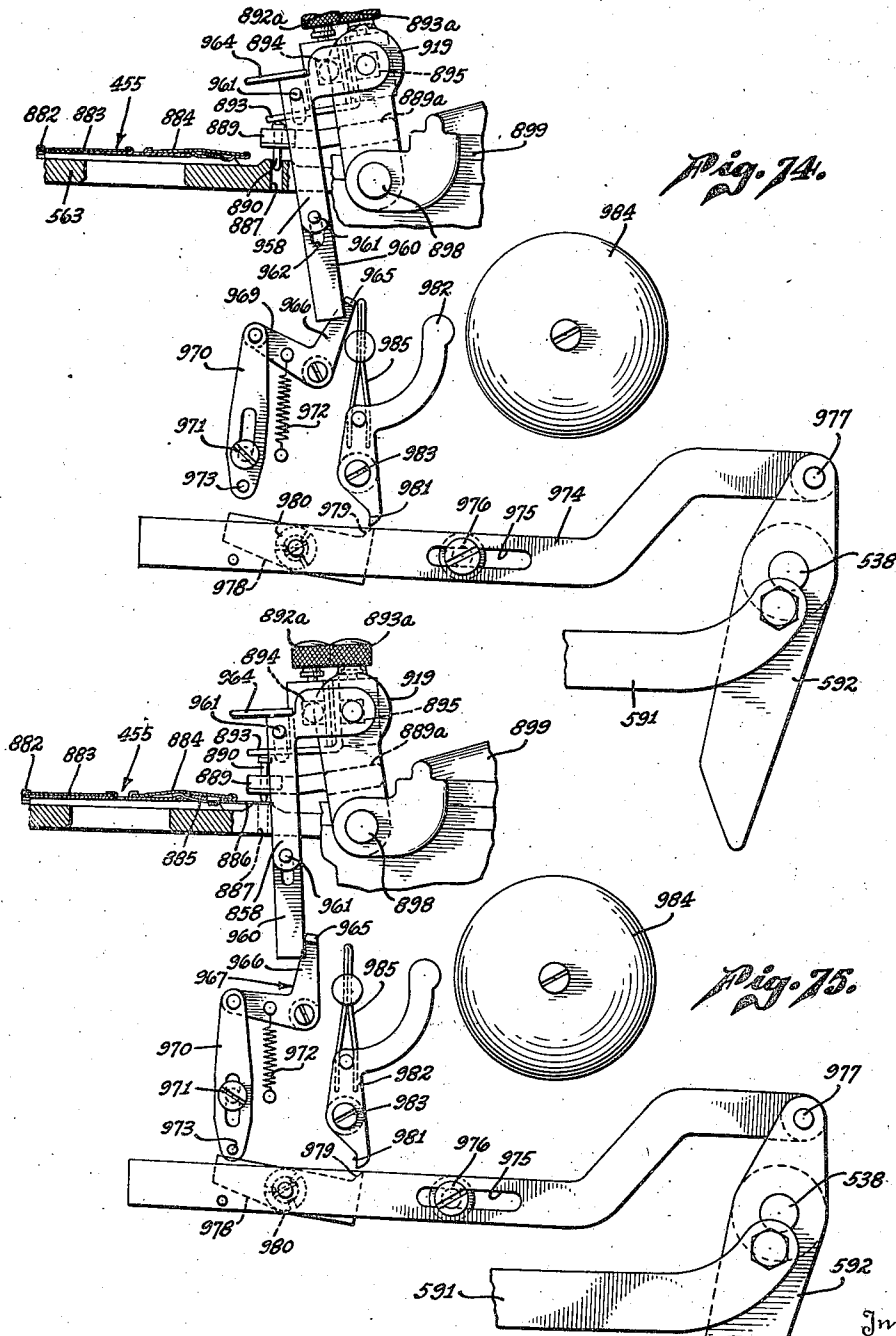


Fig. 74.

Fig. 75.

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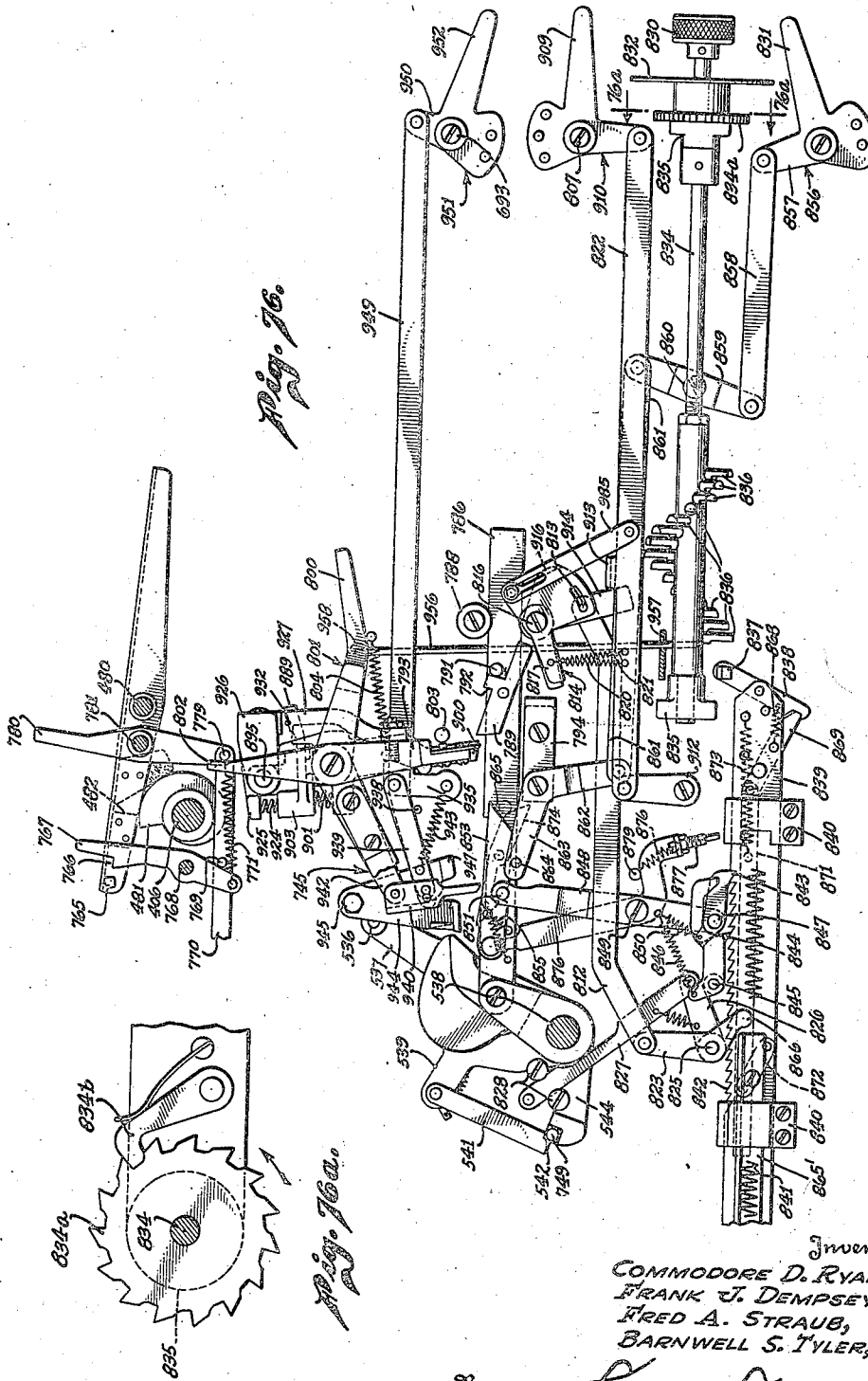
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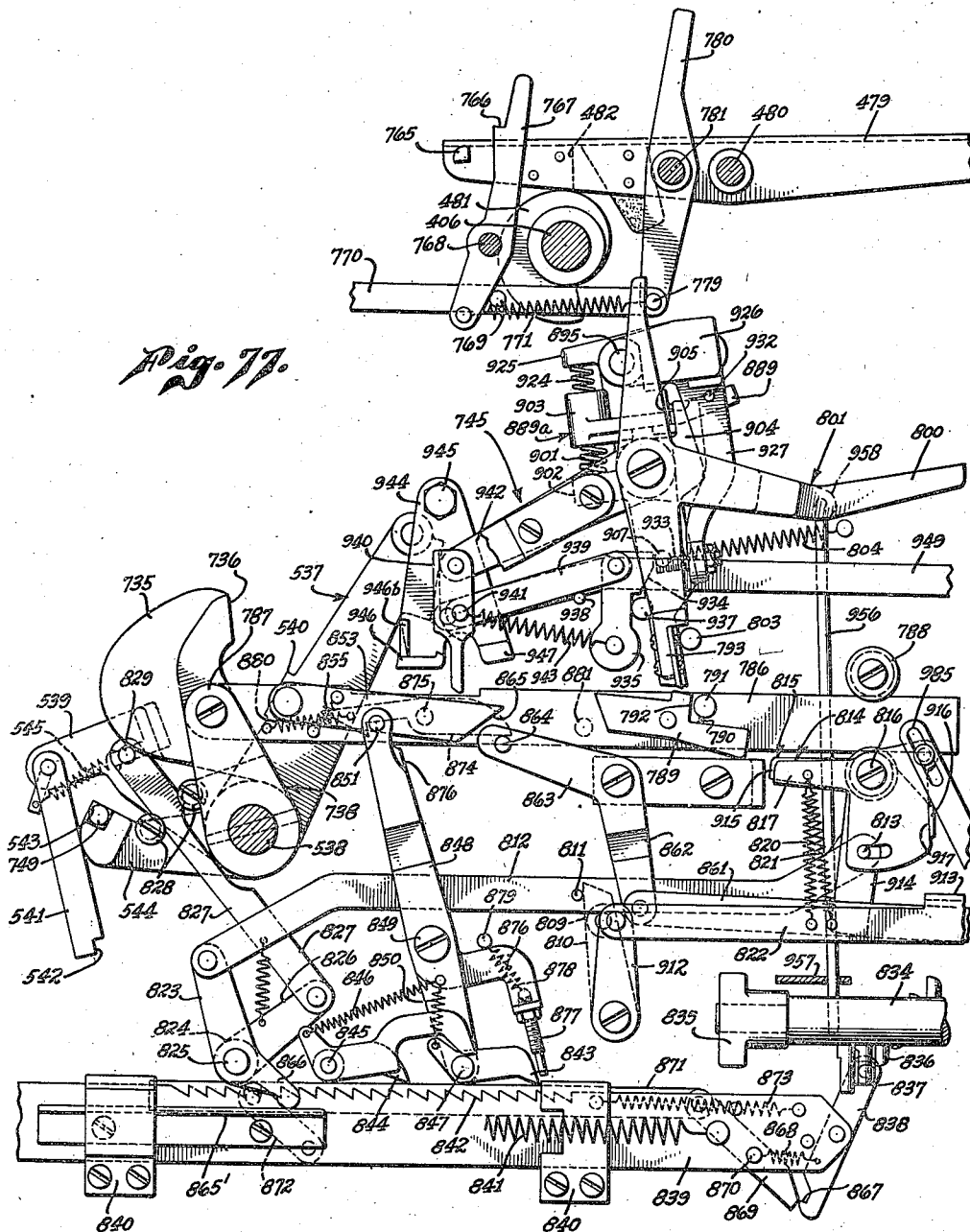
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50 Sheets-Sheet 43



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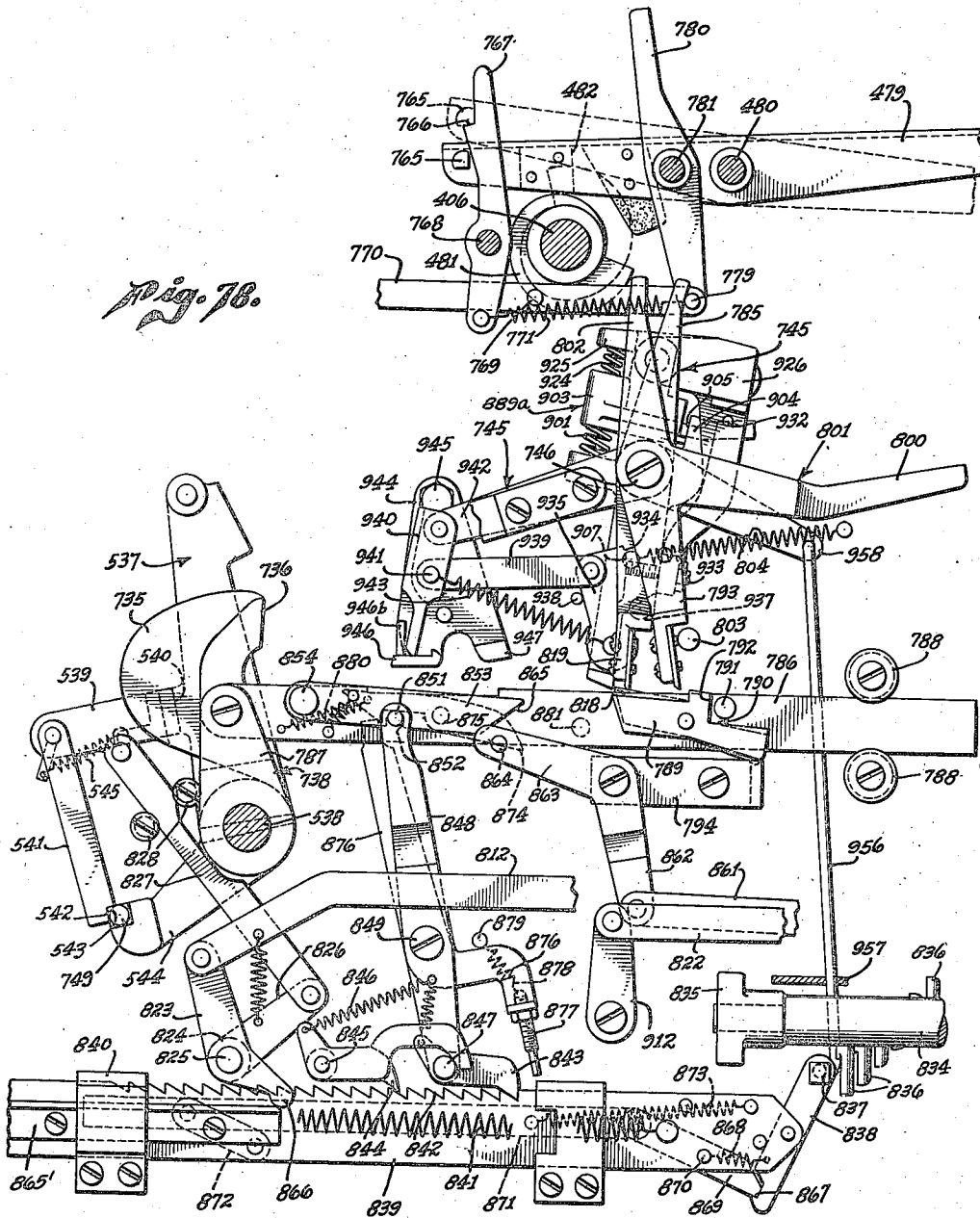
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Fig. 76.



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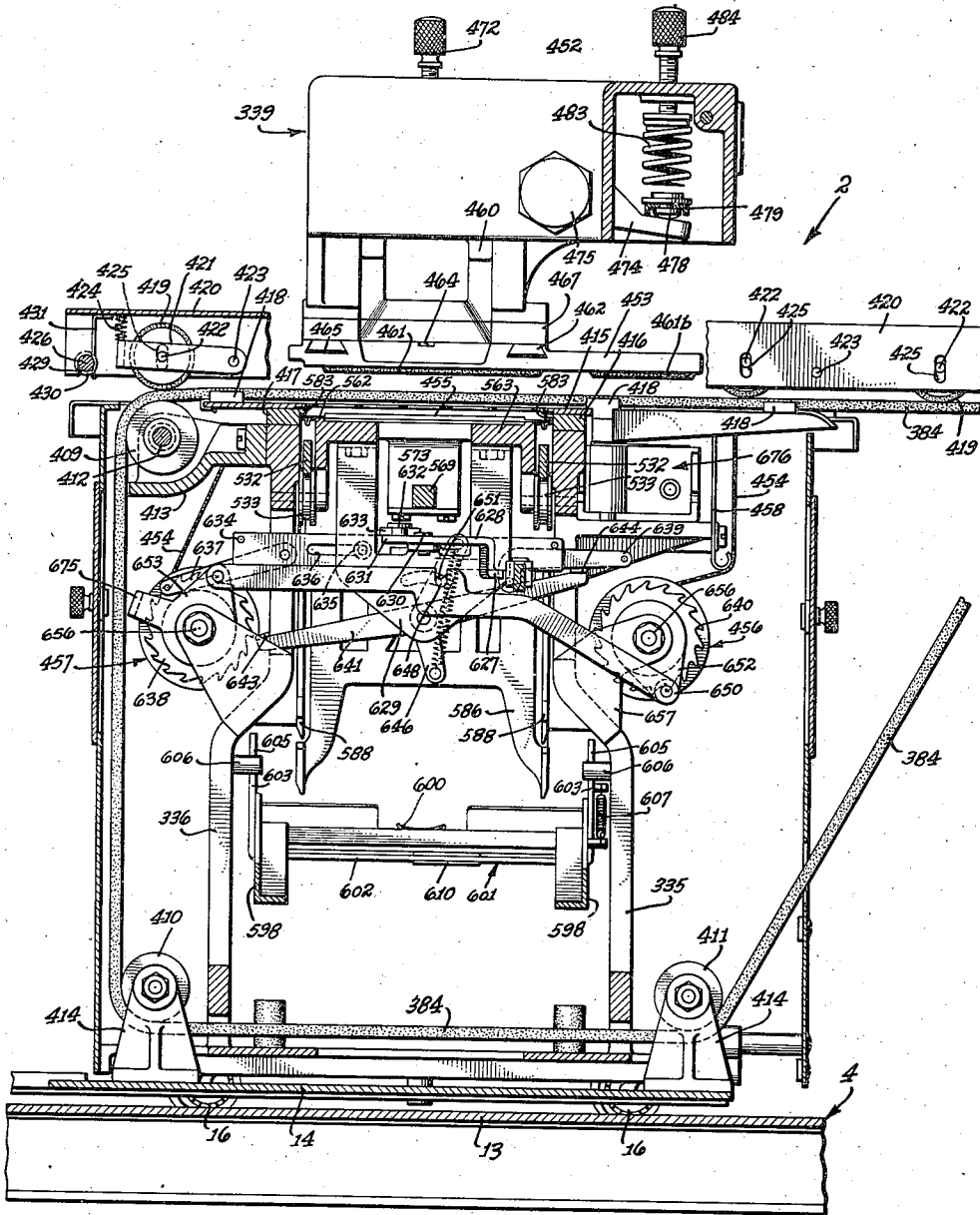


Fig. 79.

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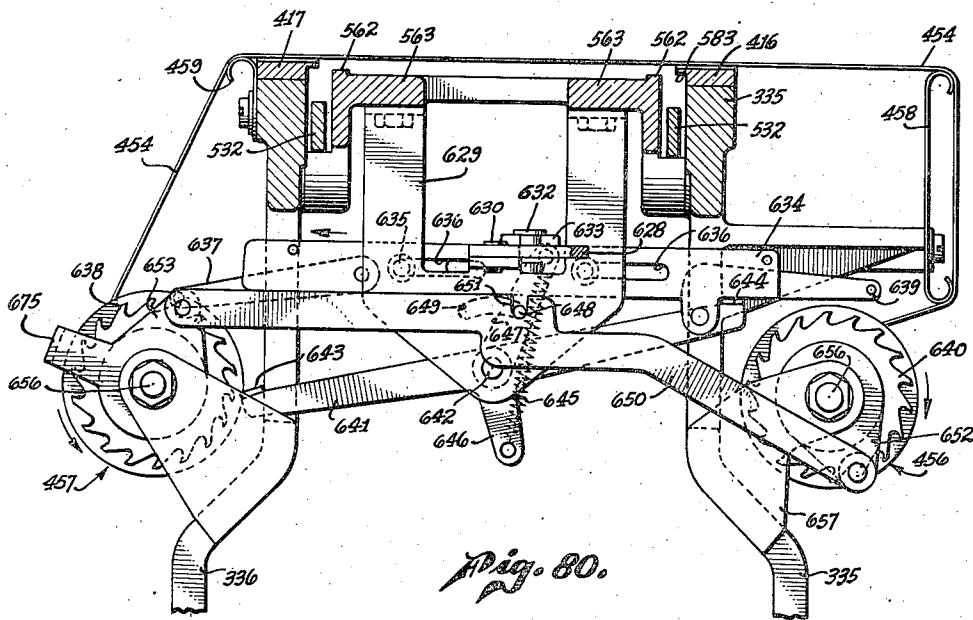


Fig. 80.

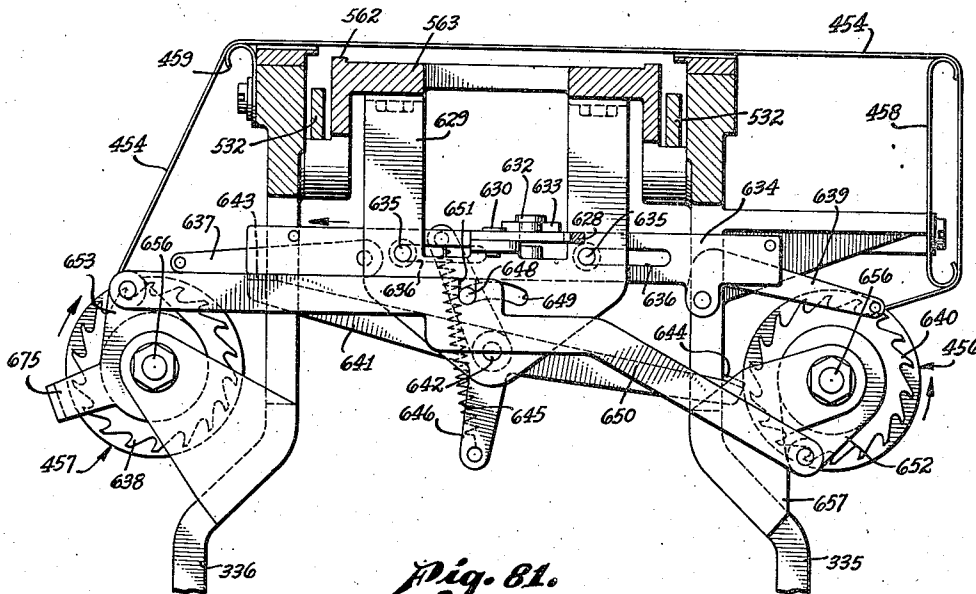


Fig. 81.

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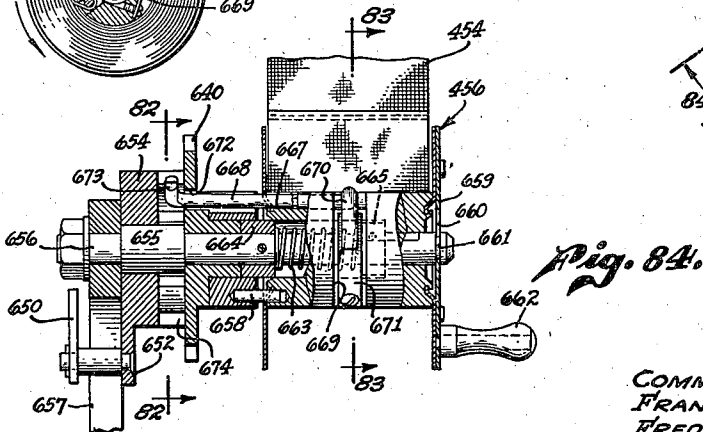
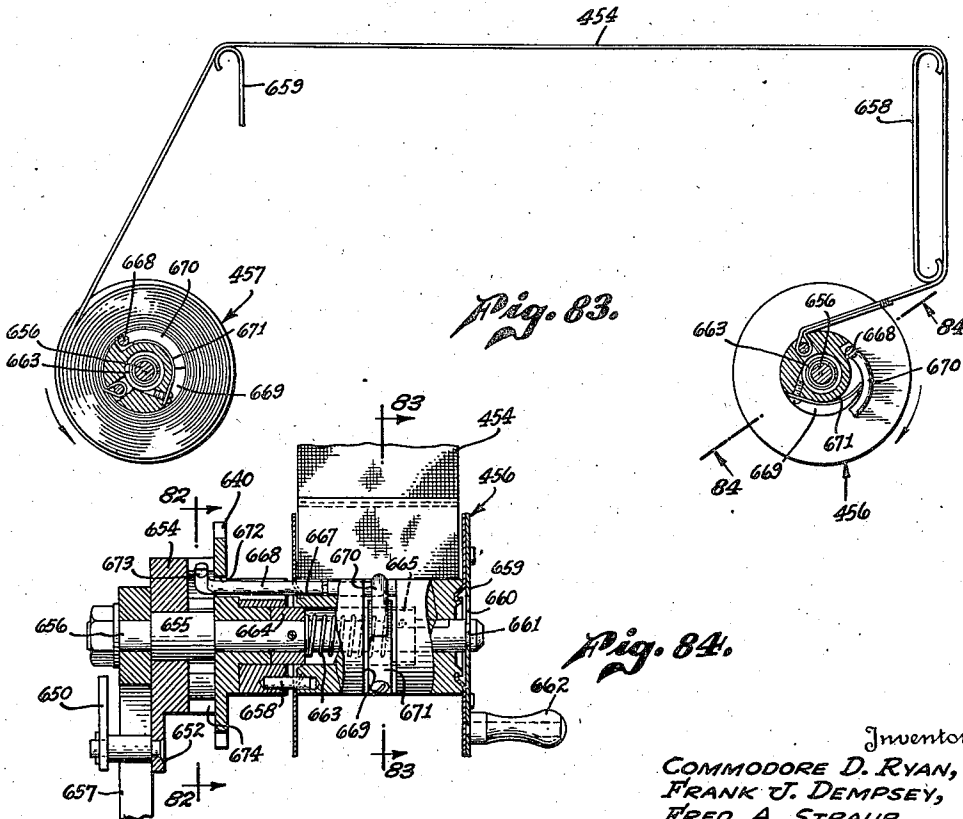
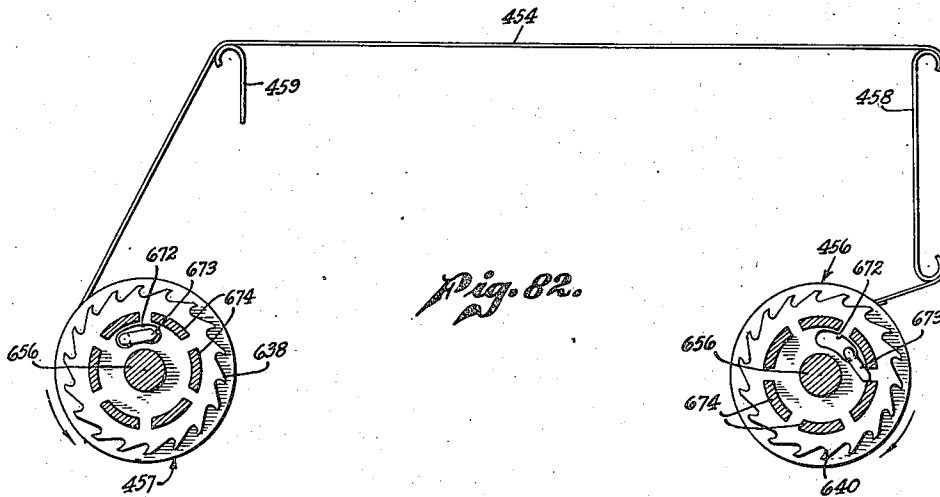
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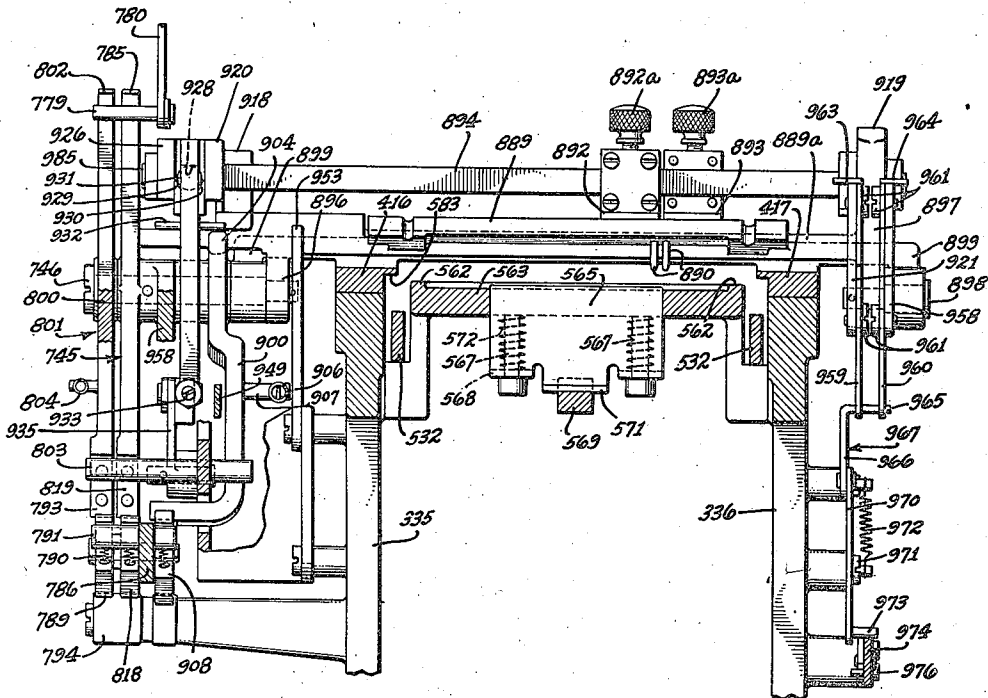


Fig. 87.

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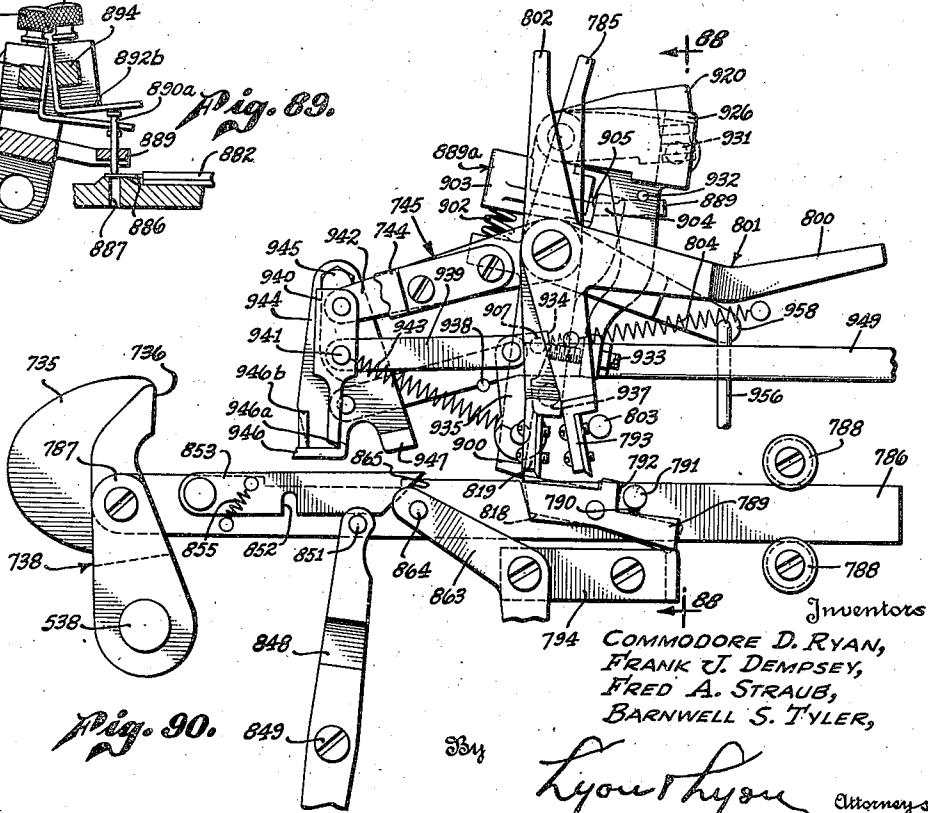
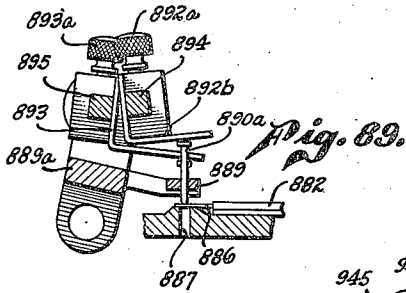
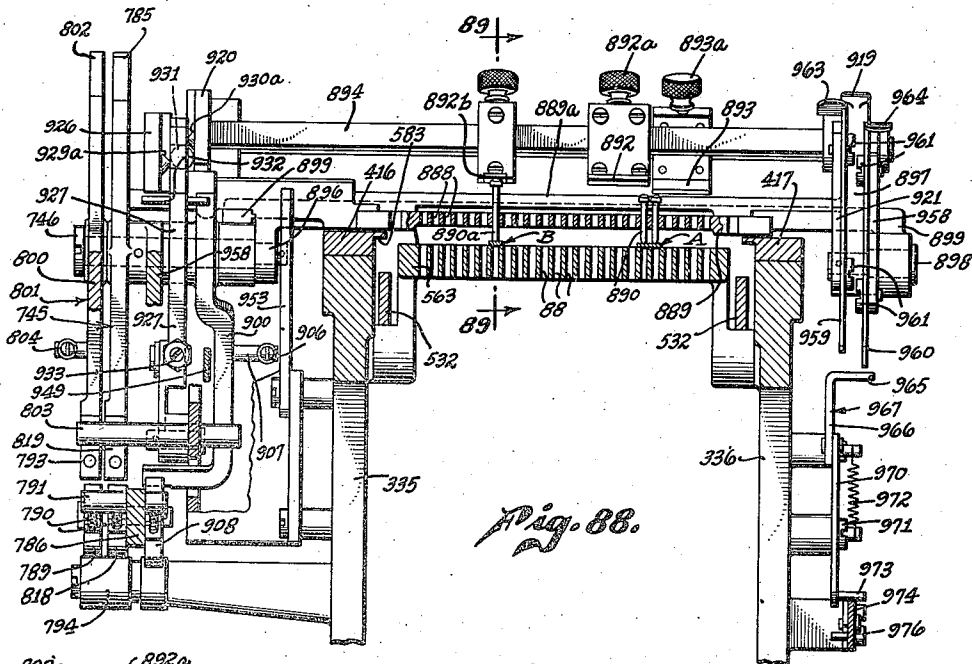
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UNITED STATES PATENT OFFICE

2,406,040

PRINTING MACHINE

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Application November 2, 1940, Serial No. 364,052

14 Claims. (Cl. 101—57)

1

This invention relates to printing machines of the addressing machine type; to a powerplant therefor; to means for feeding matter to be printed through a printing station; to means for feeding printing devices through the printing station; and to an extensive control system for coordinating the operation of the matter and devices-feeding means, powerplant, and printing machine.

One of the principal objects of this invention is to produce a machine of simple and sturdy design having an extensive range and variety of applications and uses and to a machine which may be easily and conveniently set up or adjusted to operate according to the particular requirement necessary to perform the selected application or use.

The printing machine of this invention is separable into two units, the first of which may include the driving mechanism, and will be referred to as the "powerplant," while the second unit may include the printing mechanism and will be referred to as the "addressor." This construction permits the powerplant to be utilized for driving other attachments, such, for example, as a postage printing device, which will be referred to as the "postage printer," and is a useful feature of the invention.

A further object is to provide a suitable table upon which the powerplant may be relatively fixedly mounted, and the addressor movably mounted, for easy movement to and from a position of attachment, in which the several elements of the addressor which are to be connected to the powerplant are inherently positioned in alignment with the related elements of the powerplant, and to further provide a unitary means for causing the several elements of the addressor to connect to their related powerplant elements, and also to provide means for automatically connecting the control system of the addressor with the control system of the powerplant when the addressor is moved into position of attachment.

A further object is to provide the table with manually operable control means to which the addressor control system will become automatically connected when moved into attachment position, and to provide means for rendering the manually operable control means inoperative when the addressor is moved out of its attaching position.

A further object is to provide the driving means of the powerplant with a two-speed driving mechanism, and for arranging the two-speed mechanism whereby when the addressor is con-

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nected to the power-plant it will be driven at one of said speeds and when another attachment is connected to the powerplant it will be driven at the other of said speeds.

A further object is to provide the powerplant with means for consecutively feeding envelopes, cards, or other matter to be printed, from a suitable receiving hopper; and for providing the addressor with a feeding means cooperating with the feeding means of the powerplant, for feeding the matter received therefrom to the printing station of the addressor, and for ejecting the matter from the printing station upon the completion of each printing operation.

A further object is to provide means for controlling the operation of the addressor automatically in response to the arrival of each piece of matter at the printing station.

A further object is to provide the addressor with a magazine for receiving a stack of printing devices, with means for intermittently feeding the printing devices to the printing station in consecutive order, and with a device-controlled means to render the printing and matter-feeding means inactive during any operating cycle of the machine in which a printing device is not located at the printing station, whereby each piece of matter fed to the printing station will receive an impression thereon from a printing device before being ejected therefrom.

A further object is to provide the addressor with a selector (for selecting certain of the printing devices for printing) while enabling the printing and matter-feeding means to skip certain devices which are not to be printed, whereby when the selector acts upon a printing device which is to be skipped the matter-feeding means will remain inactive during the passing of this device through the printing station, and, as a result thereof, the piece of matter will rest at the printing station until a printing device selected for printing is moved into the printing station and an impression taken therefrom.

A further object is to provide the addressor with a multicating mechanism for so controlling the devices-feeding means as to permit a number of impressions to be taken from each of the printing devices.

A further object is to provide a multicator which may be readily adjusted to change the number of impressions to be taken from each printing device.

A further object is to provide an inter-relation of control between the selector, devices-feeding means, and multicator whereby the multicator

will be rendered inactive by the selector for each printing device to be skipped and whereby the selector and devices-feeding means will be rendered inactive during the taking of multiple impressions from printing devices selected for printing.

A further object is to control the operation of the selector and multicating means by the devices-controlled means, whereby during each operation of the addressor in which a printing device is not located at the printing station the selector and multicating means will be rendered inoperative.

A further object is to provide a numbering device which may be adjusted either to print consecutive numbers upon consecutive pieces of the matter printed, whether or not multiple impressions are being taken from the printing devices; or to print the same number upon each of a series of multiple impressions, the number being changed only between each series of multiple impressions.

A further object is to control the numbering device from the devices-controlled means, whereby the numbering device will not be actuated during an operating cycle of the machine in which a printing device is not located at the printing station.

A further object is to interrelate the control means actuated by each piece of matter moved into the printing station and the devices-controlled means, whereby the addressor will be maintained inactive unless a piece of matter is located at the printing station, and whereby the matter-feeding means will be maintained inactive until a printing device is moved into printing position and the piece of matter located at the printing station has received an impression therefrom.

A further object is to subject the printing, selector, multicator, and numbering means to the dual control of the matter-controlled and the devices-controlled means.

A further object is to arrange the addressor so that the printing station may be moved transversely relative to the matter-feeding means, whereby the transverse location of the impressions printed upon the matter may be adjusted.

A further object is to provide a matter-control means which may be selectively located with relation to the printing station, whereby the longitudinal location of the impression printed upon the matter may be adjusted.

A further object is to arrange the controls upon a control board located in the front face of the addressor, whereby they are conveniently accessible.

A further object is to provide a practical and simple mechanism for delivering printing devices into a receiving drawer when ejected from the printing station.

A further purpose of the invention is to provide combinations of elements or of groups of elements and/or mechanisms operatively related for attaining the aforesaid objects and advantages, and also for attaining other objects and advantages which will become apparent from the following description and accompanying drawings, wherein is set forth one embodiment of the invention. It should be understood, however, that this particular embodiment of the invention is chosen principally for the purpose of exemplification, and that variations therefrom in details of construction or arrangement of parts may accordingly be made without departing from the spirit

and scope of the invention as the same is set forth in the appended claims.

In the drawings:

Fig. 1 is a perspective view of a printing machine in accordance with the invention. In this figure the addressor is shown connected to the power-plant for the printing of addresses, or other printing assignments, upon envelopes, cards, or the like;

Fig. 2 is a top plan view of the machine. This figure differs from Fig. 1, however, in that the addressor is shown separated from the power-plant, and further differs from Fig. 1 in that a postage printer is shown connected to the power-plant, whereby the powerplant with its connected postage printer may be operated to print postage stamps upon mail matter;

Fig. 3 is a top plan-view of the powerplant with its cover removed and shows the connecting portion of the addressor and the manner in which this portion of the addressor is connected to the powerplant.

Fig. 4 is an enlarged fragmental sectional view, taken substantially in the plane 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmental sectional view, taken substantially in the plane 5—5 of Fig. 3;

Fig. 6 is a sectional view, taken substantially in the plane 6—6 of Fig. 3;

Fig. 7 is an enlarged fragmental sectional view, taken substantially in the plane 7—7 of Fig. 2. A portion of the casing has been broken away to more clearly show the controls and the means for elevating the rear end of the powerplant;

Fig. 8 is an enlarged fragmental sectional view, taken substantially in the plane 8—8 of Fig. 4, illustrating in detail a portion of the two-speed driving mechanism;

Fig. 9 is a fragmental sectional view, taken substantially in the plane 9—9 of Fig. 8;

Fig. 10 is a fragmental sectional view, taken substantially in the plane 10—10 of Fig. 8;

Fig. 11 is an enlarged fragmental sectional view, taken substantially in the plane 11—11 of Fig. 3 and illustrates the connecting portion of the addressor coupled to the powerplant;

Fig. 12 is a view similar to Fig. 11, but differing therefrom in that it shows the connecting portion of the addressor uncoupled from the powerplant;

Fig. 13 is an enlarged fragmental sectional view, taken substantially in the plane 13—13 of Fig. 3, and illustrates in detail the driving clutch-controlling means and the powerplant elevating means;

Fig. 14 is a schematic representation of the control means for rendering the driving clutch inoperative unless the galley is in its operative position;

Fig. 14a is a schematic representation of the control means shown in Fig. 14, but differing from Fig. 14 in showing the manner in which the control means is actuated to render the driving clutch inoperative when the galley is out of its operative position;

Fig. 14b is an elevational view showing a fragmental portion of the apparatus of Fig. 14a to illustrate the manner in which the galley control means acts to prevent the driving clutch from being placed in operation even though a second control means is actuated in an endeavor to release the driving clutch;

Fig. 15 is a schematic representation of the major portion of the foot pedal-actuated control means for the addressor. The control means is shown in its inactive or retracted position;

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Fig. 15a is a view similar to Fig. 15, but differing therefrom in that the parts are illustrated in the position they would assume after having been actuated by the foot pedal to trip the driving clutch into action;

Fig. 16 is a fragmental plan view, partly in section, of the powerplant coupling device and the printer head portion of the addressor;

Fig. 17 is a schematic representation of the control means actuated by an envelope moving into printing position in the addressor, for tripping the driving clutch into operation;

Fig. 18 is a left side elevational view of the addressor, together with a portion of its supporting table in section;

Fig. 19 is an enlarged vertical sectional view of the safety connection in the driving mechanism for the printing plates-feeding device;

Fig. 20 is a left side elevational view of the addressor with the side casing removed;

Fig. 21 is a right side elevational view of the addressor with the side casing removed;

Fig. 22 is a fore and aft vertical sectional view through the addressor;

Fig. 23 is a horizontal section, taken substantially in the plane 23—23 of Fig. 21;

Fig. 24 is a side elevational view of the printing plates magazine, and shows the magazine tilted rearwardly with its doors open ready to receive a stack of printing plates;

Fig. 25 is a plan view of the magazine showing the magazine doors in their open position and a drawer full of printing plates, during the transfer of the printing plates from the drawer to the magazine;

Fig. 26 is a plan view of the magazine with the doors closed for confining the stack of printing plates within the magazine;

Fig. 27 is a rear view of the magazine in closed position;

Fig. 28 is a fragmental view of the rear, lower portion of the magazine, shown in its tilted position and with the doors open;

Fig. 29 is a fragmental right side view of the magazine with portions broken away to illustrate the manner in which the latch means for the magazine doors is automatically released during the swing of the magazine from its rearwardly tilted to its operative position;

Fig. 30 is a fragmental sectional view taken substantially in the plane 30—30 of Fig. 23;

Fig. 31 is a fragmental sectional view taken substantially in the plane 31—31 of Fig. 23;

Fig. 32 is a plan view, taken substantially in the plane 32—32 of Fig. 30, and shows a control lock which, as shown in this figure, has been automatically actuated to release the control mechanism by movement of the addressor into coupling position with respect to the powerplant;

Fig. 33 is a vertical sectional view, taken substantially in the plane 33—33 of Fig. 32;

Fig. 34 is a fragmental sectional view, taken substantially in the plane 34—34 of Fig. 16, showing the numbering device together with its setting and operating mechanisms. The parts are shown in the positions they assume at the beginning and end of an operation cycle;

Fig. 35 is a fragmental sectional view, taken substantially in the plane 35—35 of Fig. 34;

Fig. 36 is a fragmental view of a portion of the counter-actuating mechanism to show the position and relation of the parts when the machine has reached the halfway stage of its operating cycle;

Fig. 37 is a view similar to Fig. 34, but differ-

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ing therefrom in that it shows the positions and relations of the parts when the machine is two-thirds through its operating cycle, at which time the indexing or stepping-up of the numbering device takes place;

Fig. 38 is a plan view of the numbering device;

Fig. 39 is a section taken substantially in the plane 39—39 of Fig. 38;

Fig. 40 is a sectional view, taken substantially in the plane 40—40 of Fig. 38;

Fig. 41 is a sectional view, taken substantially in the plane 41—41 of Fig. 38;

Fig. 42 is a sectional view, taken substantially in the plane 42—42 of Fig. 38;

Fig. 43 is a plan view of the date and slogan printing plates mounted upon the numbering device;

Fig. 44 is a perspective view of the date and slogan printing plates;

Fig. 45 is a sample envelope upon which the name and address, date, number and trade slogan have been printed by the machine;

Fig. 46 is a fragmental view of an envelope upon which the number has been printed by the machine;

Fig. 47 is a fragmental view of an envelope upon which the date has been printed by the machine;

Fig. 48 is a left side view of the numbering device shown actuated to an intermediate position for the printing of data from an adapter plate;

Fig. 49 is a plan view of the adapter plate mounted upon the numbering device;

Fig. 50 is a sectional view, taken substantially in the plane 50—50 of Fig. 49;

Fig. 51 is a perspective view of the adapter plate;

Fig. 52 is a sectional view of the printer head, taken substantially in the plane 52—52 of Fig. 16;

Fig. 53 is a sectional view, taken substantially in the plane 53—53 of Fig. 52;

Fig. 54 is a sectional view, taken substantially in the plane 54—54 of Fig. 52;

Fig. 55 is a fragmentary, perspective view of the counter and counter-actuating means;

Fig. 56 is a fragmental plan view of the selector mechanism and illustrates it set to select printing plates provided with whole tabs;

Fig. 57 is a view similar to Fig. 56, but showing the arrangement of the selector when set to select printing plates having half tabs;

Fig. 58 is a view similar to Fig. 57, but showing the selector set to print a master classification and several subclassifications;

Fig. 59 is a view similar to Fig. 57, but showing the set-up of the selector bar when ten or more pins are to be used in the selector bar;

Fig. 60 is a skeleton view, showing the selector control means set to print full tabs, with the control means in its rest position;

Fig. 61 is a fragmental sectional view, taken substantially in the plane 61—61 of Fig. 56;

Fig. 62 is an enlarged view of a portion of the selector control means shown in Fig. 60, showing the parts in the positions they assume at the end of the first quarter of the operating cycle of the machine;

Fig. 62a is a fragmental sectional view, taken substantially in the plane 62a—62a of Fig. 62;

Fig. 63 is a view similar to Fig. 61 but showing the selector actuating head in the position it assumes at the end of the first quarter of the operating cycle of the machine;

Fig. 64 is a view similar to Fig. 62, but showing the parts in the positions they assume at the end of the first third of the operating cycle of the machine;

Fig. 64a is a fragmental sectional view, taken substantially in the plane 64a—64a of Fig. 64;

Fig. 65 is a view similar to Fig. 61, but showing the parts in the positions they assume at the end of the first third of the operating cycle of the machine;

Fig. 66 is a view similar to Fig. 64, but showing the manner in which a half tab will effect the operation of the selector control means to cause the printing means to skip the printing plate to which the half tab is attached;

Fig. 66a is a fragmental sectional view, taken substantially in the plane 66a—66a of Fig. 66;

Fig. 67 is a view similar to Fig. 65, but illustrating the manner in which the selector will act when a printing plate having a half tab is in the selecting station. The action of the selector as illustrated in this figure will cause the printing means to skip this printing plate when it is advanced into the printing station;

Fig. 68 is a view similar to Fig. 66, showing the selector control means set-up to cause the printer to skip those printing plates provided with certain tabs. The figure illustrates the position of the selector when the machine has advanced a third of its operating cycle;

Fig. 69 is a view similar to Fig. 66, but showing the selector control means in one-third cycle position, showing how the printing devices having no tabs are skipped. The selector control means of this figure has been set up to print from those printing plates having full tabs in a selected position;

Fig. 70 is a view similar to Fig. 67, but showing the action of the selector when the printing plate in the selecting station does not have tabs in a selected position. The parts of the selector are shown in the one-third cycle position;

Fig. 71 is a view similar to Fig. 69, illustrating the selector control means in rest position and set up to ring the signal bell each time a printing plate having a certain form of tab is acted upon by the selector;

Fig. 72 is a skeleton view showing the bell ringing mechanism at about one-third cycle, and shows how this mechanism is caused to operate when a printing plate having a thick, or bell-ring tab, is acted upon by the selector;

Fig. 73 is a view similar to Fig. 72, but showing how the bell-ring mechanism is actuated by a relatively thick half tab;

Fig. 74 is a view similar to Fig. 72, but showing how the bell-ring mechanism is prevented from ringing the bell when the selector acts upon printing plates having no tabs;

Fig. 75 is a view similar to Fig. 72, but showing how the bell-ring mechanism is prevented from ringing the bell when the selector acts upon a printing plate having a relatively thin tab;

Fig. 76 is a skeleton view showing the multiculator and selector in their rest positions, the multiculator being set to print three impressions;

Fig. 76a is a sectional view, taken substantially in the plane 76a—76a of Fig. 76;

Fig. 77 is a skeleton view showing the multiculator with the same setting as Fig. 76, at half cycle position of the third multiculator, the multiculator bar being tripped to permit it to return to its initial starting position;

Fig. 78 is a view similar to Fig. 77, showing the multiculator at one-third cycle to show how the se-

lector control means acts to trip the multiculator bar latch and thereby interrupt the operation of the multiculator when skipped printing plates are passing through the machine;

Fig. 79 is an enlarged sectional view, taken substantially in the plane 79—79 of Fig. 22;

Fig. 80 is an enlarged fragmental view of a portion of the apparatus of Fig. 79, showing in more detail the printing ribbon feeding and reversing mechanism;

Fig. 81 is a view similar to Fig. 80, but showing the ribbon feeding and reversing mechanism set to feed the ribbon in a direction opposite to that shown in Fig. 80;

Fig. 82 is a sectional view, taken substantially in the plane 82—82 of Fig. 84;

Fig. 83 is a sectional view, taken substantially in the plane 83—83 of Fig. 84;

Fig. 84 is a sectional view, taken substantially in the plane 84—84 of Fig. 83;

Fig. 85 is a plan view with portions thereof in section to show the feeding mechanism for the printing plates;

Fig. 86 is a sectional view, taken substantially in the plane 86—86 of Fig. 85;

Fig. 87 is a sectional view, taken substantially in the plane 87—87 of Fig. 62;

Fig. 88 is a view similar to Fig. 87, but showing an alternative construction, the section being taken approximately in the plane 88—88 of Fig. 90;

Fig. 89 is a detail, vertical section, taken substantially in the plane 89—89 of Fig. 88; and

Fig. 90 is a side elevation view, similar to that of Fig. 66, but showing the alternative construction of Fig. 88.

The printing machine disclosed, is separable into two units (Fig. 1), a powerplant 1 and an addressor 2. It will be understood, however, that the machine may be just as readily constructed as a single compact unit. In Fig. 1, the two units of the printing machine are illustrated as coupled together for normal operation, while in Fig. 2 the addressor is shown disconnected and moved away from the powerplant, thus permitting the powerplant to be employed for other services, such as, for example, driving a postage printer 3, which postage printer is shown connected to the powerplant in Fig. 2.

The addressor must be correctly aligned with the powerplant when these two units are coupled together, and as the addressor is of necessity a relatively heavy machine, too heavy in fact to be readily lifted into alignment with the powerplant, a bed plate 4 of suitable construction may be provided. The powerplant may be permanently located upon one end of the bed plate, while the addressor may be movably mounted upon the bed plate whereby it may be moved to or from the powerplant in such manner that when it is moved into coupling relation with the powerplant its connecting members and elements will correctly align with their related members and elements of the powerplant.

As illustrated in Fig. 1, the bed plate forms the top structure of a table 5, but, if preferred, the bed plate may be mounted upon the top surface of a suitable table, cabinet, or other appropriate structure.

A brief description setting forth the construction of the table will be given prior to the detailed description of the powerplant and addressor.

TABLE

The bed plate 4 (Fig. 1), which forms the top

surface of the table 5, is preferably fabricated from steel plates and angles, and is provided with four tubular supporting legs 6. A tubular cross brace 7 is welded to the lower ends of each pair of end legs, while a tubular longitudinal brace member 8 is welded to the cross braces intermediate their ends. This type of tubular supporting structure provides an inexpensive, light and sturdy support for the bed plate.

A cabinet 9 is mounted upon the left end of the bed plate (as viewed in Fig. 1). The cabinet extends across nearly the full width of, and about one-third of the length of, the bed plate. A powerplant supporting frame casting 10 (Figs. 1, 4, 5) is mounted on the rear half portion of the cabinet and fastened to the upper surface of the cabinet in any suitable manner, not shown. The remaining upper surface of the cabinet provides a convenient shelf and is covered with a corrugated rubber mat 11 (Figs. 1, 5). A drawer 12 is mounted in the cabinet and provides convenient space for the storage of tools and other accessories of the machine. The powerplant 1 is mounted upon the casting in a manner to be described later. By the arrangement just described the powerplant is supported at the correct height to be coupled to the addressor.

Track castings 13 (Figs. 22, 23) are appropriately mounted under that portion of the bed plate over which the addressor is adapted to be moved, to provide supporting and guiding means for rollers 16 of the addressor truck 14. (Fig. 21.)

A groove 15 is cut through the bed plate and into each of the track castings 13 to provide a runway for the addressor truck rollers 15 (Fig. 21). As may be observed in Figs. 1, 2, 21, 22, and 23, the track castings 13 and grooves 15 extend diagonally relative to the longitudinal center line of the base plate, and are spaced apart a suitable distance. It is desirable to so arrange the grooves in order that when the addressor is disconnected from the powerplant and moved to the right end of the bed plate, it will be simultaneously moved rearwardly a sufficient distance to be out of the way when using the powerplant with other attachments.

Between grooves 15 there is provided upon the top surface of the bed plate a T slot 17 (Figs. 21, 23) formed by two opposed undercut members 18 fastened to the bed plate in spaced relation by countersunk screws 19 (Fig. 23). Rectangular plates 20 (Figs. 21, 23) are slidably mounted in the T slot 17, and one of these plates is fastened to each side of the addressor truck by suitable bolt and spacer means, whereby plates 20 will be free to slide along the T slot but may not be lifted directly therefrom. The purpose of this arrangement is to prevent the addressor from being displaced from the bed plate should the table be inadvertently tilted. In other words, the addressor cannot escape from the bed plate, but has a limited amount of horizontal movement.

From the above description it will be appreciated that the powerplant is mounted upon the bed plate in a relatively fixed manner while the addressor is movably mounted thereon; however, this arrangement may be reversed, if found desirable.

Due to the mounting of the powerplant and addressor upon the bed plate as described, when the addressor is rolled into cooperative position with the powerplant, all of the parts and elements which are to be coupled to the powerplant will automatically align with their related parts and elements of the powerplant, thus permitting

the addressor to be quickly and easily conditioned for use. The attendant need only retract a single coupling handle carried by the addressor, roll the addressor into coupling relation with the powerplant, and then actuate the coupling handle, whereupon the addressor will be completely coupled to the powerplant. The manner in which the single coupling handle performs the coupling operation will be described later.

In some instances, it may be desirable to move the entire machine from one place to another, and for this purpose the table legs 6 may each be provided with a castor 21 (Fig. 1).

Other structural features and advantages obtained by use of the bed plate will be brought out in the description to follow of the powerplant, addressor, and control systems.

POWERPLANT

Of course it is to be understood that any form of type of powerplant may be substituted for the preferred form illustrated and described herein. The preferred form of powerplant chosen for the purpose of illustration and description, closely resembles that disclosed in United States Letters Patent to John Q. Finfrock, Numbers 1,988,036 and 2,005,778, dated January 15, 1935, and June 25, 1935, respectively.

The powerplant 1 includes, besides a driving mechanism 22 (Fig. 3) an envelope-feeding conveyor 23 (Figs. 1, 2, 3) for consecutively withdrawing envelopes, cards or other matter to be printed or treated from a suitable magazine 24 (Figs. 1, 2, 3) and conveying such envelopes past a moistening device 25. The driving mechanism may include suitable clutch means 26 for driving the envelope-feeding conveyor, and an attachment driving clutch 27 which may be driven at either of two speeds by a two-speed drive 28 (Fig. 3). The powerplant is also provided with a shift mechanism 29 for automatically causing the two-speed drive to operate in a predetermined manner when certain attachments are coupled to the powerplant. And, finally, the powerplant is provided with a master control mechanism which includes a conveyor clutch control mechanism 31 (Figs. 4, 5) and a driving clutch control mechanism 32 (Figs. 6, 13). The master control mechanism 30 extends to and includes the control mechanism of the attachment which may be coupled to the powerplant in a manner later to be described.

The powerplant 1 is arranged in the form of a compact self-contained unit. It has a framework 33 which includes a base casting 34, a front wall 35, an intermediate wall 36, and a rear wall 37. The base casting 34 is provided with an elevated attachment platform 38 located, as may be observed from Figs. 2, 3, along the right edge thereof between the front and intermediate walls. A crosswall 39 (Figs. 3, 4) is mounted along and above the inner side edge of the platform 38 and connects the front and intermediate walls. An appropriately formed cover 40 extends from one side edge of the powerplant to the other side edge, excepting for the attachment platform, where the cover engages the upper offset edge of the crosswall (Fig. 4), thereby leaving the platform 38 uncovered. The cover follows the contour of the front, intermediate and rear walls (Figs. 1, 2, 3, 4) whereby the major portion of the operating elements of the powerplant may be enclosed. A conveyor-supporting vertical plate 41 (Figs. 1, 3, 5) extends across the front face of the powerplant and forms with the powerplant

front wall 35 a channelway 42 in which the envelope-feeding conveyer 23 operates.

The remaining description of the powerplant framework will be given along with the description of the several elements supported upon or carried thereby.

Powerplant driving mechanism

The driving mechanism 22 (Fig. 3) includes an electric motor 43, a line shaft 44 (Figs. 5, 8), and means for transmitting the motive power from the electric motor to the line shaft which means may include a motor pulley 45, a line shaft pulley 46, and a driving belt 47.

Through the conveyer clutch means 26, the envelope-feeding conveyer 23 is releasably connected to the line shaft 44. The conveyer clutch is normally active for driving the conveyer unless rendered inactive by the control means in a manner to be described later.

The attachment driving shaft 48 (Figs. 3, 6, 13) is connectible to the line shaft 44 by means of the driving clutch 27 and the two-speed driving mechanism 28. The driving clutch 27 includes a driving member 49 (Figs. 3, 6, 13) journaled upon shaft 48, and a driven member 59 (Fig. 13) fixed upon shaft 48. Member 50 carries a clutch shoe 51 (Fig. 13) for engaging the clutch member 49 to establish a driving connection between the driving and driven members of the clutch. One end of the clutch shoe 51 is pivotally connected to member 50 by a pivot pin 52 while its opposite end is pivotally connected to a clutch-actuating lever 53 by means of a pivot pin 54, and the actuating lever 53 in turn is pivotally connected to the driven member 59 by a pin 50', as clearly shown in Fig. 13. The actuating lever 53 is yieldingly urged in a clockwise direction by a spring 55 to expand the clutch shoe into driving relation with the clutch-driving member 49. A trip lever 57 is provided to normally retain the clutch-actuating lever 53 in its retracted position, as shown in Fig. 13, but the trip lever may be actuated as shown in Fig. 15a to release the actuating lever and thereby engage the driving clutch. A further description of the tripping lever will be given along with the description of the attachment clutch control means 32 of which this lever forms an important part.

The clutch driving member 49 is provided with a pair of spaced chain sprockets 58 and 59 (Figs. 3, 6) preferably of the same diameter, which form a part of the two-speed drive 28. Driving chains 60 and 61 (Figs. 3, 6) connect sprockets 58 and 59 to a pair of line shaft sprockets 62 and 63 (Figs. 3, 8), respectively, to form two separate driving connections between the line shaft and the clutch driving member 49. As may be observed in Figs. 8, 9, 10, the sprockets 62 and 63 are journaled upon the line shaft 44. The sprocket 62 is the larger of the two sprockets and provides a high speed drive, while the smaller sprocket 63 provides a slow speed drive.

Sprocket 63 is journaled upon shaft 44 adjacent the inner side face of the line shaft pulley 46, and is operatively connected to the pulley by an over-running clutch whereby the sprocket may rotate at a higher speed than the pulley or at pulley speed. The over-running clutch may include a ratchet wheel 64 (Fig. 9) on sprocket 63 and a pawl 65 on the pulley wheel 46. The pawl is pivotally mounted upon the pulley by a suitable pivot pin 66, and is positioned to engage the teeth of the ratchet wheel 64 and drive the ratchet wheel in a clockwise direction (as viewed

in Fig. 9). The pawl 65 is yieldingly urged into engagement with the ratchet wheel by spring means 67.

It is desirable to provide means for lifting the pawl 65 from the ratchet wheel 64 when the sprocket wheel 63 is rotating at a higher speed than the pulley in order to eliminate such clicking noise as would otherwise be caused by the pawl snapping from one ratchet tooth to the next. For this purpose a lever arm 68 is journaled upon pivot pin 66 between the pawl 65 and the hub of the pulley and is securely fastened to the pawl by rivets 69 (Fig. 9). The lever arm 68 is provided with an arcuate head 70 (Fig. 9) adapted to nicely fit within a notch 71 formed in the edge of the friction disc 72 (Fig. 8). The friction disc is mounted upon the sprocket side face of the pulley hub by stop pins 73 (Fig. 8) and, as may be observed in Fig. 8, the friction disc is provided with arcuately formed slots into which the stop pins of the pulley extend. This arrangement permits the friction disc to be turned a limited extent before the stop pins will engage the ends of the slots. When the high speed sprocket is operatively connected to the line shaft 44 by means later to be described, the slow speed sprocket 63 will rotate at a higher speed than the pulley, and as a result thereof the friction disc will be rotated until the ends of its slots engage the stop pins. The motion of the friction disc as above described will be imparted to the lever arm 68 and through the lever arm to the pawl 65. The arm and pawl will be swung in a counterclockwise direction, as viewed in Fig. 9, until the free end of the pawl is lifted clear of the ratchet wheel 64, at which point the slots in the friction disc will engage the stop pins to maintain the pawl free of the ratchet wheel during such time as the high speed sprocket 62 is connected to the line shaft. When the high speed sprocket is disconnected from the line shaft, the pawl spring 67 will act to return the pawl into driving engagement with the ratchet wheel 64, thus automatically re-establishing a driving connection between the slow speed sprocket 63 and the line shaft pulley 46. The mechanism just described provides a simple and effective means for preventing the pawl from making a clicking noise as the ratchet wheel turns thereunder, as well as a simple and effective over-running clutch means, but it is to be understood that other suitable means may be substituted for the above means for accomplishing the purpose set forth.

The high speed sprocket 62 is releasably connected to the line shaft 44 by clutch means 74 (Figs. 8, 10). As will be remembered, this sprocket is journaled upon the line shaft 44 whereby the sprocket may rotate freely when disconnected from the shaft. Clutch means 74 includes a pair of driving pawls 75 (Fig. 10) on the inner side face of sprocket 62. The pawls are pivotally mounted upon the sprocket by pivot pins 76. A spring 77 (Fig. 10) acts between the sprocket and the tail end of each pawl, to yieldingly urge the pawls into driving relation with the ratchet teeth of a ratchet wheel 78 (Figs. 8, 10). Ratchet wheel 78 is fastened to the line shaft by any suitable means, as, for example, the taper pin 79 (Fig. 8). By reference to Fig. 10, it may be observed that rotation of the line shaft and ratchet wheel in a clockwise direction will, due to the relation of the ratchet teeth and pawls, drive the high speed sprocket in the same direction. Means are provided for selectively lifting

the driving pawls 75 clear of the ratchet wheel in order to disconnect the high speed sprocket, whereupon the over-running clutch of the slow speed sprocket will automatically act to drive the sprocket with the line shaft; thus either one or the other of the two sprockets will be connected to the line shaft and the driving clutch will be driven at either high or low speed.

For the purpose of lifting the pawls 75 clear of the ratchet wheel, each pawl is provided with a horizontally extending actuating pin 80 preferably located adjacent the nose end of the pawl. The free end of each of the pawl-actuating pins is suitably tapered to cam against a correspondingly tapered surface of a pawl-actuating cone 81 (Fig. 8). As may be noted in Fig. 8 the pawl-actuating cone is fastened upon one end of a sleeve 82, which sleeve is slidably journaled upon the line shaft. The opposite end of the sleeve is provided with a collar having an annular groove 83, by means of which the sleeve may be shifted longitudinally along the shaft to move the tapered cam surface of the pawl-actuating cone into engagement with the pawl-actuating pins and lift the driving pawls 75 clear of the teeth of the ratchet wheel. Movement of sleeve 82 to the left (as viewed in Fig. 8) will cause the high speed sprocket to be disconnected from the line shaft, whereas the return movement will release the driving pawls, permitting the springs 77 to return the pawls into driving engagement with the ratchet wheel, thus re-establishing the driving connection between the high speed sprocket and the line shaft.

The longitudinal movement of sleeve 82 is controlled by coupling means carried by certain of the attachments, whereby when these certain attachments are coupled to the powerplant the high speed sprocket clutch 74 will be automatically disconnected, whereupon the slow speed sprocket will become automatically connected to the line shaft for driving the driving clutch, and as a result thereof, these particular attachments will be driven at a slower speed than those attachments which, when coupled to the powerplant, do not actuate the high speed sprocket clutch.

The addressor is one attachment which is provided with coupling means operable for rendering the high speed sprocket clutch inactive. Referring to Fig. 8, there is shown a fragmental portion of the addressor coupling handle 84, pivotally mounted upon the addressor by pivot means 85 and having a cam groove 86 eccentrically arranged with relation to its pivot 85. When the addressor is moved into coupling position with the powerplant, the handle 84 should be positioned as shown in Fig. 8, and during the movement of the addressor into coupling position, one end of the cam groove 86 will ride over a shifter pin 87 (Figs. 2, 3, 4, 8) carried by a crosshead 88 (Figs. 3, 4, 8). The shifter pin projects horizontally from the crosshead and through a slot 89 in the powerplant crosswall 39, as may be observed in Figs. 2, 3, 4, 8, whereby during the positioning of the addressor into coupling relation with the powerplant, the shifter pin will enter the eccentric cam groove of the coupling handle. In this way an operative connection is established between the addressor coupling handle and the crosshead and the high speed sprocket clutch control means. The crosshead 88 is slidably journaled upon the conveyor clutch control shaft 90 (Figs. 3, 4, 8) and is normally, yieldingly forced against a stop collar 91

(Fig. 8) by a spring 92. Spring 92 encircles shaft 90 between one end of the crosshead and a spring collar 93. The stop collar 91 and spring collar 93 are fastened upon the shaft 90 in any appropriate manner. The cross head is provided with a downwardly extending arm 94, which arm at its lower extremity is provided with an arcuate yoke portion 95 (Figs. 4, 8) adapted to nicely fit into the annular groove 83 of sleeve 82. By the arrangement above described, the shifter pin, through the crosshead, is operatively connected to the high speed sprocket clutch-actuating sleeve 82. When the addressor coupling handle 84 is swung from the position shown in Fig. 8 to that of Fig. 5, for coupling the addressor to the powerplant, the eccentric cam groove 86 will travel over the shifter pin, and, due to the eccentricity of the groove, will shift pin 87 to the left, moving the pin from its rest position as shown in Fig. 8, to its shifted position, as shown in Fig. 5. This movement of the shifter pin will be transmitted through the crosshead to sleeve 82, and thus the actuating member carried by the sleeve will be moved sufficiently to the left, as viewed in Fig. 5, to lift the driving pawls 75 clear of the ratchet wheel teeth. When the coupling handle 84 is returned to uncouple the addressor, the parts will return to their initial starting position to again permit the high speed sprocket to be coupled to the line shaft; spring 92 will act to yieldingly retain the parts in their retracted positions, as shown in Fig. 8, thus maintaining the shifter pin 87 in position to enter the eccentric cam groove of the addressor.

Conveyer clutch

The driving mechanism of the powerplant is releasably connected to the envelope-feeding conveyer, by the conveyer clutch 26, most clearly illustrated in Figs. 3, 4, 5.

The conveyer clutch includes a driving wheel 96 (Fig. 4) fastened upon the line shaft 44, and a driven wheel 97 fastened upon a conveyer drive shaft 98. As may be observed in Fig. 4, the two wheels are coplanar and are positioned in spaced relation so that they may be brought into driving relation by means of a rubber-tired idler roller 99. The roller may be lifted to engage the peripheries of the two wheels as is shown in Fig. 4, or may be lowered to disengage them, by a mechanism now to be described.

The means for controlling the position of roller 99 includes a bracket arm 100 journaled upon the conveyer clutch-control shaft 90 from which arm the roller is suspended by a pair of links 101 (Figs. 4, 5). The portion of bracket arm 100 which is journaled upon control shaft 90 is bifurcated to accommodate between the bifurcations thereof a clutch-actuating lever 102 (Figs. 4, 5), which lever is securely keyed to the clutch-control shaft 90 and is yieldingly connected to the bracket arm 100 by an upwardly extending stud 103 (Fig. 4), fastened at its lower end to the bracket arm and extending freely through an enlarged bore 104 of the clutch-actuating lever, and having at its upper end of a pair of lock nuts 105. A compression spring 106 is mounted upon the stud 103 between the lock nuts and a washer engaging the top surface of the actuating lever 102. This provides a yielding connection between bracket arm 100 and actuating lever 102, which will normally act to yieldingly urge the rubber-tired roller 99 into driving engagement with the peripheries of wheels 96 and 97.

The clutch-actuating lever is provided with a

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screw 107 (Fig. 4) adapted to engage the free end of the bracket arm 100 when the actuating lever is rotated in a clockwise direction, and through this engagement to likewise swing the bracket arm in a clockwise direction, whereby the rubber-tire roller 99 will be lowered out of driving engagement with the peripheries of wheels 96 and 97, thereby bringing about the disengagement of the conveyer clutch.

It will be appreciated that a counterclockwise rotation of the clutch-control shaft 90 will, through the clutch-actuating lever 102 and its yielding connection with the bracket arm 100, elevate roller 99 into driving engagement with wheels 96 and 97 to re-establish the driving connection between the powerplant driving mechanism and the envelope-feeding conveyer. It is desirable to provide a brake for stopping the conveyer as soon as roller 99 is moved out of driving engagement with wheels 96 and 97, and for this purpose a brake lever 108 (Fig. 4) is journaled upon the powerplant front wall 35, by a pivot pin 109.

The brake lever overlies the conveyer driven pulley 97, and intermediate its ends it is provided with an arcuate section to which is fastened a suitable brake lining 110.

The brake lever is actuated from the clutch-actuating lever 102. To this end the lever has a contact screw 111, which screw is adjusted to engage the free end of the brake lever and to swing the brake lining 110 of the lever into braking relation with the periphery of the conveyer driven wheel 97 at about the same time that the clutch roller 99 is disengaged from the peripheries of wheels 96 and 97.

By this arrangement, the conveyer will be stopped upon the release of the conveyer clutch.

As will be observed in Figs. 4, 5, one of the roller links 101 is extended downwardly to engage a control lever 112 whereby the conveyer clutch may be disengaged independently of the lever 102.

The control lever 112 may be pivotally mounted upon the front wall 35 of the powerplant by a pivot screw 113 while the intermediate portion of the lever may extend through a guide slot 114 formed in a guide bracket 115. By this arrangement, the free end of the control lever may be actuated by the pin 116 which extends across the outer end of the bifurcated portion of lever 117 of the master control means. It will be appreciated therefore that the conveyer clutch may be rendered active or inactive by either lever 102 or lever 117, thus providing two separate control means for the conveyer clutch. Lever 117 is fastened upon shaft 118 of the master control means which will be described in detail later.

During the operation of the machine, it is necessary to render the conveyer clutch inactive when the attachment clutch is rendered active to drive an attachment for acting upon an envelope previously fed thereto by the conveyer. For this purpose a cam 119 (Figs. 3, 13) is fastened upon the driving shaft 48 for actuating the clutch-control means 31 to render the conveyer clutch inactive during the operation of the drive shaft.

A lever 120 (Figs. 3, 5, 13) is fastened upon the rear end of the clutch-control shaft 90 and carries a cam roller 121 between the bifurcated portions of its free end adapted to be yieldingly held in engagement with cam 119 by a spring 122.

In Fig. 13 cam 119 is shown in its normal rest position when the attachment clutch is inactive,

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as will be noted in this figure, the lift portion of the cam is in engagement with roller 121, whereby the lever 120 is maintained fully depressed. Lever 120 will maintain the clutch-control lever 102, which is likewise fastened upon shaft 90, in its elevated position, as illustrated in Fig. 4, whereby the rubber-tired roller 99 will be maintained in driving engagement with the clutch wheels 96 and 97, thus rendering the conveyer clutch active.

It will be noted that as soon as the lift portion of cam 119 has turned past the cam roller 121 during the initial rotation of the attachment clutch, that the lever 120 will, under the influence of its spring 122, swing upwardly in a counterclockwise direction (as viewed in Fig. 13) until the cam roller rides upon the concentric portion of the cam, which action will turn shaft 90 in a counterclockwise direction as viewed in Fig. 13, and in a clockwise direction as viewed in Fig. 4 as this figure is taken looking in the opposite direction. The clockwise movement of shaft 90 (as viewed in Fig. 4) will swing the clutch control lever 102 in the same direction, thus bringing its contact screw 107 into engagement with the bracket arm 100 whereby, through links 101, roller 99 will be disengaged from wheels 96 and 97.

The clockwise movement of control lever 102 will also apply the conveyer brake in the manner previously described.

From the above description it will be appreciated that as long as the low portion of cam 119 is engaging cam roller 121, the conveyer clutch will be rendered inactive and will only be returned to its active status upon the final rotation of drive shaft 48, during which time the lift portion of cam 119 will again engage the cam roller to return the parts to their initial positions.

It will now be appreciated that the envelope-feeding conveyer is normally maintained operatively connected to the powerplant driving mechanism, and is disconnected from the powerplant driving mechanism during substantially the entire rotation of the attachment clutch in each cycle of operation thereof, and at the completion of each cycle of operation of the attachment clutch, the conveyer will be again rendered active.

The envelope-feeding conveyer may be of any appropriate design for consecutively feeding envelopes, cards, or the like, to be treated from a suitable hopper to a station for treatment and after the treatment to eject it.

Envelope-feeding conveyer

The envelope-feeding conveyer chosen for the purpose of illustration, may include a drum 123 (Fig. 3) suitably keyed to shaft 98 between the front wall 35 and the conveyer supporting plate 41. Mounted parallel to shaft 98 and spaced to the left thereof is a countershaft 124, which shaft is supported by the powerplant walls 35 and 41, and journaled upon this shaft is a rubber-tired feeding drum 125 (Fig. 3) which drum is positioned directly below the forward end of the magazine 24, whereby envelopes placed in the magazine will be consecutively withdrawn therefrom and delivered to the conveyer drum 123.

The feeding drum 125 is driven from the conveyer drum 123 by a belt 126. A conveyer belt 127 loops about the forward end of the conveyer drum and extends parallel to the conveyer supporting plate 41 to the right hand end of the powerplant, as illustrated in Fig. 3, and there finally loops about a conveyer pulley 128.

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The intermediate portion of the run of the conveyer belt may be supported by a sealing roller 129 (Fig. 5).

A leading truck 130 (Figs. 1 to 5) is provided for weighing the envelopes down onto the conveyer belt for insuring their forward movement with the conveyer. As illustrated, the truck may be provided with two pairs of rubber-tired wheels 131. The leading set of wheels is arranged centrally with relation to the conveyer drum, and the outer wheel rides upon the top surface of the conveyer belt, while the inner wheel rides upon a rubber-tired surface of the drum having a diameter substantially equal to that of the conveyer belt at the point of engagement.

The trailing set of wheels may be so arranged that the outer wheel will ride upon the top surface of the conveyer belt directly above the outer end of the sealing roller 129 (Fig. 5) while the inner wheel will ride directly upon the rear end of the sealing roller. For this purpose, as may be observed in Fig. 5, the sealing roller is inclined and provided with suitable treads.

Of course, it will be understood that when envelopes are being conveyed through the machine, the wheels of the truck will ride thereover and press them down firmly upon the conveyer belt, drum and roller, to insure the forward progress of the envelopes during the operation of the conveyer.

In order to accommodate envelopes of different thicknesses, the leading truck is yieldingly positioned upon the conveyer. Thus, it may be provided with a pair of spaced pedestals 132 (Figs. 3, 5), each of which at its upper end is provided with an arcuate groove to receive a hold-down bar 133. As the bar closely fits the arcuate surface of the groove, the truck will be maintained in correct alignment with the conveyer.

As may be observed clearly in Fig. 3, the hold-down bar may be flanged adjacent the inner surface of each of the pedestals to prevent longitudinal displacement of the truck with relation thereto. The hold-down bar is operatively mounted upon the rear face of the powerplant front wall 35 by a pair of spaced lever arms 134, which arms extend through suitable slots provided in the wall and are pivotally mounted by means of a shaft 135 carried by the wall brackets 136 (Fig. 5). Each arm is provided with a suitable spring 137 (Figs. 3, 5) one end of which engages the arm while the other end may be adjustably positioned in one of the several notches formed in a spring comb 138 (Fig. 3) secured to and extending from the rear face of the powerplant front wall 35, whereby the pressure exerted by the hold-down bar upon the truck may be nicely adjusted.

During some operations of the machine, it is desirable to remove the leading truck from the conveyer, and for this purpose the hold-down bar may be raised against the action of its spring 137 to permit the removal, by means of a truck handle 139 (Fig. 3) of the truck from the conveyer. Lifting the hold-down bar into its raised position also renders the conveyer clutch inoperative because the conveyer is not used when the truck is removed.

To lock the hold-down bar in its elevated position and render the conveyer clutch inoperative, there are provided on the two hold-down lever arms 134, rearwardly extending portions 140 interconnected by a rod 141. Intermediate the ends of rod 141 there is journaled a swing link 142 (Fig. 5) having at its lower end a cam

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pin 143, which pin is adapted to travel along a hook-shaped cam piece 144 in such manner that when the hold-down bar is elevated to release the truck, the cam pin lodges under the hook-shaped portion 145 of the cam and thereby locks the hold-down bar in its elevated position.

To release the hold-down bar, it must first be raised sufficiently to cause the cam pin 143 to travel down an inclined cam surface 146 until the cam pin has moved beyond the control of the hook-shaped cam piece 144, whereupon the hold-down bar may be returned to its truck-engaging position, after which the cam pin 143 will travel along a guideway 147 and finally will be guided to its initial starting position by an upper inclined cam surface 148.

The conveyer clutch is rendered inactive during such time that the hold-down bar is in its elevated position by a radius link 149, which interconnects the shaft 135 and rod 141 adjacent the swing link 142, the radius link having intermediate its ends, a plunger 150 (Figs. 4, 5). The plunger 150 extends through a suitable bore formed in the clutch-actuating lever 102, and is thereby maintained in alignment with a pivot pin 101', which pin connects the links 101 to the bracket arm 100. When the hold-down bar is elevated, plunger 150 will be thrust downwardly against the pivot pin 101, and will thereby swing the bracket arm 100 in a clockwise direction (as viewed in Fig. 4), whereby the clutch roller 99 will be moved out of its driving engagement with the wheels 96 and 97 of the conveyer clutch, thereby rendering the clutch inactive.

Just beyond the leading truck 130, the conveyer is provided with a narrow truck 151 (Figs. 1, 2, 3, 5, 7). The narrow truck 151 is removably mounted upon the bearing portion 152 (Figs. 3, 5) of the forwardly extending bracket 153 mounted upon the powerplant front wall 35.

Referring to Figs. 1 and 7, it may be observed that the truck 151 has three rubber-tired wheels 154. The wheels do not show in Fig. 1, but the ends of the axles which support the wheels on the truck are shown at 155. The truck 151 has sufficient weight to maintain the envelopes being fed in contact with the conveyer belt 127.

A stripper 156 (Figs. 1, 2, 3) is provided to prevent more than one envelope at a time from being withdrawn from the magazine during the operation of the conveyer.

Referring to Fig. 3, the stripper includes a pair of spaced rubber-tired wheels 157 which are normally retained against rotation, and intermediate of the wheels there is a third wheel 158 having a metallic tread. The three wheels may be mounted as a unit assembly and spring-weighted into contact with the envelopes as they are fed from the magazine.

Between the rubber-tired wheels 157 and the metallic wheels 158, the stripper has a pair of yieldably mounted stripper feet 159 (Fig. 3) to further assist in the prevention of more than one envelope at a time from being withdrawn from the magazine by the conveyer.

Magazine

The magazine 24 includes a bottom plate 160, a rear, side plate 161 and a forward plate 162 (Fig. 3) all of which form a unit, and this unit is mounted upon the powerplant between the front wall 35 and the conveyer-supporting wall 41.

The front side of the hopper of the machine is closed by an adjustable front side plate 163 in order to accommodate envelopes of different

widths. Slidably mounted upon the bottom plate 160 of the magazine is a slider 164 adapted to include the envelopes placed in the hopper in order to cause them to assume a shingled relation to each other to facilitate one-at-a-time feeding of the envelopes from the magazine.

As may be observed in Figs. 1, 2, 3, the magazine is open at the top in order to permit envelopes or other matter to be readily piled therein.

Moistener

The powerplant is provided with a moistening device 25 (Figs. 1, 2, 3) which may be rendered active for opening the flaps of envelopes 165 (Figs. 2, 3) and for moistening the gummy surfaces of the envelope flaps during their passage from the magazine.

After the envelope flaps have been moistened, the sealing roller 129 will return the flaps into sealing relation with the bodies of the envelopes.

It will be understood that the machine may be used for sealing envelopes only, during which operation an attachment need not be mounted upon the powerplant.

The moistening means should be turned to its "on" position as illustrated in Fig. 2, and the envelopes placed in the magazine and the machine placed in operation, whereupon the envelopes will be consecutively withdrawn from the magazine and conveyed past the moistening and sealing means, and finally ejected from the machine in continuous operation.

The machine when sealing envelopes only, operates at a very rapid rate and a great number of envelopes may be sealed per hour.

The structural features of the moistener are not included in this invention and therefore will not be described in detail. However, one form of moistening means which may be incorporated in the machine is that fully disclosed in the application for United States Letters Patent, Serial No. 735,578, filed by John Q. Finrock on July 17, 1934.

Driving clutch-control means

The driving clutch-control means 32 forms one of the important elements of the master control means 30. The description of the driving clutch control means now to be given will be chiefly with reference to the control of the driving clutch by envelopes or other pieces of matter moved into a printing position by the powerplant conveyer, when attachments other than the addressor are coupled to the powerplant.

The driving clutch-control means, or adjustable trip mechanism as it is sometimes called, is substantially like that disclosed in the United States Letters Patent to Allen, No. 1,809,264, and therefore will be only briefly described herein.

Referring to Figs. 3, 4, 5, and 6, it will be observed that a trigger 166 extends under the attachment platform and into the conveyer channel 42, and at its forward end the trigger is bent upwardly at 167 to intercept the path of travel of the envelopes carried by the conveyer, whereby as each envelope is conveyed into printing position, it will engage the upturned end 167 of the trigger; and, through a mechanism to be described, will engage the driving clutch. The rear end of trigger 166 is secured in the forward end of a yoke piece 168. The open portion of the yoke piece straddles a pivot post 169 and is pivotally connected to the upper end of said post by a pin 170, and the pivot post is in turn piv-

otally mounted upon a pressed metal bracket 171 (Fig. 6).

Projecting rearwardly from the pivot post 169 is a trip finger 172 (Figs. 5, 6), and the rear portion of yoke piece 168, which overlies a portion of the trip finger, is provided with a spring comb 173 (Fig. 6), whereby a spring 174 may be adjustably positioned between the trip finger and the spring comb of the yoke piece. By this arrangement, the spring may be positioned closer to or farther away from the pivotal mounting of the yoke piece 168 to predetermine the amount of upward tension to be applied to the upturned portion 167 of the trigger.

The spring means 174 yieldingly maintains the upturned end of the trigger in the path of travel of the envelopes carried by the conveyer. The upturned end of the trigger is prevented from rising above a predetermined height, as shown in Fig. 6, by a cam guide 175 (Figs. 4, 5). The cam guide 175 is provided with an inclined cam surface 176 (Fig. 4), which acts to gradually depress the upturned end of the trigger as the trigger is swung with its pivot post 169 by the movement of an envelope into printing relation with an attachment mounted upon the powerplant. Further movement of the envelope causes the end of the trigger to drop below the leading edge of the envelope, whereupon it swings back under the envelope, and after the trailing edge of the envelope has passed the trigger end, the trigger swings upward to intercept the leading edge of the next envelope.

In order to return the trigger to its initial position just described, the pivot post is provided with a horizontally extending spring bracket 177 (Fig. 6) to which one end of a spring 178 is connected, while the opposite end of the spring is connected to a trigger swing frame 179 (Figs. 4, 6). One end of the trigger swing frame is pivoted to the powerplant base casting by a screw 180, and, as may be observed in Fig. 6, the pivotal center of the trigger swing frame is substantially in alignment with the point of engagement between the trigger finger 172 and a clutch tripping mechanism later to be described.

This arrangement permits the swing frame and trigger mechanism to be adjusted without affecting the actuation of the clutch tripping mechanism, whereby the upturned end 167 of the trigger may be properly located along the path of travel of the envelopes to engage the driving clutch and interrupt the action of the conveyer at the proper time to insure that each envelope will be brought to rest in predetermined position in the printing station.

As may be observed in Fig. 6, the forward end of the swing frame is bent upwardly at 181 to carry the cam guide 175 and the forward end of spring 178. As may be also observed in this figure, the pressed metal bracket 171 which supports the pivot post 169, is also mounted upon the swing frame; thus the entire trigger mechanism is operatively mounted upon the trigger frame and may be adjusted as a unit by adjusting the frame.

The trigger swing frame 179 may be adjusted to vary the position of the stamps printed upon the envelopes. In Fig. 4, the swing frame is illustrated in its normal position and from this position it may be shifted, by pulling outwardly upon a knob 182 mounted upon the outer end of the actuating rod 183, which rod extends through the casing 40 and at its inner end is securely fastened to the swing frame.

The tripping mechanism for the driving clutch includes the tripping lever 57 previously referred to and clearly illustrated in Figs. 6, 13 and 14.

Referring to Figs. 6 and 13, the tripping lever 57 is pivotally mounted upon a supporting member 184 by a screw 185. The supporting member is preferably mounted upon a formed metal bracket 186 in such manner as to provide for a limited amount of yield in order to take up the shock imparted to the tripping lever when disengaging the driving clutch.

The tripping lever supporting member 184, at its lower end, is provided with an enlarged transverse bore in which is mounted a rubber bushing 187 (Fig. 13) and through the bore of the bushing is a supporting pin 188, which pin connects the supporting member to the formed metal bracket 186, thus providing the resilient mounting formed between the support and bracket.

The upper end of the supporting member 184 is inwardly flanged as at 189, and the flanged portion thereof is provided with an elongated slot 190 (Fig. 3) to receive the upper end 191 of the formed metal bracket 186, thus providing a vertically slidable guiding connection between the upper ends of the supporting member and the formed metal bracket, whereby the jar transmitted to the bracket by the tripping lever when releasing the clutch will be absorbed by the rubber bushing 187.

Referring to Fig. 13, the supporting member 184 is provided with an eccentrically mounted stop disc 192 against which the tripping lever 57 is normally yieldingly maintained by a tension spring 193.

The stop disc 192 is eccentrically mounted upon the supporting member by a screw 194. By loosening the screw, the disc may be turned to align the tripping lever with the end of the driving clutch-actuating lever 53, in its rest position, and when so adjusted the disc may be securely clamped to the supporting member by the screw.

The stop disc is preferably made of fibre or other suitable resilient material which will act as a stop for the actuating lever without producing a metallic click.

Referring to Fig. 14, it will be observed that a tripping latch 195 is pivotally mounted upon the lower end of the tripping lever 57, that this latch is yieldingly urged counterclockwise by tension spring 196, and that the forward end of the tripping latch is provided with a hook portion 197 which hooks over the rear end of the trigger finger 172.

With the arrangement of the parts as just described, it will be appreciated that movement of the trigger by an envelope on the conveyor will actuate the trigger means, whereby the tail portion 172 thereof will move to the left (as viewed in Fig. 14) thereby engaging the hook portion 197 of the latch member, and, through engagement therewith, cause the trip lever 57 to be swung in a clockwise direction, thereby releasing the clutch-actuating lever 53 and permitting the clutch shoe 51 to expand into driving relation with the driving member 49 of the driving clutch, thus rendering the clutch active for driving such attachment as may be coupled thereto.

Fig. 14 also illustrates means for disconnecting the hook portion of the tripping latch 195 from the trigger finger 172 shortly after the driving clutch has been engaged, whereby even though the trigger means should be maintained in its actuated position, the clutch tripping lever 57

will return to its initial position for disengaging the clutch upon the completion of a single revolution. The means for disconnecting the latch from the trigger finger includes a drag link 198 connected at its upper end to the journal pin 199, which mounts the cam roller 121 upon the lever 120, while the lower end of the drag link is provided with a slot 200 for slidably engaging a pin 201 carried by the free end of the tripping latch.

By the means just described, as soon as the lift portion of cam 119 passes the cam roller 121, the lever 120 will be raised until the cam roller engages the low portion of cam 119.

This motion of the lever 120 is sufficient to lift the hook portion 197 of the tripping latch clear of the trigger finger 172, whereupon the tripping lever spring 193 returns the tripping lever to its initial position wherein it engages the stop disc 192, ready to be engaged by the clutch-actuating lever 53 to bring about the disengagement of the driving clutch upon the completion of the operating cycle of the machine.

Just prior to the release of the driving clutch, the lift portion of cam 119 will again engage cam roller 121, and will thereby return the drag link and tripping latch to their initial positions.

In the normal operation of the machine, the trigger 166 will be returned to its initial position (Fig. 14) during the operating cycle of the machine, and therefore upon the completion of the operating cycle the parts will be in position to again engage the driving clutch. If, however, for some reason the trigger is retained in its actuated position, the clutch will be disengaged in the manner above set forth, upon completion of its operating cycle, and if the trigger is released subsequent thereto, it will be free to return to its initial position. During the movement of the trigger to its initial position, the finger 172 of the trigger will engage the inclined surface of the hook portion of the tripping latch, and will thereby lift the latch sufficiently to permit the trigger to return.

The slot 200 is provided in the drag link 198 to permit the tripping latch to be lifted (for relatching) during the return movement of the trigger finger, while the link 198 is in lower position.

The means for disconnecting the clutch-tripping mechanism from the trigger is provided for use in connection with such attachment as the postage printer, which attachments are preferably equipped with a control meter for locking the attachments against further use when a predetermined amount of postage has been printed, whereby the driving clutch cannot be engaged to drive such attachments after they have become locked, and to thereby prevent injury to either the powerplant or attachments.

The disconnecting means 202 (Fig. 6) for the driving clutch-tripping mechanism may include a lifting finger 203 (Figs. 5, 6) having its free end arranged to underlie a horizontally projecting pin 204 carried by the side face of the tripping latch 195, while its opposite end is fixed to a crankshaft 205 (Figs. 6, 13) suitably journaled upon the powerplant. The crankshaft is provided with a crankarm 206 (Fig. 6) formed on its forward end, which crankarm is pivotally connected to the lower end of a stop button 207 having a head 208. The stop button is slidably mounted in a vertical hole 209 drilled through the attachment platform and the hole in turn is counter-bored at 210 at its upper end to receive the stop

button head 208. A torsional spring 211 is mounted on the crankshaft and is arranged to yieldingly urge the crankshaft to rotate in a clockwise direction (as viewed in Fig. 13) to thereby, through its crankarm, lift the head of the stop button above the floor of the attachment platform, and at the same time swing the finger 203 in a clockwise direction (as viewed in the same figure) to engage the tripping latchpin 204 and to thereby lift the hook portion 197 of the tripping lever latch clear of the plane of travel of the tripping finger 172 of the trigger mechanism, and in this way disconnect the driving clutch-tripping mechanism from the trigger, whereby the driving clutch cannot be rendered active by the trigger mechanism.

The locking system of the postage printer normally acts to hold the stop button 207 depressed and thereby maintain the stop finger 203 in its lower position, clear of the tripping latchpin 204, so that the tripping latch 195 is in lower position for engagement by the tripping finger 172 of the trigger mechanism.

When the attachment locking system functions to lock the attachment against further use, it will act simultaneously therewith to release the stop button, which, due to the action of the torsional spring 211, will lift the button, thereby permitting the lifting finger 203 to swing upwardly and disconnect the tripping latch 195 from the trigger finger 172, thereby disconnecting the trigger from the driving clutch-tripping mechanism.

The control meter of the attachment may be reset, whereupon the locking system thereof will function to depress the stop button 207, thereby reestablishing an operative connection between the trigger and the driving clutch-tripping mechanism.

Means are provided for securely locking each attachment to the powerplant platform, and unless the attachment is securely locked in position the driving clutch-tripping mechanism will be disconnected, preventing possible injury to the attachment and powerplant driving mechanisms.

To this end a second disconnecting means may include a finger 212 (Figs. 5, 6, 13) which is similar to finger 203, and, like finger 203, underlies the horizontal pin 204 of the tripping lever latch 195. One end of finger 212 is fastened to one end of a sleeve 213 (Figs. 6, 13), which sleeve is journaled upon the crankshaft 205. A cam lever 214, fastened to the other end of the sleeve, is yieldingly held in contact with a cam surface 215 (Fig. 6) of a reciprocatory cam 216 by a torsional spring 217.

With the reciprocatory cam 216 positioned as illustrated in Fig. 6, wherein the cam lever engages the low surface of the cam, finger 212 will be held clear of the tripping lever latchpin 204, but when the reciprocatory cam is moved rearwardly, the free end of the cam lever 214 will ride up onto the high level of the cam surface. This movement of the cam lever will in turn rotate sleeve 213, and will thereby swing the free end of finger 212 upwardly in a clockwise direction (as viewed in Fig. 13) and will thereby lift the tripping lever latch clear of the trigger finger, thus providing a second and independent means for disconnecting the driving clutch-tripping mechanism from the trigger.

An end 218 of the reciprocatory cam 216 is pivotally connected to a handle 219 (Figs. 3, 6) of the attachment locking means by a pin 220. These parts are so proportioned that as long as

the attachment lock remains in its unlocked position, the tripping mechanism will remain disconnected from the trigger, but upon the movement of the attachment lock into locking position the tripping mechanism will be automatically reconnected to the trigger.

It is desirable to automatically depress the stop button 207 whenever the attachment locking handle is swung to its unlocked position, and this result is easily accomplished by providing the reciprocatory cam 216 with an elongated slot 221 (Fig. 6) through which the button extends, and by forming a second cam surface 222 on the reciprocatory cam at a point so located as to bring this second cam surface into engagement with the end of the crankarm 206 when the locking handle is moved to its unlocked position, and to thereby automatically depress the crankarm and its connected button. The crankarm 206 will be released when the locking handle 219 is returned to its locking position.

From the above description it will be appreciated that the driving clutch-control mechanism is operated by each envelope moved into the printing station of the powerplant for engaging the driving clutch for driving an attachment mounted upon the powerplant through one complete operative cycle, and which, upon completion of the cycle, will disengage the driving clutch, whereupon the control means will automatically be reset, in condition to be actuated by the next succeeding envelope to again engage the driving clutch. It will also be apparent that the control mechanism includes means for rendering the clutch-control mechanism inoperative when the locking system of such attachments as the postage printer acts to lock such attachment against further use (as when the amount registered in the meter falls below a predetermined value); furthermore, the clutch-control means will be rendered inoperative to engage the driving clutch unless the attachment is locked in its operative position upon the powerplant; and, finally, the stop button 207 will be depressed each time the attachment-locking handle is swung to its unlocked position.

The driving clutch-control mechanism is provided with other means for engaging the driving clutch, which other means form a portion of the master control means of the machine, and will actuate in response to certain conditions set up in the addressor when the latter is coupled to the powerplant. Such means will be described in the description of the addressor control mechanism.

Manual disabling of trigger 166

As has been previously indicated, the trigger 166 serves to control the driving clutch in response to the passage of envelopes through the envelope-feeding conveyor 23. However, with some attachments, such as the addressor to be described in detail later, this trigger 166 is not used.

In order to incapacitate the trigger 166, a manual lockout is provided (Figs. 3, 4), which consists of a lever 223 fulcrumed by a screw 224 on the front wall 35 of the powerplant. The right end of lever 223 extends slightly beyond the right edge of the front wall 35 and is bent over to provide a thumbpiece 225 for manual manipulation. The left end of lever 223 extends across and above the trigger 166 so that when the thumbpiece 225 is lifted, the trigger 166 is depressed, below the plane of envelopes in the conveyor. A spring washer 226 compressed between the lever

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223 and the head of the screw 224 provides sufficient friction to retain the lever 223 in whichever position it is moved.

Powerplant tilting mechanism

In the particular machine disclosed, the powerplant is so designed, for the purpose of facilitating flow of water to the envelope-moistening device, that its base 34 is tilted at an angle with respect to the base of the addressor (to be described later). Thus, in Fig. 7, the powerplant is shown connected to a postage mailing machine, under which condition the right side (with reference to Fig. 7) of the powerplant is lower than the left side, instead of being at the same level. On the other hand, as shown in Fig. 6, the powerplant is positioned for alignment with the addressor (in which position the powerplant is substantially level). To permit movement between these two positions shown in Figs. 6 and 7, respectively, the powerplant frame casting 34 is attached at its front edge to the casting 10 by bolts 227 (Figs. 4 and 5) having resilient rubber washers 228 under their heads so as to permit limited oscillatory movement of the powerplant about its lower front edge as an axis.

To shift the powerplant between the lower and upper positions shown in Figs. 7, 6, respectively, a cam mechanism is employed. Thus there is provided a cam shaft 229 (Fig. 13) journaled in bearings provided in the side walls of the cabinet 9. The shaft projects through the side wall at one end and has an actuating crank 230 secured thereto. The shaft 229 has keyed thereto, adjacent its opposite end, a pair of identical cams 231. Each of these cams cooperates with a cam follower 232 secured to the powerplant base casting 34 and projects downwardly therefrom through apertures 233 in the casting 10. The powerplant is shifted between the lower and upper positions shown in Figs. 6 and 7, respectively, by rotation of the cam shaft 229 through approximately 90°. Thus, as shown in Fig. 5, the followers 232 rest on relatively high portions of the cams 231, whereas in the position shown in Fig. 7, the followers 232 rest on relatively low portions of the cams 231. To prevent any vibration of the cam shaft 229, leaf springs 234 are riveted to the rear wall of the cabinet, and press against the cam 231. Each of the followers 232 consists of a threaded shank having a head screwed thereon to permit accurate adjustment of the height of the powerplant.

Drive shaft coupling between powerplant and attachments

As has been previously described, the forward end of the attachment driving shaft 48 (Figs. 3, 6, 7) projects through the wall 35 and has mounted on its projecting end a coupling 235 which cooperates with a similar coupling on the attachment, which may be a postage meter, or the addressor. The coupling 235 includes a disc 235 having a transverse tongue 237 on its front face, which tongue engages a transverse groove 238 in a disc 239 on the cooperating coupling of the attachment when the attachment is moved into operative relation with the powerplant.

When the powerplant is in normal or neutral condition, as at the end of a cycle of operation, the mechanism always stops with the transverse tongue 237 extending vertically, which is the proper position for it to be in when an attachment is moved into or out of driving relation with the powerplant. With the tongue 237 in vertical

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position, the coupling 235 automatically engages with the coupling on the attachment when the two are moved together in a manner to be described later, in the description of the addressor.

Control of driving clutch in powerplant from the addressor

When the addressor is in operative relation with the powerplant, the driving clutch of the powerplant is placed under the control of the addressor. To this end two plungers 240 and 241 are slidably mounted for vertical movement in the bedplate 4 of the table. The upper ends of the plungers are substantially semispherical in shape and contain rollers 242. These plungers 240 and 241 are adapted to be depressed by cooperating elements on the addressor, which will be described later.

The rear plunger 241 is pivotally connected at its lower end to a substantially horizontal arm of a bellcrank lever 248 secured to a shaft 249 rotatably supported on the underside of the bedplate. The bellcrank lever 248 also has a downwardly extending arm, which has a pin 250 extending transversely therefrom into a slot 251 in the rear end of a link 252. This link 252 is connected to a pedal on the machine in a manner to be described later.

The shaft 249 has attached to its left end a rearwardly extending arm 253 which is pivotally connected to the lower end of a link rod 254. The upper end of link rod 254 is pivotally connected to the end of a substantially horizontally extending arm of a bellcrank lever 255 which is pinned to the shaft 118. Therefore, depression of the rear plunger 241 must result in the counterclockwise rocking of the shaft 118 (as viewed in Fig. 13). As previously described, shaft 118 is associated with the master control means of the powerplant. Rocking of this shaft 118 counterclockwise performs two functions: (1), it stops the envelope conveyer 23, as previously described under the title "Conveyer clutch"; and, (2), it engages the driving clutch 27.

Engagement of the driving clutch 27 is effected as follows:

Referring to Fig. 15, the rear plunger 241 is shown in elevated position, under which condition the bellcrank lever 255 is in extreme clockwise position. Bellcrank lever 255 has an upwardly extending arm 256, which pivotally supports, by a pin 257, an upwardly extending finger 258. Finger 258 is urged counterclockwise relative to arm 256 by a tension spring 259, to interconnect those two members. The finger 258 has a stop pin 260, which bears against the arm 256 and limits counterclockwise movement of the finger 258 relative to the arm 256.

In the position shown in Fig. 15, the finger 258 has no effect on the operation of the driving clutch. However, when the rear finger 241 is depressed, the bellcrank lever 255 is rocked counterclockwise into the position shown in Fig. 15a. This rocking of the bellcrank lever also rocks the finger 258, the spring 259 maintaining the pin 260 against the upwardly extending arm 256 of the bellcrank lever. The leftward movement of the upper end of the finger 258 swings it against a pin 264 on the tripping latch 195, and the continued movement of the finger carries the tripping latch leftward with it, into the position shown in Fig. 15a.

It is to be noted at this point that the spring 193 resists the leftward motion of the tripping latch 195, but is overpowered by the spring 259.

The leftward movement of the tripping latch

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195 swings the trip lever 57 to the right to engage the clutch, starting the machine on its cycle of operations.

In order to engage the clutch in the manner
aforesaid, it is only necessary to momentarily depress the rear plunger 241. Upon re-
lease of the plunger all the parts linked thereto-
are immediately restored to the position shown
in Fig. 15, in which the trip lever 57 is positioned
to disengage the clutch at the end of the cycle.

Pedal control

The rear plunger 241, in addition to being di-
rectly operable from the addressor by a mech-
anism that will be described in connection with
the addressor, is also adapted to be operated by
foot pedals on the machine. The plunger 241
can be actuated without simultaneously actu-
ating related controls in the addressor, by depres-
sion of a right pedal 261 (Fig. 1). The rear
plunger 241 and the related control element of the
addressor can be simultaneously depressed by a
left pedal 262.

Referring now to the mechanism interconnect-
ing the right pedal and the rear plunger 241, it
will be observed from Fig. 1 that depression of
the pedal 261 pulls a connecting rod 263 down-
wardly. The upper end of this rod 263 (Fig. 13)
connects to an arm 264 projecting forwardly from
and keyed to the right end of a shaft 265. On the
left end of this shaft 265 there is secured a down-
wardly depending arm 266, which (Fig. 7) is con-
nected by a rod 267 to the link 252. As has been
previously described, the link 252 has a slot 251
therein engaging a pin 250 in the lower arm of
the bellcrank lever 248, so that rearward move-
ment of the link 252 depresses the plunger 241.
The rod 267 is connected to the link 252 by a
compressible connection 268 to permit depres-
sion of the right pedal without actuation of the
plunger 241 when the latter is locked against
movement, in a manner to be described later. It
will be noted that depression of the pedal results
in counterclockwise rocking (with reference to
Fig. 7) of the shaft 265. It will be apparent from
Fig. 7 that the slot 251 in the link 252 will permit
the depression of the plunger 241 with simul-
taneous movement of the pedal 261. A spring
269 (Fig. 13) connected between the frame and
the rod 263, normally maintains the right pedal
in upper position.

The left pedal 262 is connected to the lower
end of a rod 270 (Fig. 1) and the upper end of
this rod (Fig. 13) is connected to a forwardly
extending arm 271 secured to a shaft 272 jour-
naled in bearing brackets on the underside of the
bedplate (as is also shaft 265). It will be appar-
ent, therefore, that depression of the left pedal
262 will result in clockwise rotation of the shaft
272 (with reference to Fig. 15). Rigidly secured
to the left end of shaft 272 (Fig. 13) is a down-
wardly depending arm 273 which (Fig. 5) has its
lower end pivotally connected to a link 274 piv-
otally connected at its rear end to the down-
wardly depending arm of a bellcrank lever 275
pivotally supported on the shaft 276 supported
in brackets on the underside of the bedplate. The
bellcrank lever 275 has a forwardly extending
arm pivotally connected to the lower end of a
slide 277, which slide extends upwardly through
an aperture provided therefor in the bedplate
immediately to the left (Fig. 13) of the rear
plunger 241. The slide extends upwardly to a
level slightly above the top of the plunger 241
(Fig. 7) and has a roller 278 secured to the side

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thereof adjacent the plunger 241 so that the roller
partially overlies the plunger for a purpose to be
described later.

It may be stated here briefly that depression of
the left pedal results in the depression of the
slide 277 and causes the roller 278 thereon to
engage an element of the addressor which in turn
bears against the plunger 241 so that both the
plunger and the aforementioned element of the
addressor are depressed.

Interlocks between addressor and powerplant

The rear plunger 241 is adapted, when de-
pressed, to engage the driving clutch. The front
plunger 240 is adapted, when depressed, to pre-
vent the operation of the driving clutch. Plunger
240 forms a part of an interlock to prevent en-
gagement of the driving clutch when certain ele-
ments in the addressor are not in proper operat-
ing condition.

The rear plunger 241 and the slide 277 are
intended to be used only when an addressor is
operably connected to the powerplant. To this
end, an interlock is provided to positively prevent
depression of the plunger 241 unless the addressor
is positioned in coupling relation with the power-
plant.

This interlock includes a lever 279 (Fig. 32)
which lies in a horizontal plane directly on top of
the bedplate of the table, immediately back of
and to the right of the plunger 241 and is secured
to the upper end of a shaft 280 which extends
down through the bedplate and has secured to its
lower end, a very short distance below the bed-
plate, an arm 281. The shaft 280 is rotatably
supported in a bushing 282 in the bedplate (Fig.
33) and a torsion spring 283 constantly urges the
arm 281, shaft 280 and arm 279 clockwise (with
reference to Fig. 32). The force exerted by the
spring 283 normally maintains the end of arm
281 in engagement with a groove in the plunger
241, and the bushing which slidably supports the
plunger 241 so that the plunger is locked against
vertical movement.

As shown in Fig. 32, the arm 279 has been
rocked counterclockwise by an abutting member
284 on the frame of the addressor, the latter hav-
ing been moved into operative relation with the
powerplant, so that the arm 281 is disengaged
from the plunger 241 and the latter is free to
move.

When the addressor is moved away from the
power plant into inoperative position, as shown
in Fig. 2, the lever 279 is restored by its torsion
spring to the position shown in Fig. 2, in which
the rocking arm 281 engages the plunger 241
and locks it.

The interlock just described is particularly de-
sirable when a mailing device is to be used with
the powerplant at times when the addressor is
not in use, because if it were possible for the
plunger 241 to be depressed while the mailing
machine was in use, accidental depression of the
left pedal might result in accidental operation of
the postage machine, and waste postage.

The front plunger 240, as previously indicated,
forms a part of an interlock between the addressor
and the powerplant for preventing engagement of
the driving clutch when the addressor is in cer-
tain condition. This plunger 240 (Fig. 7) is piv-
otally connected at its lower end to a crankarm
243 on a shaft 244 (Fig. 13), which shaft is rotat-
ably supported by brackets secured to the under-
side of the bedplate of the table, and carries on
its opposite end a crankarm 245 which is pivotally

connected to the lower end of a link rod 246. Therefore depression of the front plunger 240 depresses the link rod 246. The upper end of link rod 246 is pivotally connected to a substantially horizontal arm 247 of a bellcrank lever 285 (Fig. 14). This bellcrank lever 285 also has a substantially vertically extending arm 286 and a horizontally extending arm 287 which extends in a direction approximately opposite to the arm 247. In the position shown in Fig. 14, the arm 287 rests against an adjustable stop screw 288 which limits counterclockwise rocking of the bellcrank lever. The bellcrank lever is urged into the position shown in Fig. 14 by a tension spring 289. When the plunger 240 is depressed, the bellcrank lever 285 is rocked clockwise (with reference to Fig. 14) against the pull of spring 289, bringing the arm 286 against the pin 260 on finger 258, thereby preventing leftward movement of the finger 258, in response to pull thereon by the spring 259 when the bellcrank lever arm 256 is rocked counterclockwise.

When the plunger 240 is depressed, the finger 258 is prevented from moving to shift the tripping latch 195 to engage the driving clutch. The parts are shown in this particular position in Fig. 14b, in which the spring 259 has yielded to permit counterclockwise rocking of the bellcrank lever arm 256 without corresponding movement of the finger 258.

Electrical actuation of drive clutch from addressor

In addition to the controls described above, for controlling the powerplant from the addressor through the plunger 241, an additional electrical clutch-tripping mechanism is provided. This control comprises a switch mechanism in the addressor, and a solenoid-actuated mechanism in the powerplant.

Thus referring to Fig. 17, the electrical control system comprises as its main elements a switch 289 located in the addressor, and a solenoid mechanism 290 located in the powerplant and connected to the switch 289 and to the electrical supply line which energizes the driving motor 43 of the powerplant by suitable leads. The switch 289 is in series with the source and the solenoid mechanism 290 so as to control the operation of the latter.

The switch 289 comprises a casing 291 containing a pair of contacts 292 and 293 which are connected to leads 294 and 295, respectively. An arm 296 is pivotally supported below the contact 293 so that when the arm is rocked counterclockwise, it forces the contact 293 against contact 292 to complete the circuit. The arm 296 has connected thereto a spring arm 297 which projects from the casing 291 and is adapted to be actuated by a mechanism in the addressor, later to be described. A tension spring 298 normally maintains the arms 296 and 297 in lowermost position, as shown in Fig. 17, under which conditions the circuit is open. The mounting of the switch case in the addressor and the actuation of the arm 297 by the addressor mechanism, will be described in the description of the addressor.

The lead 295 extends from one contact of the switch 289 to one side 299 of the main supply line, through the main motor switch 300, so that the electrical control circuit is closed to energize the motor 43 only when the switch 300 is closed. The other lead 294 extending from the switch 289 connects (in the powerplant) to the armature 301 of a relay 302, and when the relay is de-ener-

gized its armature closes on a back contact 303, which is connected to one terminal of a solenoid 304. The other terminal of the solenoid is connected directly to the other side 305 of the main supply line, so that closure of the switch 289 (it being assumed that the main switch 300 has been previously closed) completes the circuit from the supply line through the solenoid 304. The latter is thereupon energized, pulling its plunger 306 and actuating a mechanism to be described later. The movement of the plunger 306 causes it to strike the armature 301 of the relay 302, moving the armature away from its back contact 303 and causing it to close on its front contact 307, thereby interrupting the circuit through the solenoid 304 but completing a circuit through the relay 302. Energization of the relay causes it to hold its armature 301 against the front contact 307 as long as the switch 289 remains closed. The movement of the armature 301 away from the contact 303 broke the circuit to the solenoid 304, and so long as the relay 302 is energized the solenoid 304 is prevented from being reenergized. The mechanism described insures that the solenoid will be only momentarily energized long enough to pull its plunger, after which the plunger is released, regardless of the duration of closure with the switch 289. However, when the switch 289 does open, it releases the relay 302, whereupon the armature 301 again closes on its back contact 303, restoring the circuit to normal condition ready for actuation in response to the next closure of the switch 289. A condenser 308 is preferably connected in shunt to the armature 301 and its back contact 303, to reduce sparking between those contacts when the inductive circuit of the solenoid 304 is interrupted.

Still referring to Fig. 17, plunger 306 of the solenoid is connected by a pivot pin 309 to the left end of a slide plate 310, so that when the plunger moves to the left the plate 310 moves with it. The slide plate 310 is supported in a suitable groove in a bracket 311. The tension spring 312 is interposed between the left end of slide plate 310 and the bracket 311, to normally urge the plate 310 and solenoid plunger 306 to the right into the normal position shown in Fig. 17. Rightward movement is limited by engagement of a stop shoulder 313 on the plate 310 against the bracket 311.

The upper edge of the plate 310 is so shaped as to define a shoulder 314 which, when the plate is moved to the left, engages the pin 204 on the tripping latch 195 and carries the latter to the left into the position shown in Fig. 15a, which disengages the trip lever 57 from the clutch-actuating lever 53, to engage the clutch.

As previously described, the solenoid is energized only momentarily, so that the spring 312 immediately retracts the plate 310 and restores the trip lever 57 back into normal position, to disengage the clutch at the end of the cycle.

It is important to note that it is impossible to engage the main drive clutch for operation through more than one cycle in response to closure of the switch 289.

Summary of functions of powerplant control elements

The functions of the various powerplant control elements may be outlined as follows:

1. Hold-down bar 133, when engaging the leading truck 130, performs the ultimate function of engaging the conveyor clutch 26 to feed envelopes from magazine 24.

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2. Lever 223, when raised, performs the ultimate function of incapacitating the mechanism for stopping envelopes in the postage-printing position, thereby causing them to be fed into the addressor.

3. Closure of the main switch 300 starts the motor, and subsequent closure of the switch 289 in the addressor engages the driving clutch 27 to drive the addressor mechanism. Engagement of the driving clutch automatically disengages the conveyer clutch 26, to interrupt the feeding of envelopes to the addressor.

4. Rocking of the lever 219 to the forward position performs the ultimate function of locking the addressor to the powerplant. The details of operation of the locking mechanism will be described later.

5. Leftward rocking movement of the interlocking lever 279 unlocks the rear plunger 241 so that it can be depressed.

6. Depression of the rear plunger 241 performs the ultimate function of engaging the driving clutch.

7. Depression of the front plunger 240 takes the driving clutch out of the control of the rear plunger 241.

8. Depression of the right pedal 261 depresses the rear plunger 241 (if it is unlocked).

9. Depression of the left pedal 262 depresses the slide 277, which, in turn, simultaneously depresses a shoe 777 on the addressor, to be described later, and (through the said shoe 777), the rear plunger 241.

From the foregoing, it will be observed that the addressor can be selectively conditioned for either manual or automatic operations, as follows:

When it is desired to operate the addressor automatically, the leading truck 130 is secured in position by means of the hold-down bar 133, which then causes the engagement of the conveyer clutch 26, conditioning the conveyer 23 to automatically feed envelopes from the magazine 24. The lever 223 is raised to incapacitate the mechanism that would normally stop the envelopes in the postage-printing position, thereby causing the conveyor to feed the envelopes into the addressor.

After the foregoing operations have been performed, the addressor is brought into coupling position with the powerplant, and the main switch 300 is closed, starting the motor. Thereafter the envelope-actuated switch 289 in the addressor controls the driving clutch which, in turn, controls the conveyer clutch.

To operate the machine manually, the driving clutch is tripped, by actuation of the rear plunger 241 either by a device on the addressor (which will be described later) or by depression of one of the foot pedals 261 or 262.

The front push button 240 is actuated, under certain conditions, by apparatus in the addressor to be described later, to take the driving clutch out of the control of the rear plunger 241.

ADDRESSOR

As has been previously indicated, the addressor mechanism includes a truck 14 (Fig. 21) having rollers 16 operating in grooves 15 in the bedplate and the track castings 13 of the table, and also has rectangular plates 20 operating in the T slot 17 of the bedplate for guiding the addressor on the table in a straight path to and from the powerplant.

Mounted on the truck 14 is the main frame 315 of the addressor. This main frame includes a

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base 316 which is slidably mounted on the truck 14 for fore and aft movement with respect thereto. Thus the base has a plurality of downwardly extending bosses 317, the lower ends of which slidably rest upon the truck 14 (Figs. 23 and 30). Each of these bosses 317 is drilled and tapped to receive a shouldered screw 318 which is screwed into the boss from the underside. These bolts extend through slots 319 in the truck 14 and the shoulders 320 of the screws are slidably fitted in the slot so as to guide the addressor frame for straight line movement fore and aft with respect to the truck.

To adjust the addressor fore and aft, and to lock it in a desired position of adjustment, a lever 321 (Figs. 23 and 31) is pivotally secured at one end to the underside of the truck 14, as by a pivot screw 322. This lever 321 extends across the truck and beyond the right edge thereof (with reference to Fig. 23) and has rotatably mounted on its free end a pinion 323, which engages an arcuate rack 324 rigidly secured to the truck 14.

Referring now to Fig. 31, the pinion 323 is journaled on a stub shaft 325 anchored to and extending upwardly from the lever 321. The pinion 323 is partly enclosed in a housing 326 attached to the lever 321, the housing having an aperture in the upper end through which the stub shaft 325 extends. The aperture is substantially larger than the shaft and receives a short hub extending upwardly from the pinion 323, which hub is slotted to receive dogs 327 on the lower face of a hand knob 328 also rotatably mounted on the stub shaft 325. It will be apparent that rotation of the knob 328 rotates the pinion 323. To lock the pinion to the knob against rotation, a locknut 329 is threaded onto the upper end of the shaft 325 so that it can be screwed down tightly against the knob 328, locking the latter against rotation. The nut 329 preferably has a knurled cylindrical outer surface and can be locked against complete removal from the shaft 325 by a setscrew 330 which projects into an annular recess 331 in the threaded portion of the shaft 325.

Referring to Figs. 23 and 31, the frame base 316 of the addressor has secured thereto a downwardly depending pin 332 which projects through a fore and aft slot 333 in the truck 14 and into a laterally extending slot 334 (from right to left of the machine) in the lever 321. It will be apparent, therefore, that in response to swinging movement of the lever 321 about its fulcrum 322, the side of the slot 334 in the lever engages the pin 332 and shifts the addressor frame forwardly or rearwardly according to the direction in which the lever 321 is swung. The slot 334 in the lever permits linear movement of the carriage in response to the swinging motion of the lever.

The addressor main frame 315 comprises as its main elements, in addition to the base 316, a pair of upright skeleton side members 335 and 336, respectively, between and on which members most of the apparatus is mounted, and these members will be referred to later in describing the apparatus mounted thereon.

Mounted on the front end of the left frame member 336 is a control panel 337 (Fig. 1) and positioned between the frame members 335 and 336, is a galley 338 for receiving used printing plates. Positioned above the frame members 335 and 336 is a printing head 339 and positioned rearwardly of the printing head is a plate magazine 340. Positioning of other elements of the

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machine will be pointed out in the detailed description of the various elements to follow.

As previously pointed out in the description of the drive shaft coupling between the powerplant and attachments, the coupling member 235 of the powerplant is adapted to be engaged with, or disengaged from, the cooperating disc 239 on the coupling of the addressor. Referring now to Fig. 16, the coupling disc 239 is secured to the projecting end of a sleeve 341 which is slidably mounted for both longitudinal and rotary motion in a bushing 342 in the rear wall of a U-shaped frame member 344, which frame member is mounted for fore and aft movement in a manner to be described later.

The sleeve 341 is slidably keyed to a shaft 345 which projects into and is rotatably supported at the rear end by the sleeve 341. Referring now to Fig. 12, the shaft 345 is rotatably and axially supported at its forward end in a journal in the front wall member 346 of the U-shaped frame member 344. Thus the shaft 345 has a shoulder 347 which abuts against the inner face of the bearing, and has a screw 348 screwed into its outer end, the head of which screw bears against the outer end of the bearing.

The sleeve 341 is shifted axially along the shaft 345 to engage or disengage the coupling disc 239 to or from the cooperating coupling 235, which shifting movement of the sleeve is effected by movement of the lever 84 (Fig. 1).

Referring to Figs. 11 and 12, the lever 84 is secured to the left end of a shaft 349, which is journaled in bearings 350 in bearing standards rising from the base of the U-shaped frame member 344. The shaft 349 has secured thereto a crankarm 351 having a crankpin 352 adapted to engage a seat 353 on a link 354, which link is pivotally connected adjacent its rear end by a pin 355 to a lever 356. Lever 356 is fulcrumed adjacent its lower end to the base of the U-shaped frame member by a pin 357, and has at its upper end a pin 358 bearing a roller 359 which rides in an annular groove 360 in the sleeve 341. A tension spring 361 urges the link 354 rearwardly, and, when the link is not controlled by the crankpin 352, its rearward movement is limited by contact of the rear end of the link with a stop 362 on the rear wall of the U-shaped frame member. The front end of the link 354 has a downwardly and rearwardly extending arm having a slot 363 which slidably engages the shaft 349, which functions to vertically support the forward end of the link.

When the handle 84 is in rearward position, as shown in Fig. 11, the link 354 is not engaged by the crankpin 352, but rests against the stop 362, in which position the sleeve 341 is in rearward position and the coupling disc 239 thereon is in position for engagement with the coupling disc 235 of the powerplant. When the handle 84 is rocked into forward position, as shown in Fig. 12, the crankpin 352 carries the link 354 forwardly and moves the sleeve 341 and the disc 239 out of engagement with the coupling disc of the powerplant.

The shaft 349 has a segment 364 secured thereto which segment cooperates with a spring ball detent 365 mounted in the base of the U-shaped frame member 344. This segment 364 has a depression 366 which is engaged by the ball detent when the handle 84 is in forward position, as shown in Fig. 12, to yieldably retain the handle in forward position against the force exerted by the tension spring 361.

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The handle 84, in addition to its function of shifting the addressor coupling disc 239, performs the additional functions of (1), locking the addressor to the powerplant, and, (2), coupling the addressor conveyor mechanism to the powerplant conveyor mechanism.

The locking mechanism includes a segment 367 (Figs. 11 and 12) having a spirally directed cam slot 368 therein, which engages a follower pin 369. This follower pin 369 is pivotally connected on opposite sides of the cam segment 367 to the inner ends of a pair of oppositely extending levers 370 and 371. Both levers are fulcrumed intermediate their ends on pivot members 372 and 373, respectively, secured to the base of the U-shaped frame member. The rearwardly extending lever 370 is pivotally secured (by a pin and slot connection) at its rear end to a plunger 374 slidably supported in the base 344 of the U-shaped member, and the front lever 371 is connected at its forward end (also by a pin and slot connection) to a front plunger 375 likewise vertically slidable in the base of the U-shaped frame member. When the handle 84 is in forward position, as shown in Fig. 12, the plungers 374 and 375 are retracted upwardly so that their lower ends are substantially flush with the lower surface of the base of the U-shaped frame member, whereas when the handle 84 is in rearward position, as shown in Fig. 11, the plungers are projected substantially below the base of the frame member. These plungers 374 and 375 cooperate with apertures 376 and 377, respectively, in the attachment platform 38 of the powerplant, so that when the plungers are in lower position, as shown in Fig. 11, they enter the apertures 376 and 377 and positively lock the addressor against movement away from the powerplant.

In order to positively prevent accidental disengagement of the plungers 374 and 375 of the addressor from the apertures in the attachment platform of the powerplant, a locking means is provided. This locking means includes annular grooves 378 adjacent the lower ends of the plungers 374 and 375, which annular grooves are adapted to be engaged by the opposite ends of a lock lever 379 pivotally mounted by a pivot screw 380 on the underside of the powerplant attachment platform 38. This lever 379 is integral with the lever 219, previously referred to. The outer end of the lever 219 has an aperture 381 therein, which is adapted to be engaged by a downwardly projecting arm 382 of a bellcrank lever 383 secured to the extreme right end of the shaft 349, to which the handle 84 is connected. This arm 382 is so positioned laterally on the addressor that when the addressor is in coupling position with the powerplant, the arm is aligned with the aperture 381 in the lever 219. When the handle 84 is in forward position, as shown in Fig. 12, the arm 382 is swung rearwardly and upwardly above the level of the lever 219, but as the handle 84 is swung rearwardly into the position of Fig. 11, the arm 382 swings downwardly and forwardly into the aperture 381 in the lever 219, and the final movement of the handle 84 and the arm 382 rocks the lever 219 to shift the ends of the lock lever 379 into engagement with the annular grooves 378 of the plungers 376 and 377, thereby locking the plungers against retraction.

As previously indicated, the handle 84 also controls the coupling of the conveyor of the addressor to the conveyor of the powerplant, so that they are driven in synchronism when the addressor is locked to the powerplant. Referring

to Fig. 3, it will be observed that when the addressor is coupled to the powerplant, the right end of the powerplant conveyer belt 127 is juxtaposed to and positioned immediately in front of the left end of the addressor conveyer belt 384. It will also be observed that the pulley 128, which supports the forward end of the powerplant conveyer belt 127, is juxtaposed to a pulley 385 on the addressor which supports the left end of the addressor conveyer belt 384. These two pulleys 128 and 385 are adapted to be coupled together by a coupling mechanism now to be described.

This coupling mechanism includes a hub 386 on the pulley 128, which hub has a diametrical slot therein adapted to receive a pair of diametrically opposite dogs 387 on a sleeve 388 slidably mounted on a hub 389 on the pulley 385. The dogs 387 are adapted to project through notches provided therefor in a flange 390 fixed to the end of the hub 389, which flange limits outward movement of the sleeve 388 and also provides a driving connection between the hub 389 and the dogs 387. As clearly shown in Fig. 11, the pulley 385 is rotatably mounted on a stub shaft 391 secured to a bracket on the U-shaped frame member 344.

The sleeve 388 is constantly urged toward outer position, in which the dogs 387 engage the diametrical groove in the hub 386 (Fig. 3), by a compression spring 392 compressed between the pulley 385 and the sleeve 388. This is the position the sleeve occupies when the powerplant and addressor are locked together (as shown in Figs. 11 and 3), and the handle 84 is in rearward position. When the handle 84 is moved into forward position, the sleeve 388 is retracted into the position shown in Fig. 12 by a mechanism now to be described. This mechanism includes a slide bar 393 supported for fore and aft horizontal sliding movement by screws 394 which extend through longitudinal slots 395 in the slide bar into the base of the U-shaped frame member. At its forward end, the slide bar has a pin 396 mounting a roller 397 which extends into an annular groove 398 in the sleeve 388. The rear end of the slide bar 393 has a pin 399 in the path of movement of a second arm 400 of the bellcrank lever 383 mounted on the shaft 349, which shaft is directly connected to the handle 84. In response to movement of the handle 84 into full forward position, the arm 400 of the bellcrank lever engages the pin on the slide bar 393 to shift the latter rearwardly and cause the roller 397 on the forward end of the slide bar to shift the sleeve 388 rearwardly and carry the dogs 387 into retracted position out of the diametrical groove in the hub 386.

Summarizing, the addressor is moved into coupling position with respect to the powerplant with the handle 84 in forward position, as shown in Fig. 12, after which the handle is swung into the rearward position shown in Fig. 11. This rearward movement of the handle 84 performs the following functions: (1), it shifts the grooved disc 239 (Fig. 11) on the addressor into engagement with the tongued disc 235 on the power unit; (2), it shifts the dogs 387 on the addressor conveyer pulley into engagement with the grooves in the hub 386 on the power unit conveyer; (3), it shifts the locking plungers 374 and 375 into the apertures in the attachment platform 38 of the pulley unit; (4), it swings the locking lever 379 of the power unit into locking engagement with the annular grooves in the locking plungers 376 and 377; (5), as previously described in connection with the description of the power unit, the rear-

ward movement of the handle 84 also shifts the pin 87 (Fig. 5) rearwardly to condition the two-speed drive of the power unit to drive the main drive shaft 48 of the power unit at the low speed.

Referring to Fig. 3, the splined shaft 345 extends through a hub 401 of a bevel gear 402 with which it is in rotary driving relation, but axial sliding relation. The hub 401 is slidably supported in a bearing bracket 403 (Fig. 16) which is connected to the main frame work of the addressor. The hub is restrained against axial movement with respect to the bearing bracket 403 by a collar 404 secured to the hub. The bevel gear 402 constantly meshes with a bevel gear 405 secured to the spring end of a main addressor drive shaft 406 which is supported for rotation in suitable bearings 407 and 408, in the addressor frame. It will be observed that the splined connection between the gear hub 401 and the shaft 345 permits fore and aft movement of the gear 402 (with the addressor frame) without corresponding movement of the U-shaped frame member 344. This relative movement between the U-shaped frame member and the main addressor frame is provided for the purpose of permitting fore and aft movement of the main addressor mechanism relative to the conveyer belt 384, and the mechanism which supports and drives this belt. (The conveyer belt 384 being non-shiftable with respect to the U-shaped frame member 344.)

As has been already stated, when the addressor is in operation and is in coupled relation with the powerplant, the U-shaped frame member 344 is locked to the powerplant attachment platform 38. However, aside from this locking connection between the U-shaped frame member and the powerplant, the U-shaped frame member is supported from the addressor frame member bracket 403, and in order to permit the fore and aft movement of the addressor with respect to the U-shaped frame member, a sliding supporting connection is provided between the bracket 403 and the U-shaped member 344. This sliding support includes a slide rod 448 rigidly secured to and extending between the rear wall 343 and the front wall 346 of the U-shaped frame member, which rod extends through and is slidably fitted in bearings 449 and 450 in the bracket member 403. The slide rod 448 and the splined shaft 345 of the U-shaped frame member, cooperating with the bearing supports in the bracket 403, provide a support between the U-shaped frame member and the addressor frame which maintains the U-shaped frame member in proper vertical position when the addressor is moved out of coupling relation with the powerplant.

Furthermore the mechanism for supporting and driving the addressor conveyer belt 384 is slidably supported relative to the main addressor frame, so as to permit free fore and aft movement of the main addressor mechanism, including the printing head thereon, without corresponding movement of the conveyer mechanism and envelopes carried thereby below the printing head. This permits adjustment of the main addressor mechanism fore and aft, by the knob 328 (Fig. 2), as previously described, to shift the printing head relative to envelopes on the addressor conveyer so as to vary the position of the printing on the envelope.

As already indicated, the entire addressor conveyer system is supported for relative fore and aft movement with respect to the addressor frame. This conveyer system comprises, in ad-

dition to the conveyer belt 384, and the main conveyer drive pulley 385, an upper right conveyer pulley 409 (Figs. 1 and 79) a lower right conveyer pulley 410 and a lower left conveyer pulley 411, all three of which pulleys are idler pulleys.

As previously described, the upper left (main drive) pulley 385 is mounted on the U-shaped frame member 344, which remains stationary during fore and aft movement of the addressor, by virtue of the fact that member 344 is locked to the powerplant attachment platform. The upper right conveyer pulley 409 is slidably mounted on a shaft 412 which shaft is supported at its front and rear ends in a bracket 413 attached to the right side frame member 336 of the addressor so that it can remain stationary during fore and aft movement of the addressor frame. The two lower conveyer pulleys 410 and 411 are rotatably supported by stationary brackets 414 secured to the truck 14, which, as previously indicated, remains stationary during fore and aft movement of the addressor.

Intermediate the two upper conveyer pulleys 409 and 385 the conveyer belt is slidably supported by a thin belt track 415, which track is slidably supported upon a pair of horizontal slide plates 416 and 417 attached to the left side and right side of the addressor frame members. The belt track 415 has upwardly projecting ears 418 adapted to engage the edges of the belt and maintain the belt track in alignment with the belt at all times.

It will be apparent from the foregoing description that the conveyer belt, its driving pulleys and the belt track can remain stationary while the addressor is shifted forwardly or rearwardly, the upper right pulley 409 sliding on its supporting shaft 412 and the belt track 415 sliding on the slide members 416 and 417 secured to the addressor frame.

In order to maintain envelopes in driven relation with the addressor conveyer belt 384, a row of idler pressure rolls 419 is positioned above the belt. These rolls 419 are supported in an elongated inverted channel member 420 (Fig. 21). Thus each of the rolls 419 is rotatably supported in a yoke 421 (Fig. 79) by a shaft 422 and each yoke is pivotally mounted in the channel member 420 by a shaft 423 extending between opposite sides of the channel member. Each roll is urged downwardly against envelopes on the conveyer belt by its own weight and that of its yoke plus the force exerted by a compression spring 424 compressed between the swinging end of the yoke and the top wall of the channel member. To limit the range of swinging movement of each yoke with respect to the channel member, each roll shaft 422 is extended beyond its yoke into a vertical slot 425 in the rear wall of the channel member.

The channel member 420 is demountably supported near its right end by a pin 426 projecting forwardly from the right end of an elongated arm 427, and the left end of the channel member 420 is similarly supported by a pin 428 projecting forwardly from the left end of this arm 427. The sides of the channel member 420 have notches 429 therein which slidably engage the annular grooves 430 on the pins 426 and 428 to lock the channel member against fore and aft displacement with respect to the pins. To yieldably retain the channel member in engagement with the pins, the channel member is provided with downwardly projecting leaf springs 431, the

lower ends of which are inturned and snap over the pins 426 and 428 when the channel member is pressed downwardly onto the pins.

The elongated arm 427 is detachably secured in rigid relation to the U-shaped frame member 344. Thus a pair of pins 432 and 433, respectively, project from the U-shaped frame member to the right into cooperating longitudinal holes in the left end of the arm 427. To detachably lock the arm on the pins, the pin 433 is provided with an arcuate recess 434 adapted to be engaged by a lock pin 435 rotatably mounted in a transverse hole 436 in the arm 427. The lock pin 435 also has an arcuate recess 437 which forms a continuation of the wall of the hole and receives the pin 433 when the lock pin is in one position of rotation with respect to the drill hole, to permit movement of the elongated arm into or out of position engaging the pins 432 and 433. When the elongated arm is in position, rotation of the lock pin 435 causes it to project into the recess in the pin 433, thereby locking the elongated arm rigidly to the U-shaped frame member 344.

The right end of the elongated arm 427 has a downwardly projecting slotted plate member 438 engaging an annular recess in a projecting hub 439 on the upper right conveyer pulley 409, which retains the pulley 409 and the right end of the elongated arm 427 in fixed relative fore and aft positions.

Mounted on the elongated arm 427 and extending parallel thereto, and immediately in front of the arm, is an envelope-supporting rail 440.

When the machine is in operation, envelopes are carried by the addressor conveyer belt 384 into position below the printer head 339 (Fig. 1) and as each envelope reaches printing position the conveyer must be stopped to permit the printing operation to take place. To this end, a mechanism is provided for automatically stopping the conveyer and actuating the printing mechanism in response to the movement of an envelope into printing position. This mechanism includes the switch 289 previously referred to in connection with the description of the powerplant, and which functions to energize the solenoid in the powerplant to engage the driving clutch. As has been previously described, the engagement of the driving clutch automatically disengages the conveyer clutch to stop the envelope during the printing operation.

The switch 289 is adjustably supported by the elongated arm 427. Thus referring to Fig. 21, a switch-supporting bar 441 is positioned in spaced relation above the elongated arm 427 and attached at its opposite ends to the arm by screws 442. The switch-supporting bar 441 is rectangular in cross section and extends through a rectangular aperture in the switch 289. Referring to Fig. 17, this rectangular aperture in the switch is formed by a channel in the upper surface of a switch frame block 443, and a switch supporting plate 444 which extends across and is secured to the block 443. A setscrew 445 is threaded in a bushing secured to the switch-supporting plate 444 so that by tightening the screw the switch can be locked in any desired longitudinal position on the switch-supporting bar 441.

As has been previously described in connection with the powerplant, the switch contact 293 is adapted to be moved into contact with the contact 292 by an arm 296 having attached thereto a leaf spring 297. The free end of the leaf spring 297 is curved downwardly into the path of envelopes moving along the conveyer belt 384, and as

each envelope reaches the spring 297 it rocks it upwardly to close the contacts of the switch. In order to provide a suitable support for the envelopes as they pass under the leaf spring 297, an envelope-supporting rail 440 is provided immediately below the leaf 297. This rail 440 extends parallel to and is positioned just back of the conveyer belt and is secured to and supported by the elongated arm 427. As clearly shown in Fig. 17, the free end of the leaf 297 normally extends below the top of the rail 440, and to permit this the end of the leaf 297 is bifurcated, the bifurcations straddling the rail 440. The rail 440 is of sufficient length to underlie the end of the leaf 297 in all positions of adjustment of the switch 289 along the switch-supporting bar 441.

The leads 294 and 295 (Fig. 17) are constituted by a flexible cable extending from the switch 289 to the powerplant, to maintain the electrical connection in all positions of the addressor with respect to the powerplant and of the switch with respect to the switch-supporting bar 441.

PRINTING APPARATUS

The printing head 339 (Fig. 1) includes a printing head bracket 452 which is rigidly connected to the left side frame member 335 of the addressor frame, and slidably supports a printing platen 453 for vertical reciprocation. This platen is normally in an upper position, as shown in Fig. 1, but during a printing operation it moves downward to press an envelope that has been moved into what will be hereinafter referred to as the "printing station" (Fig. 22), against an inking ribbon 454 which overlies an embossed printing plate 455c. The mechanism for handling the printing plates will be described later.

The inking ribbon 454 extends between a left printing reel 456 and a right printing reel 457. These reels appear in reverse positions in Figs. 80 to 83, inclusive, which views are taken looking at the rear of the machine. The ribbon passes upwardly from the reel 456 under the lower end of a ribbon guide shoe 458, thence upwardly alongside the ribbon guide plate and over the upper end thereof, thence horizontally under the printing platen and over a ribbon guide shoe 459, and thence onto the right reel 457. A mechanism is provided for automatically feeding the ribbon from one reel to the other, which mechanism will be described later.

The printing platen 453 is detachably mounted on a platen bracket 460 which in turn is slidably mounted on the printing head bracket 452.

The printing platen 453 consists of a rigid, elongated metal plate of appreciable thickness (Figs. 52, 53, 54), having on its underside a rubber cushion 461 having two embossed or raised pressure areas, one of which is relatively large and serves to press a portion of the envelope against a printing plate 455 and the other of which is relatively small and is longitudinally spaced from the first, for pressing another portion of the envelope against numbering type, to be described later.

To detachably mount the platen 453 on the lower end of the platen block 460, the platen is provided with a pair of dove-tailed grooves 465 in its upper surface which grooves extend forwardly from the rear edge of the platen. These dove-tailed grooves are engaged by dove-tail buttons 462 on the lower end of the platen block, so that the platen can be attached to or removed from

the platen block by sliding it rearwardly and forwardly, respectively. To yieldably retain the platen in position of attachment on the platen block, the lower face of the latter is provided with a projecting pin 463 which, when the platen is in position, engages against a shoulder defined by the edge of a recess 464 in the platen, thereby preventing forward movement of the platen relative to the platen block. Rearward movement of the platen with respect to the platen block is limited by engagement of the dove-tail buttons 462 with the forward ends of the dove-tailed grooves 465.

To insure snug engagement of the platen against the platen block, the dove-tail buttons 462 are spring mounted. Thus referring to Fig. 52, each button 462 has secured thereto a pin 466 extending up through a hole in a detachable plate 467 screwed to the lower end of the platen block proper. The upper end of the hole through which the pin 466 extends is counterbored and receives a compression spring 468 which is compressed between a head on the pin 466 and the lower end of the counterbore.

The springs 468 permit the platen to be forcibly rocked downward at the forward edge far enough to disengage the pin 463 from the cooperating shoulder in the platen, thereby allowing the platen to be pulled forwardly away from the platen block when it is desired to remove it.

The platen block 460 is positioned against the forward face of the printing head bracket 452 and is guided for vertical sliding movement therealong by a dove-tailed tongue 469 on the rear face of the platen block and a cooperating dove-tailed groove in the front face of the platen bracket (Fig. 16).

The platen block is constantly urged downwardly by a compression spring 470 mounted in a recess within the platen block (Figs. 16, 53) and compressed between the bottom wall of the recess in the platen block and the head of a nut 471 on an adjusting screw 472, the upper end of the screw extending up through the top wall of the printing head bracket and having a thumbpiece on its upper end. The head of the nut 471 is square and one edge thereof bears against a downwardly depending stop plate 473, which prevents rotation of the nut. The compression spring 470 determines the printing pressure, which can be varied by turning the adjusting screw 472.

The platen block 460 is normally raised clear of envelopes on the conveyer, against the force of the spring 470, by a mechanism acting through a lever 474. This lever 474 is fulcrumed near its center by a pin 475 in the printing head bracket (Fig. 16). The right end of the lever 474 has a forwardly projecting stud pin 476 which is fitted in a horizontal slot in a plate 477 screwed to the rear face of the platen block 460. The left end of lever 474 (the right end, as shown in Fig. 52), has a flat upper face against which a rounded bearing member 478 on the forward end of a lever 479, bears.

Referring now to Fig. 34, the lever 479 is fulcrumed by a pin 480 to the printing head bracket 452 and the rear end (rearwardly of the fulcrum point) overlies a cam 481. As shown in Fig. 55, the lever 479 is in the form of an inverted channel member, and has mounted within its channel immediately above the cam 481 a follower block 482, against which the cam rests.

A full rotation of the cam 481 raises and suddenly releases the rear end of the lever 479. Such

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operation is apparent from observation of Fig. 34 in which it will be observed that the forward edge of the follower block 482 is substantially in alignment with the center of the cam 481. The cam 481 is fixed to the right end of the main addressor drive shaft 406, previously mentioned (Fig. 16), so that it rotates whenever the main drive shaft is rotated.

As the rear end of the lever 479 is raised by the cam 481, the forward end of the lever depresses the left end (the right end with reference to Fig. 52) of the lever 474, to raise the platen block and compress the compression spring 470. Then, if the mechanisms to be described later do not intervene, when the cam 481 passes from under the follower block 482, the levers 479 and 474 are suddenly released to permit the compression spring 470 to drive the platen block and the platen downward to perform a printing operation.

It will be observed from the foregoing description that the force with which the printing platen drives envelopes against a printing plate is determined by the strength of the compression spring 470. Also, as previously described, the force exerted by this spring can be adjusted by turning the adjusting screw 472. However, it is found desirable to provide additional means for adapting the machine for the proper printing of both thick and thin envelopes. This additional means consists of a snubber spring 483 (Fig. 52) which is secured to the lower end of an adjusting screw 484 which extends through and is threaded in the upper wall of the printing head bracket and has a knurled thumbpiece on its upper end. The spring 483 is relatively stiff and its lower end is clear of the forward end of the lever 479 when the printing platen is in raised position. However, the clearance between the spring and the lever is such that the lower end of the spring engages the lever when the platen is near the lower end of its maximum permissible travel. Furthermore, the exact position of the platen at which the snubber spring 483 is brought into action is delicately adjusted by the screw 484 so that the snubber spring has substantially no effect on the operation of the platen when it encounters a thick envelope, but has a very noticeable effect in controlling the limit of downward travel of the platen and the pressure exerted by the platen, when it acts on a thin envelope. With a given adjustment of the screw 484, the machine will handle envelopes of thickness varying within relatively liberal limits, but if envelopes of thickness beyond such limits are to be addressed, then it may be necessary to readjust the screw 484.

Counter

The machine is equipped with an automatic counter 485 (Fig. 1) for the purpose of keeping a count of every envelope or other article that is printed by the machine. To this end the counter is operatively connected to the lever 479 so that every time this lever moves to actuate the printing platen downward to print an envelope, it simultaneously actuates the counter 485.

Referring now to Fig. 55, the rear end of the lever 479 is pivotally connected to the lower end of a link 486, the upper end of which link is pivotally connected to an arm 487 on a shaft 488 rotatably supported in the walls of the printing head bracket 452. On the left end of this shaft 488 there is an arm 489 having rotatably connected to its free end a finger 490, which, when in normal position, underlies the actuating lever 491

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of a counting device 485 of standard construction, well-known in the art. Each time the lever 491 is raised, the counter registers. It will be apparent that each time the rear end of the lever 479 moves downward to permit actuation of the printing platen, the arm 489 rocks upwardly, and the finger 490 thereon engages the counter lever 491 to actuate the latter. If it is desired to operate the machine without actuating the counter, the latter is disengaged by the simple expedient of rotating the finger 490 out of engagement with the counter lever 491.

ADDRESSOR-PLATE HANDLING MECHANISM

As previously indicated, the printing is accomplished through the medium of embossed printing plates which are fed into position below the printing ribbon so that the embossed matter on the printing plate produces an impression on an envelope above the ribbon and pressed downwardly thereagainst by the printing platen. These printing plates are fed from the plate magazine 340 (Fig. 1) into the printing station and then into the galley 338 by a mechanism now to be described.

Plate magazine

The plate magazine 340 is positioned above and supported on the right and left frame members 335 and 336, respectively. Thus referring to Figs. 27 and 29, the plate magazine includes a main magazine frame 492, which normally extends vertically and has at its lower end a pair of rearwardly extending lugs 493, which are pivotally supported at their rear ends on a shaft 494 extending between lugs on the left side and right side frame members, respectively, of the addressor frame, so as to permit rocking movement of the upper end of the magazine from the vertical position shown in Fig. 1 to a rearwardly inclined position, as shown in Fig. 24. The magazine tends to remain in the vertical position shown in Fig. 1 by virtue of its weight. However, it is yieldably retained in rearwardly inclined position by a cam 495 mounted on a lever 496, the cam cooperating with a pin 497 on the right lug 493. The lever 496 is fulcrumed at its lower end to the right side frame member 336 of the addressor by a screw 498, and is urged counterclockwise (as viewed in Fig. 29) by a tension spring 499. The upper end of the cam 495 has a slight depression 500 into which the pin 497 drops when the magazine is swung into rearwardly inclined position, as shown in Fig. 24. The cam is also shaped to engage the rear side of the pin 497 and thereby act as a stop to limit the rearward swing of the magazine.

The printing plates are substantially rectangular in shape and are stacked in flat position in the magazine. To retain the plates in vertical alignment in the magazine, the latter is provided with guide surfaces which engage the corners of the plates. Thus the rear corners of the plate are engaged by corner guide surfaces 501 formed in the magazine frame 492 (Figs. 25 and 26). The front edges of the plate adjacent their front corners are engaged by the rear surfaces of inwardly projecting edges 502 of magazine side members 503, which are hingedly mounted on the two sides of the magazine frame 492 for swinging movement from a closed position shown in Fig. 26, and an open position shown in Fig. 25. Thus each side member 503 is provided at its upper end with a hinged member 504 which is pivotally connected by a hinge pin 505 to the magazine frame 492, and is similarly secured at its lower end to a

hinge member 506 connected by a pin 507 to the magazine frame 492 (Figs. 25, 26, 27). The rear end of each of the upper and lower hinge members 504 and 506, respectively, on each side member 503, is also pivotally connected by a pin 508 to a clevis 509, and each diagonally opposite pair of clevises is interconnected by a lever 510, the two levers 510 crossing at their centers and being pivotally interconnected to each other and to the magazine frame 492 by a pivot screw 511. Each end of each lever is connected to its associated clevis by a pin and slot connection.

As will be described later, the side members are opened by manually opening the left side member alone, whereupon the mechanism including the lever 510 functions to automatically simultaneously open the right side member. The side members are normally yieldably retained in closed position by a compression spring 512 compressed between the upper portions of the two levers 510.

The printing plates are loaded into the magazine 340 from the galley (or drawer) 338 so that they need not be individually handled during the normal repeated operation of the machine. The galley 338 is nothing more than a filing drawer, and as many galleys may be employed as are necessary to handle the total number of address plates, extra galleys being stored in the usual filing cabinet. To load plates from the galley 338 into the magazine 340, the magazine is first opened by grasping a handle 513 (Figs. 1, 27) which is rigidly attached to magazine frame 492 and extends through an aperture provided therefor in the left side member 503. With the handle 513 engaged with the first and second fingers of the operator's left hand, the thumb of the same hand is in convenient position to press against a thumbpiece 514 on the left side member 503 and swing that member into open position which, through the action of the levers 510, simultaneously swings the right side member into open position. The members are automatically locked in this open position by a lock mechanism 515 (Figs. 27, 28). This lock mechanism includes a pair of latch links 516 and 517, which are pivotally supported at their outer ends in the lower clevises 509—509, respectively, and extend inwardly in overlapping relation with each other. The left link 516 (with reference to Fig. 27) has a latch head 518 on its free end which, when the side members are opened, as shown in Fig. 28, rides up over and engages with a latch head 519 on the right link 517, thereby retaining the side members in open position, against the force of the compression spring 512. The latch member 516 is yieldingly urged downwardly by a pair of compression springs 520 compressed between a shoe 521 (which rides on top of the left link 516) and the upper wall of a yoke 522, which is attached to the right link 517. The force exerted on the shoe 521 by the spring yieldably retains the links in the position of alignment shown in Fig. 27. The links are also in alignment when in fully latched position (Fig. 28).

While the side members are locked in open position, as described, a galley containing plates is tilted into vertical or nearly vertical position, with the handle end upward, and inserted into the magazine, being guided laterally during entry into the magazine by a pair of fingers 523 on the two sides of the magazine frame 492. The galley is moved into the magazine until the rear corners of the plates in the galley engage against the corner guide surfaces 501 of the magazine frame.

The lower end of the galley rests upon a pair of forwardly extending feet 524 on the magazine frame 492. Next the magazine and the galley as a unit are rocked rearwardly carrying the magazine into the rear position shown in Fig. 24. This so inclines the galley as to permit the operator to pull the galley away from the magazine and leave the stack of plates in the magazine. After the galley has been removed from the magazine, the operator pulls the magazine forwardly into normal position by means of the handle 513. This forward movement of the magazine automatically trips the lock mechanism 515 to permit the compression spring 512 to close the side members 503. Thus the lever 496, which carries the cam 495, is bent leftward (rightward with reference to Fig. 27) immediately above the cam and then again upwardly at a point substantially in alignment with the center line of the galley of the magazine. The upwardly bent end of the lever is bifurcated and supports, by a pivot pin 525 (Fig. 24) an arm 526. This arm has a stop shoulder 527 which bears against a cooperating shoulder on the lever 510 and limits counterclockwise rotation of the arm (with reference to Fig. 24). Furthermore, the arm 526 is yieldably urged into this counterclockwise position by a compression spring 528. When the magazine was rocked rearwardly after placement of the galley therein, the upper end of the arm 526 snapped past the links by virtue of its spring mounting. However, upon return of the magazine to vertical position, the upper end of the arm 526 engaged the right link 517 (with reference to Figs. 28, 29), and pressed the links upwardly, as shown in Fig. 28, to release the latch head 518 from the latch head 519. Thus the upward motion of the right (with reference to Fig. 28) link 517 caused a shoulder 529 on the extreme left end thereof, to bear against and lift the left link 516. As soon as the latch head 518 clears the latch head 519 the compression spring 512 functions to close the side members 503, so that by the time the magazine has been returned to vertical position after removal of the galley therefrom, the magazine is closed to retain the plates in a vertical stack therein. The cam 495 is so shaped as to permit rapid clockwise rocking of the lever 495 in response to return motion of the magazine toward normal vertical position so that the latch 515 is tripped to close the side members of the magazine substantially before the magazine has attained vertical position, thereby precluding any possibility of plates being ejected forwardly out of the magazine.

To prevent noisy closure of the side members 503, rubber bumpers 530 may be provided on the outer sides of the magazine frame 492 against which the side members abut as they reach the fully closed position.

Address plate-feeding mechanism

Plates are advanced one at a time from the bottom of the magazine 340 toward the printing station. Thus each plate is moved from the bottom of the magazine first into a position immediately in front of the magazine in one cycle of operation of the machine. In the next, or second, cycle the same plate is moved into a selection station. In the third cycle of operation, the plate is moved from the selection station into the printing station. In the fourth cycle, the plate is discharged from the printing station into a packer, which is positioned intermediate the printing station and the galley 338, and in the

fifth cycle, the plate is packed into the galley. The foregoing outline of operation assumes that each plate will remain in the printing station during only one cycle to print one envelope. As will appear later, mechanism is provided for selectively retaining a printing plate in the printing station to print a large number of envelopes with the same address, and when this is done the entire plate-feeding mechanism is maintained inactive until a new plate is to be printed from. As will also appear later, it is sometimes desired to pass certain printing plates through the machine without printing from them, under which condition the printing plates feed in the manner described during successive cycles of the machine, and the printing mechanism and the envelope-conveying mechanism are rendered inactive until a plate is reached that is to be printed from.

To move the printing plates out of the magazine, a reciprocating carriage mechanism is employed. This mechanism includes a plate-shifting carriage 531, which carriage includes as its main elements a pair of parallel horizontal carriage bars 532 which extend horizontally fore and aft of the addressor and are supported in lateral spaced apart relation by flanged rollers 533 rotatably supported on the main frame of the addressor. The carriage bars 532 are interconnected to each other for simultaneous fore and aft movement by a yoke 534, which yoke is pivotally connected by pins 535 to the two respective carriage bars 532—532. The yoke 534 in turn is also pivotally connected at its rear end by a pin 536 (extending across the bifurcated rear end of the yoke) to the upper end of a carriage-actuating arm 537, which arm, at its lower end, is freely rotatable on a shaft 538 which extends between and is journaled in the left side and right side frame members of the addressor.

It will be apparent from the foregoing description that in response to oscillation of the actuating arm 537 through a predetermined arc, the carriage bars 532 will be reciprocated through a predetermined distance.

To oscillate the arm 537, there is secured to the shaft 538, for oscillation therewith, a yoke 539. As will appear later, it is sometimes desired to permit oscillation of the yoke 539 without corresponding oscillation of the actuating arm 537. To this end a releasable locking mechanism is provided for coupling the yoke 539 to the arm 537. Thus, referring to Figs. 76, 78, 79, when the actuating arm 537 and the yoke 539 are engaged for movement in unison, the rear edge of the arm 537 is maintained against a seat 540 on the yoke 539 by a lockarm 541, which is pivotally supported at its upper end on the yoke 539, and has a notch 542 at its lower end which engages a corner 543 on a rearwardly extending arm 544 on the actuating arm 537. The lockarm 541 is urged against the arm 544 by a tension spring 545, so that the notch 542 in the lockarm normally remains in engagement with the corner 543 on the arm 544.

It will be observed that so long as the lockarm is in the position described, the actuating arm 537 is forced to oscillate with the yoke 539, which in turn is rigidly connected to the shaft 538, and oscillates therewith. The shaft 538 is oscillated in response to rotation of the addressor main drive shaft 406 (Fig. 18). Thus the main drive shaft 406 has an eccentric 546 which is interposed between the two sides of a yoke 547, pivotally supported for oscillation on a screw

548. Attached to the yoke 547 is an arm 549 which extends rearwardly and is pivotally connected at its rear end, as by a screw 550, to the upper end of a link 551. This link 551 is cylindrical in shape and extends through a sleeve member 552 which sleeve member is connected by trunnions to the rear end of an arm 553 secured to the left end (looking at the front of the machine) of the shaft 538.

A yieldable connection is provided between the sleeve member 552 and the link rod 551. Thus the rod has an annular groove 554 (Fig. 19) therein, which is normally engaged by the inner end of a pin 555 extending through the sleeve member 552 and urged inwardly by a compression spring 556 compressed between a flange 557 on the pin and a closure cap 558, which is threaded onto the sleeve and has an aperture through which the pin extends to the exterior. To permit locking of the pin 555 in retracted position, clear of the annular groove 554, a yoke 559 having cam faces on its bifurcated ends is pivotally secured to a head 560 on the pin 555. When the yoke 559 is in the position shown in Fig. 19, the pin 555 is pressed against the rod 551 by the spring 556, and if the yoke 559 is swung counterclockwise (with reference to Fig. 19) through 90°, it carries the pin 555 clear of the link rod 551.

The yieldable connection including the pin 555 is provided as a safety coupling to prevent damage to plates in case they should become jammed in any way.

It will be observed that the mechanism just described positively oscillates the yoke 534 in response to each revolution of the addressor main drive shaft 406, and the actuating arm 537 is normally oscillated with the yoke 539 to reciprocate the carriage bars.

When the carriage bars 532 are in the rearward end of their stroke, their rear ends extend a substantial distance rearwardly of the plates thereabove in the magazine, and shoulders 561 in the upper edges of the bar are positioned slightly back of the rear edge of the lowermost plate in the magazine so that when the bars reciprocate forwardly, the shoulders 561 will engage the bottom plate and carry it forwardly out of the magazine.

Thus referring to Fig. 79, the bottom printing plate 455 in the magazine is supported on a pair of stationary rails 562 formed on a spacer member 563 which is interposed between and secured to the upper edges of the two side members of the addressor frame. Also, as clearly shown in Fig. 79, each addressor plate has downwardly extending reinforcing ribs on the ends thereof, which extend below the level of the stationary rails 562 and into the path of the shoulders 561 on the carriage bars 532. Therefore, in response to forward reciprocation of the carriage bars, the bottom printing plate in the magazine is carried forwardly into the position 455a (Figs. 22, 85).

As shown in Fig. 22, the lower end of the front wall of the plate magazine has formed thereon a stripping shoulder 564 positioned a sufficient distance above the stationary rails 562 to permit the passage therebelow of the lowermost plate in the magazine, while engaging and preventing forward movement of the next plate thereabove, so that only one plate at a time can be fed from the magazine.

As has been previously stated, each plate is normally advanced into successive stations in successive cycles of operation of the machine, and

to insure the stoppage of each plate in each one of these stations, three movable stops 565 are provided (Figs. 22, 85, 87) to engage the front edge of each plate as it is moved into each new station and insure the stoppage of the plate in exact desired position. These stop members 565 are vertically movable in slots provided therefor in the spacer member 563, and each stop is guided for vertical movement through its associated slot by a pair of pins 567 extending downwardly from the spacer member 563 and engaging apertures in rearwardly bent ears 568 on the associated stop 565. The three stops 565 are reciprocated vertically simultaneously, to elevate the stops just prior to the final forward movement of the plates into the different stations, and to thereafter lower the stops clear of the plates to permit their movement out of the stations in the next cycle. These stops 565 are normally spring-urged into lower positions clear of the path of travel of the plates, but are adapted to be elevated by a longitudinally movable horizontal cam bar 569 having cam faces 570 thereon which engage the lower edges of downwardly extending tongues 571 on the stops 565. To spring-urge the stops into lower position, a compression spring 572 surrounds each pin 567 and is compressed between the spacer member 563 and the ear 568 through which the associated pin 567 extends. The cam bar 569 is slidably supported in bearing members 573 which depend from the spacer member 563. The cam bar is reciprocated by a shoulder on the upper end of the actuating arm 537. To permit adjustment of the exact position of the cam bar, it has an adjustable head 574 at the rear end thereof, this adjustable head engaging the arm 537. The arm 537 positively moves the cam bar forwardly, and during the reversing or rearward movement of the arm 537, the cam bar is constrained to follow the arm by a tension spring 575 stretched between the arm 537 and a downwardly depending arm 575' on the cam bar 569. The arm 537 moves through a substantially greater distance than the cam bar 569 and rearward movement of the cam bar is limited by engagement of the stops 565 against shoulders 576 on the cam bar. When the rearward movement of the cam bar is halted by engagement of the shoulders 576 against the tongues 571 of the stops 565, the tension spring 574 permits continued rearward movement of the arm 537.

It will be observed that the connection of the arm 537 to the cam bar 569 in the manner described provides for the forward movement of the cam bar and the resultant raising of the movable stops 565 near the end of the forward movement of the plate-advancing mechanism, so that during the initial part of each plate-advancing movement, the stops are out of the way of the plates.

Heretofore only the mechanism for moving the bottom plate in the magazine into the first station, has been described. To simultaneously move plates out of the first station (455a in Figs. 6, 22, 85), out of the second (or selection) station, and out of the third (or printing) station, the carriage bars 532 are provided with pawls 577, 578 and 579, respectively, which pawls are pivotally supported on the carriage bars 532 as at 580 for limited oscillatory movement with respect to the carriage bars. These pawls extend forwardly and upwardly from their pivots and have their forward ends urged upwardly by compression springs 581 compressed between the carriage bars

and the respective pawls. The portions of the carriage bars supporting the pawls 577, 578 and 579 are lower than the rails 562 so that the upper leading edges of the pawls, when in their uppermost positions, are substantially on a level with the upper edges of the shoulders 561. The uppermost positions of the forward ends of the pawls are determined by contact of the rear ends of the pawls with the upper edges of the carriage bars 532. The pawls remain in their upper positions, as shown in Fig. 86, except during rearward or retractive movement of the carriage bars, when the pawls are depressed by plates thereabove, and slip under the plates. During this rearward or retractive movement of the carriage bars and their pawls, the plates in the different stations are restrained from rearward movement therewith by retaining pawls 582 (Fig. 85), which are mounted for rocking movement in the horizontal plane of the plates and have hooks thereon which engage the rear corners of the plates.

As clearly shown in Fig. 85, only one retaining pawl is provided at each station, the pawls for the first and second stations being on the left side, and the pawl for the third station being on the right side. These pawls 582 are mounted in recesses provided in the upper edges of the left and right side members 335 and 336 of the addressor frame. Except where they are recessed to make room for the retaining pawls 582, the upper edges of the side frame members 335 and 336 form relatively closely fitting guides for the end edges of the printing plates and prevent the plates from becoming cocked, such cocking of the plates might otherwise result because of the fact that only one retaining pawl is provided on one side of each station.

As shown to best advantage in Fig. 79, the upper edge of each of the side frame members, which constitute guides for the end edges of the printing plates, has an overhanging lip 583 for retaining the printing plates against the stationary rails 562; otherwise the pawls 577, 578 and 579 (Fig. 86) would lift the plates away from the supporting rails during reverse or retractive movement of the carriage bars.

It will be apparent from the foregoing description that in response to successive reciprocation of the carriage bars 532, plates will be successively advanced from the bottom of the printing magazine into the first station, indicated at 455a, in Figs. 22 and 85; then into the second (selection) station, indicated at 455b (by the pawls 577, Fig. 86); then from the selection station into the printing station indicated at 455c, by the pawls 578; and finally out of the printing station, by the pawls 579, into the packer. In the next succeeding cycle a plate in the packer is packed into the galley.

Plates are positioned vertically in the packer and are therefore turned from horizontal to vertical position during movement from the printing station into the packer. To this end the forward ends of the stationary rails 562 merge into forwardly and downwardly curved surfaces 584 on the spacer member 563 (Figs. 22, 85). As the plates are advanced out of the printing position past the retracted stop 565, they slide down over the surfaces 584 and come to rest with their lower edge against shoulders 585 of a packer gate 586, which normally extends substantially vertically and is pivotally supported at its upper end on a shaft 587 extending between the left and right side members of the addressor. Forward movement of the plates away from the surfaces 584 is

prevented by engagement of the ends of the plates against stationary rails 588 on the two side frame members of the addressor (Fig. 22).

The packer gate 586 is adapted to be oscillated through a small angle about the shaft 587 once during each cycle of the machine. To this end, a pivot screw 589 on the right edge of the packer gate is normally engaged in a notch 590 in the underside of the forward end of a link 591, which link is pivotally connected at its rear end to an arm 592 (Figs. 21, 22) on the oscillating shaft 538, which, as previously described, oscillates the actuating arm 537 to reciprocate the carriage bars. As the shaft 538 oscillates in the direction to advance the carriage bars, the link 591 is retracted to swing the lower end of the packer gate 586 rearwardly, so that the shoulders 585 on the packer gate are positioned to catch a plate advanced out of the printing station of the machine. This position is illustrated in Fig. 22. As the oscillatory shaft 538 returns the carriage bars rearwardly, the link 591 is moved forwardly to swing the lower end of the packer gate 586 forwardly and disengage the shoulders 585 thereon from the printing plate. The printing plate is prevented from following the movement of the packer gate by contact of the ends of the plate against the rails 588. As soon as the shoulders 585 clear the printing plate, it is freed to drop down into the galley drawer 338.

As clearly shown in Fig. 22, during each rearward swinging movement of the packer gate 586, the lugs which define the shoulders 585 engage against the ends of the plate last deposited in the galley and force the plates in the galley rearwardly to make room for the newly admitted plate. The plates in the galley are yieldably restrained against rearward movement therein by a frictionally controlled stop member 593 of conventional design.

As previously indicated, the forward end of the links 591 is connected to the pivot screw 589 by means of the notch 590 so that by lifting the forward end of the link it can be disengaged from the packer gate. To facilitate such disengagement the extreme forward end of the link is extended through the front plate 594 as a handle 595. The forward end of the link is yieldably urged downwardly to engage the notch with the pivot screw not only by its weight, but also by a small tension spring 596.

When the machine is in rest position, the link 591 and the packer gate are in their rearward positions. Under these conditions, the packer gate is in position to catch a plate discharged from the printing station. The releasable connection between the link 591 and the packer gate 586 is provided to permit manual release of the packer gate into forward position to deliver a plate in the packer into the galley.

Galley construction and interlock

As has been previously indicated, the galley 338 is simply a filing drawer of conventional type and is supported in the addressor in a galley frame 597. This galley frame includes low, side, front and rear walls 598 for engaging the galley, and retaining it in proper position on the galley frame. The galley frame 597 is pivotally supported at its rear end on the addressor, the galley having a pair of ears 599 from which pins extend into bearing apertures in the side frame members of the addressor. The front end of the galley frame 597 is swingable from a lower position, as shown in Fig. 14a, into an upper position as shown in Fig.

14. A galley is inserted in the galley frame while the latter is in the lower position shown in Fig. 14a. Thereafter, the operator elevates the galley frame 597 by means of a handle 600 on the front end thereof and the galley frame is locked in the upper position by a mechanism now to be described. Thus there is pivotally secured to the forward end of the galley frame a U-shaped latch member 601, which includes a cross bar 602 extending below the galley frame and a pair of upstanding arms 603 which have apertures therein engaged by pins 604 extending laterally from opposite sides of the galley frame. The arms 603 have latch noses 605 on the upper ends thereof, which are adapted to engage stationary pins 606 in the two side members of the addressor when the galley frame is in upper position, as shown in Fig. 14. The U-shaped latch member is yieldably urged into position to engage the latch noses with the pins 606, by a tension spring 607. To permit manual disengagement of the latch noses 605 from the pins 606 a lever 608 is fulcrumed on the underside of the latch frame immediately in front of the cross bar 602 of latch member 601. The lever has a thumbpiece 609 positioned adjacent to the handle 600, and at its rear end it is bent downwardly to define a shoulder 610 that normally engages the front edge of the cross bar 602, and is maintained in a normal position by the cross bar, the latter being yieldably urged against the shoulders 610 by the tension spring 607. However, the operator can, by pressing against the thumbpiece 609, rock the lever 608 to shift one end of the shoulder 610 rearwardly and thereby carry the cross bar 602 rearwardly to rock the arms 603 and disengage the latch noses 605 from the pins 606, thereby permitting movement of the galley frame into the lower position (Fig. 14a).

As has been previously described, the galley is in operative relation with the packer gate 586 only when the galley is in the upper position shown in Fig. 14. If attempt were made to operate the machine with no galley in the galley frame, or with the galley and galley frame in lower position, plates would not be packed into the galley but would be piled up in the galley or spilled out of the machine onto the floor. An interlock is therefore provided to positively prevent such operation of the machine as could result in the delivery of plates to the galley, except when the galley is in the galley frame and the latter is in its upper position. This interlock functions through the front plunger 240, which, as was explained in the description of the power-plant, takes the driving clutch out of the control of the rear plunger 241, and the driving clutch must be engaged by depression of the rear plunger 241 in order to drive the addressor.

Thus referring to Fig. 14, a slide bar 611 is slidably supported in a guide 612 on the left frame member of the addressor for free vertical movement. The slide bar 611 has adjacent its upper end a laterally projecting pin 613 which is engaged by the left edge of a galley in the galley frame when the latter is moved into upper position. The lower end of the slide bar 611 has a pin 614 which projects into a slot in an arm 615 which arm is secured to a shaft 616 rotatably supported in journals in the left frame member of the addressor. The slide bar 611 and the arm 615 are positioned on the right side (looking at the front end of the machine) of the left frame member of the addressor, and the shaft 616 projects through this left frame member and has

mounted on its left end an arm 617 which projects downwardly and forwardly and is pivotally connected at its lower end to the front end of a shoe 618. The rear end of shoe 618 is pivotally connected to the lower end of an arm 619 which is pivotally supported by a screw 620 on the frame of the machine and is of the same length as and extends parallel to the arm 617, so that the two arms support the shoe for swinging movement while maintaining it horizontal. To yieldably urge the shoe into lowermost position, a tension spring 621 is connected between an upward projection 622 of the arm 619 and the frame of the machine. When the addressor is in coupling position with respect to the powerplant, the shoe 618 overlies the front plunger 249 and the spring 621 forces the shoe down with sufficient force to depress the plunger 249 unless the shoe is restrained from downward movement by the slide bar 611. When the galley frame 597 is in lower position, or there is no galley in the galley frame, the slide bar 611 follows the movement of the shoe 618 in response to the spring 621. However, when a galley is positioned in the galley frame and the latter is raised into upper position, the pin 613 in the upper end of the slide bar is engaged by the left side wall of the galley and lifted upwardly, simultaneously rocking the arm 615, shaft 616, and arm 617, to elevate the shoe 618 and permit the plunger 240 to move upwardly into its normal inactive position.

INK RIBBON ACTUATING MECHANISM

The position of the inking ribbon and its two supporting reels has been previously described in connection with the printing apparatus. The mechanism for driving the ribbon reels will now be described:

The ribbon reels are adapted to be selectively rotated by a drive mechanism from the main oscillatory yoke 539 which is secured to the oscillatory shaft 538 (Fig. 22). It will be recalled that yoke 539 oscillates once during each revolution of the main addressor drive shaft.

Secured to the yoke 539 (Fig. 22) by a pin 622, is a double clevis 623 which is secured at its other end by a clevis pin 624 to the rear end of an actuating rod 625. This rod extends forwardly just inside of the left frame member of the addressor to a point immediately back of the ink ribbon 454, where it is connected by a double clevis 626 to the left end (looking at the front of the machine) of an arm 627 of a bell-crank lever 628 fulcrumed by a pin 630 on a bracket 629 anchored to the underside of the spacer member 563. (Figs. 22, 79.) The bell-crank lever 628 has a forwardly extending arm 631, which has a vertically extending pin 632 thereon engaging a slot in a rearwardly extending lug 633 on a slide bar 634. The slide bar 634 lies against the front face of the bracket 629 (Figs. 80, 81), and is slidably supported in this position by pins 635 on the bracket, which pins engage slots 636 in the slide bar.

Referring to Fig. 80, the slide bar 634, which is positioned in a vertical plane extending laterally just back of the ribbon reels 456 and 457, has pivotally connected to one end (the left end looking at Fig. 80, which is a rear view), a pawl 637 adapted to cooperate with a ratchet wheel 638 on the ribbon reel 457, and has pivotally connected to its opposite end a pawl 639 adapted to cooperate with a ratchet wheel 640 on the other ribbon reel 456. Each of the pawls 637

and 639 has a pin in its outer end which engages the teeth of its associated ratchet wheel when the pawl is in operative relation therewith.

It will be observed from Fig. 80 that counterclockwise rotation of either ribbon reel winds the ribbon up onto that reel. Therefore, counterclockwise rotation of either ribbon reel must be accompanied by clockwise rotation of the other reel. Furthermore, both the ratchet wheels 638 and 640 have their teeth so inclined that they can be rotated by their associated pawls only in counterclockwise direction. It follows that when either pawl is in driving relation with its associated ratchet wheel, the other ratchet wheel must rotate in the opposite direction, and therefore its associated pawl must be rendered inoperative. Furthermore, it will appear that by rendering either pawl operative, and the other pawl inoperative, the direction of movement of the ribbon can be reversed.

Means is provided for rendering either pawl operative and simultaneously rendering the other pawl inoperative. This means includes (Fig. 80) a three-armed lever 641 fulcrumed by a pin 642 on the bracket 629, for rocking movement in a transverse vertical plane. At one end, the lever 641 has a lug 643 positioned below the pawl 637, and at the other end it has a lug 644 positioned below the pawl 639. In Fig. 80, lever 641 is rocked counterclockwise so that the lug 644 has engaged the pawl 639 and lifted it out of engagement with its associated wheel 640. It will be apparent that with the apparatus in the position shown in Fig. 80, reciprocation of the slide bar 634 will drive the ratchet wheel 638 by the pawl 637, while the opposite ratchet wheel 640 will be rotated in clockwise direction by the ribbon as the latter is wound up onto the reel 457. In Fig. 81 the lever 641 has been rocked clockwise from the position shown in Fig. 80, so that it has disengaged the pawl 637 from the ratchet wheel 638 and released the pawl 639 into driving engagement with the ratchet wheel 640. Therefore, with the apparatus as shown in Fig. 81, the reel 456 is driven counterclockwise to wind up the ribbon, and the opposite reel 457 is rotated clockwise by the ribbon.

The extent of rocking movement of the lever 641 is limited by engagement of the active lug 643 or 644 thereon with the under edge of the slide bar 634. A spring toggle mechanism is employed to yieldably retain the lever 641 in whichever extreme position it may be rocked into. This mechanism includes a tension spring 645 stretched between the lower end of a third downwardly extending arm 646 on the lever 641 and the upper end of an arm 647, which is pivotally supported at its lower end by the fulcrum pin 642, and extends upwardly. This arm 647 is capable of limited rocking movement on either side of the vertical position, such movement being limited by a pin 648 on the arm 647, which pin projects into an arcuate slot 649 in the bracket 629.

Shifting of the lever 641 is accomplished by forcibly rocking the arm 647 from one end of its travel to the other. Such movement shifts the line extending through the point of attachment of the tension spring 645 on the arm 646 through the fulcrum center 642, thereby rendering the spring effective to throw the lever into its opposite extreme position.

The arm 647 is rocked between the two extreme positions shown in Figs. 80 and 81, respectively, by a transverse link 650, which has a slot 651 engaging the pin 648 of the arm 647. The opposite

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ends of the transverse link 650 are pivotally connected to arms 652 and 653 respectively, on hubs associated with the ribbon reels 456 and 457, respectively. The two hubs to which arms 652 and 653 are connected are identical, but the arm 653 extends upwardly from the axis of its hub (Figs. 80, 81) whereas the arm 652 extends downwardly with respect to the axis of its hub. Therefore a description of the mechanism associating one of the arms with its cooperating reel, will be sufficient.

Referring to Fig. 84, which is a section through the reel 456, the arm 652 is formed integrally with a hub 654, which hub is rotatably supported on an enlarged section 655 of a stub shaft 656, which is anchored to a bracket 657 of the addressor left side frame member 335. The outer end of the shaft 656 rotatably supports the associated ribbon reel 456 and the ratchet wheel 640. The ratchet wheel and the reel are interlocked for rotation together by a pin 658. The ribbon reel 456 is retained on the shaft 656 by a diametrical slide 659 on the outer side of the reel, which slide has a key-hole slot 660 therein cooperating with an annular groove 661 in the shaft 656. The slide 659 has a handle 662 thereon to permit manual rotation of the reel and to facilitate manipulation of the slide 659 to lock or unlock the reel with respect to the shaft. To provide a frictional brake between the reel and its supporting shaft 656, a helical spring 663 surrounding the shaft 656 is compressed between a collar 664 pinned to the shaft and a collar 665 keyed to the shaft for limited longitudinal movement thereon, this collar 665 bearing against the end of a counterbore 666 in the ribbon reel 456.

The reel 456 contains a bearing hole 667 parallel to but displaced radially from the axis of the spool, in which bearing hole there is oscillatably supported a shaft 668. The bearing hole 667 is very close to the ribbon-receiving surface of the hub of the spool and terminates at its inner end in a recess 669 (Fig. 83) in the hub of the spool. At its inner end the shaft 668 is bent to form a curved arm 670 which is adapted to be received within the recess 669 (as shown at the left in Fig. 83) or projected from the recess (as shown at the right in Fig. 83). So long as the spool has ribbon thereon, the arm 670 is retained within the recess, as shown at the left in Fig. 83. But when all the ribbon has been unwound from the spool, the arm 670 is forced out of the recess by a leaf spring 671.

Referring back to Fig. 84, the shaft 668 extends out of the spool and through an arcuate slot 672 in the associated ratchet wheel 640. Immediately to the left of the ratchet wheel 640, the shaft 668 is bent to form an arm 673 (Fig. 82) which is positioned within an annular row of dogs 674 extending from the hub 654. When the arm 670 is contained within the recess 669, as shown at the left in Fig. 83 the arm 673 on the other end of the shaft is clear of the dogs 674, as shown at the left in Fig. 82. However, when the arm 670 has been displaced out of the recess 671, as shown at the right in Fig. 83, the arm 673 is rocked into position to engage one of the dogs 674, as shown at the right in Fig. 82.

It will be apparent from the foregoing description that so long as both reels have one or more turns of ribbon thereon, the arms 673 on both reels are held clear of the dogs 674 so that there is no force tending to rotate or rock either of the hubs 654. However, when the last turn of ribbon leaves the unwinding reel, the arm 670 in that

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reel is raised by its associated spring 671 (Fig. 83) to rock the arm 673 into engagement with one of the dogs 674 (Fig. 82) so that thereafter the rotation of that spool rocks the associated hub 654.

Now referring to Figs. 80 and 81, it will be observed that the unwinding reel must always rotate in clockwise direction, so that the movement of the hub 654 just described is in clockwise direction. With particular reference now to Fig. 80, it will be observed that the unwinding spool 640, during its final clockwise rotation, will rock the arm 652 clockwise to shift the link 650 to the left into the position shown in Fig. 80, which, as previously described, raises the pawl 637 out of driving engagement with the ratchet wheel 638 and lowers the pawl 639 into driving engagement with the ratchet wheel 640, so that the direction of feed of the ribbon is reversed.

It will be obvious that, after the machine has operated long enough in the position shown in Fig. 81, to unwind the ribbon from the reel 457, its associated arm 653 will be rocked clockwise, to shift the link 650 to the right, and restore the apparatus into the condition shown in Fig. 80, in which the ribbon will be fed from the reel 456 back onto the reel 457.

The hub of the arm 653 (Fig. 80) has a handle 675 projecting therefrom to permit manual reversal of the ribbon, when desired.

ENVELOPE PRINTING COUNTER

As has been previously described, an envelope positioned below the printing head of the addressor has an address or other desired subject matter printed thereon from one of the embossed printing plates. It is also often desirable to simultaneously print auxiliary matter on the envelope. It has been previously stated that the printing platen 453 (Fig. 52) has on its underside a rubber cushion 461 having two embossed or raised pressure areas; one of which is relatively large and serves to press the envelope against a printing plate, and the other of which is relatively small and is longitudinally spaced from the first, for pressing another portion of the envelope against an auxiliary printing device. In the present machine this auxiliary printing device is adapted to print the date, or a trade slogan, or a number, or any combination thereof. Furthermore, it is adjustable to print the same number on each of a series of envelopes printed from the same address plate, or to print different serial numbers on successive envelopes of the series. The device is also adjustable as a whole into and out of printing position so that the auxiliary printed matter can be omitted from any envelope, when desired.

The printing device is indicated at 676 in Figs. 34, 37, 79, and includes a U-shaped frame member 677 (Figures 37 and 38), the arms of which U-member have vertically extending holes 678 therethrough for screws 679, which extend down through the frame member 677 and are screwed into a stationary bracket 680 on the left side of the left frame member 335 of the addressor. The upper ends of the holes 678 are counterbored to pass the heads of the screws 679 and the frame member 677 is urged downwardly by compression springs 681 compressed between the heads of the screws 679 and the lower ends of the counterbores.

The frame member 677 is adapted to be moved from a lower position (into which it is urged by the springs 681) through an intermediate position, into an upper position. The intermediate

and upper positions are printing positions and the lower position is the inactive position. The mechanism for raising the frame member 677 includes a pair of identical side plates 682 (Fig. 37) which bridge the arms of the U-shaped frame member, and the lower edges of which are cut to define cam surfaces. These cam surfaces cooperate with cam surfaces on the upper edges of a channel-shaped slide 683, which is reciprocable fore and aft below the U-shaped frame member 677. Thus it is slidably supported on the upper surface of the bracket 680, and is pivotally connected at its forward ends to the rear end of a link 684, the forward end of which link is pivotally connected to an upwardly extending arm 685 of a bellcrank lever 686 (fulcrumed at 693 to the frame of the machine) and having a forwardly extending arm which extends through a slot 687 in the control panel 337 and terminates in a handle 688. When the handle 688 is rocked into the highest position opposite the legend "Print number" on the control panel, the channel-shaped slide 683 is moved into its rearmost position (Fig. 37) in which the lower edges 689 of the side plates 682 are resting upon the upper edges 690 of the channel-shaped slide 683, whereby the printing device 676 is in its upper position. When the handle 688 is rocked into intermediate position opposite the legend "Print date" on the control panel, the slide 683 is rocked forwardly into the position shown in Fig. 48, in which the lower edges 689 of the slide plate 682 are resting upon intermediate steps 691 of the slide 683, and the printing device is held in intermediate position. When the handle 688 is in lowermost position opposite the legend "Off" on the control panel, the slide 683 is in extreme forward position, in which the lower edges 689 of the side plate 682 rest upon the lowermost steps 692 of the slide 683, and the printing device is in lower or inactive position, as shown in Fig. 20.

To yieldably retain the handle 688 in the three positions of adjustment, the handle has formed integrally therewith a sector plate 694 having three recesses 695 therein which cooperate with a spring-pressed ball detent of standard construction, not shown in detail in the drawings.

Adjustably supported within the U-shaped frame member 677 is a printing counter 696, which may be of any well-known construction, having type wheels 697 which expose printing surfaces through a window in the top wall of the counter. The printing counter 696 is slidable fore and aft in the U-shaped frame member 679, and is adjustable therein by means of a screw 698 threaded through the front wall of the U-shaped frame member and having a tip 699 extending into a hole provided therefor in the printing counter. This tip 699 has an annular groove 700 therein which is engaged by a pin 701 in the printing counter, for preventing longitudinal motion of the counter relative to the screw, while permitting free rotation of the screw (Fig. 42). The screw 698 has the outer edges of the threads cut away on four sides (Fig. 41) to provide four surfaces cooperating with a shoe 706 pressed against the screw by a spring 707, to yieldably retain the screw in a position of adjustment.

The counter 696 has an actuating plunger 702 which extends rearwardly therefrom through a passage provided in the rear wall of the U-shaped frame member 677.

Referring now to Figs. 39 and 40, the plunger 702 is slidably supported by a bushing 703 in the rear wall of the counter, and is connected by a

pin 704 to an actuating pawl associated with a ratchet wheel of the counter, in accordance with conventional counter design. The plunger 702 is urged into a rearward or retracted position by a compression spring 705, and is adapted to be moved forwardly by a mechanism to be described later. In response to each reciprocation of the plunger 702, the printing counter is actuated to print the next higher number.

It has previously been explained how the counter can be adjusted into a lower inactive position, an intermediate printing position, and an upper printing position. Whenever the type wheels 697 of the counter are to be used for printing purposes, the counter is adjusted into the uppermost position, as indicated by the legend on the control panel "Print number." In this position the height of the printing counter is such as to bring the exposed type faces therein on a level with the embossed printing surfaces of the printing plate.

It is sometimes desired to print the same subject matter, such as the date or a slogan, on all of the envelopes handled, and when this is to be done, the printing counter is adjusted into the intermediate position, and an auxiliary printing device is positioned on top of the printing counter 696. This auxiliary device is of such thickness that, with the printing counter in intermediate position, the printing surface of the auxiliary device is at the same level as the printing plates of the machine. Thus referring to Figs. 49, 50 and 51, the auxiliary device comprises a flat frame member or plate 708 adapted to set flat on the top of the printing counter 696 and be secured thereto by a pair of rigid hooks 709 and a spring latch 710, all of which extend down through cooperating notches in the top plate of the printing counter and hook under the edge of the said top plate. The device may be attached to the printing counter by simply pressing it into place thereon, and may be released by swinging the spring latch 710 and lifting the plate off the counter.

The plate 708 is adapted to support a thin embossed printing plate 711, which is secured to the plate 708 by a pair of headed pins 712 at one end and a spring clip 713 at the other end. The embossed printing plate 711 may have any desired matter embossed thereon.

It is sometimes desired to print other matter in addition to a number, on envelopes, when the printing counter 696 is in uppermost position. This may be done by attaching thin embossed printing plates 714 to the upper surface of the printing counter in front of and back of the exposed sections of the type wheels. The front plate 714 (Fig. 43) is secured in place by headed pins 715 and a pair of spring clips 716. The rear printing plate 714 is secured in place by headed pins 717 and a single spring clip 718. Fig. 45 shows the result obtained when the printing counter prints a number on an envelope, and plates 714 bearing the date and a trade slogan, are mounted directly on the printer. Fig. 46 shows the result obtained when the auxiliary plate 708 is employed to support an embossed printing plate 711 (Fig. 49) bearing only the date.

It will be observed from Fig. 45 that the name and address are printed on the envelope at a higher level than the date, number, and trade slogan. However the position of the auxiliary printing matter may be adjusted by adjusting the printing counter 696 within the U-shaped frame

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member 677, by the adjusting screw 698, in the manner previously described.

Printing counter actuating mechanism

It has previously been stated that the printing counter is actuated in response to each reciprocation of the actuating plunger 702. This plunger is actuated through a mechanism, next to be described, from the oscillatory shaft 538, which was described in connection with the mechanism for reciprocating the carriage bars 532 to feed printing plates through the machine.

Normally positioned in a plane immediately back of the rear end of the actuating plunger 702 is an arm 719 which is secured to the forward end of a rod 720 (Figs. 34, 37). This rod 720 is supported for longitudinal sliding movement in bearing 721 in a bracket 722 secured to the left side of the left side member 335 of the addressor frame. The rod extends rearwardly beyond the rear end of the bracket 722, and is urged rearwardly by a compression spring 723 compressed between the end of a counterbore 724 (Fig. 35) and a slide member 725 secured to the rear end of the rod 720. To restrain the arm 719 and the rod 720 against rotation, there is secured to the arm 719 a pin 726, which extends rearwardly parallel to the rod 720 and engages a notch 727 in a bracket 728, which is secured to the bracket 722.

As shown to best advantage in Fig. 35, the arm 719 has a nose 729 which, when the printing counter is in upper position, is juxtaposed to the end of the actuating plunger 702 of the counter, so that forward movement of the arm 719 will engage the actuating plunger and depress it to index the counter. However, when the printing counter is in either the intermediate or the lower position, previously described, the actuating plunger 702 is below the nose 729 (Fig. 20) of arm 719, so that reciprocation of the arm does not actuate the plunger.

The slide member 725 (Figs. 35, 37) has pivotally secured thereto, by a pivot pin 730, a latch lever 731. The head of the pivot pin 730 rides in a guide slot 732 in a guide member 733 secured to the side of the bracket 722.

Extending outwardly from the side of the latch lever 731 is a stud 734, which cooperates with a cam member 735 having a shoulder 736 and a cam surface 737. The cam member 735 is fixed to an arm 738 secured to the shaft 538, which, as has been previously described, oscillates in response to each revolution of the addressor main drive shaft.

As has been stated, the latch lever 731 is pivoted to the slide member 725, and its counterclockwise movement with respect to the slide is limited by engagement of a lip 739 thereon with the upper edge of the slide member 725. When the cam member 735 is in rearmost position and the rod 720 is also in rearmost position (rearward movement of the rod being limited by engagement of the arm 719 with the bracket 728, Fig. 34), the stud 734 (Fig. 36) is positioned directly in front of the shoulder 736 on the cam member 735. Therefore, as the cam member rocks forwardly in response to rotation of the addressor main drive shaft, the cam shoulder engages the stud 734 and slides the latch lever 731, the slide member 725, and the rod 720 forwardly. At the beginning of each cycle of operation of the machine, the shaft 538 is in extreme clockwise position and rocks counterclockwise during the first half of the cycle and returns in

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clockwise direction during the second half of the cycle. Therefore it is at half cycle position that the shoulder 736 on cam member 735 engages the stud 734 and begins to advance the assembly, including the rod 720. This position is shown in Fig. 36.

Forward movement of the latch lever 731 carries a cam surface 740 thereon against a shoulder 741 on the guide member 733, and continued forward movement of the slide member 725 cams the latch lever 731 clockwise, to carry the stud 734 upwardly along the shoulder 736 on the cam member 735, and, at substantially three-quarter cycle position (Fig. 37), the stud 734 clears the shoulder 736, whereupon the rod assembly is snapped rearwardly by the compression spring 723, thereby completing a normal operating movement of the arm 719.

The mechanism as described would function to index the counter in response to every revolution of the addressor main drive shaft. However in the actual operation of the machine it often happens that the addressor main drive shaft is rotated without an envelope being printed, and obviously the counter should only be indexed in response to the actual printing of envelopes. Furthermore, as will be described in detail later, the machine can be adjusted to print a series of envelopes from the same printing plate, under which condition it may be desirable sometimes to give successive envelopes successively higher numbers, and at other times give all the envelopes of the series the same number. Therefore, means is provided for selectively disabling the counter-indexing mechanism during the printing of a series of envelopes with the same address.

Disabling of the printer-indexing mechanism is always accomplished by rocking the latch lever 731 (Fig. 36) clockwise to carry the stud 734 thereon above the path of movement of the shoulder 736 on the cam member 735, so that the assembly including the rod 720 is not reciprocated in response to the clockwise rocking of the cam member 735. However, this rocking of the latch lever 731 into disabled position can be accomplished by either of two different mechanisms, one associated with the printing head mechanism and the other associated with the multicating and repeating mechanisms (to be described later), which determine whether or not a series of envelopes is to be printed from the same address plate.

The mechanism associated with the printing head mechanism for rocking the latch lever 731 into disabled position includes an arm 742 on the latch lever 731, which arm is adapted to be engaged by a pin 743 on the rear end of an arm 744 of a 4-arm bellcrank lever 745 fulcrumed at 746 to the left frame member of the addressor. It will be apparent from Fig. 20 that clockwise rocking of the bellcrank lever 745 causes the pin 743 on arm 744 to engage the arm 742 on the latch lever 731 and rock the latter clockwise, to carry the stud 734 above the path of the cam shoulder 736. The bellcrank lever 745 controls the operation of the printer head in a manner to be described later and is rocked into the clockwise position mentioned whenever the printing head is to be prevented from functioning.

The mechanism associated with the multicating mechanism for rocking the latch lever 731 into disabled position, includes a link 747 (Fig. 37), which is pivotally connected at its upper end to the rear end of the latch lever 731 and has a

shoulder 748 adapted to cooperate with a pin 749 extending laterally from the arm 544 which, as previously described, forms a part of the actuating arm 537 which reciprocates the carriage bar 532 of the plate-feeding mechanism.

Furthermore, when the plate-feeding mechanism is disabled (by disengagement of the lock arm 541 from the corner 543 on arm 544), the arm 544 and the pin 749 extending therefrom are left in their uppermost positions, and if the shoulder 748 on link 747 is in engagement with pin 749 at such time, the latch lever 731 will be rocked by the link 747 into its disabled position.

If the link 747 were always positioned so that its shoulder 748 was engaged by the pin 749, then the printer indexing mechanism would be disabled whenever the plate-feeding mechanism is disabled and a plurality of envelopes are being printed from the same plate. A control means is therefore provided to swing the lower end of the link 747 rearwardly and carry the shoulder 748 thereon out of the path of movement of the pin 749 when envelopes of a series being printed with the same address are to be numbered serially. This mechanism includes a lever 750 (Fig. 20) fulcrumed intermediate its ends by a screw 751 to a bracket 752 on the left frame member of the addressor. The lower end of the lever is connected by a link 753 to one arm 754 on a bellcrank lever 755 fulcrumed at 756 to the left frame member of the addressor. The bellcrank lever 755 is positioned immediately back of the control panel 337 and has a handle arm 757 which extends forwardly through a slot in the control panel 337. When the handle 757 (Fig. 1) is in the upper position opposite the legend "Consec. No.," the bellcrank lever 755 and the lever 750 are rocked counterclockwise (with reference to Fig. 20), and when the handle 757 is in lower position opposite the legend (Fig. 1) "Duplic. No.," the levers are rocked clockwise. It is apparent, therefore, that when the machine is adjusted to print consecutive numbers on a series of envelopes printed from the same address plate, the lever 750 is in its extreme counterclockwise position, as shown in Figs. 20 and 37, and when the machine is adjusted to give the series of envelopes duplicate numbers, the lever 750 is rocked into its extreme clockwise position, as shown in Fig. 34.

The lever 750 has at its upper end a pin 758 which extends laterally across the plane of movement of the link 747, and when the lever 750 is in its counterclockwise position the pin 758 holds the lower end of the link 747 rearwardly so that the shoulder 748 thereon is out of the path of movement of pin 749. Therefore, although the pin 749 rocks during every cycle of operation of the addressor, the link 747 is not lifted by the pin 749, and the latch lever 731 remains in its normal counterclockwise position with its stud 734 in the path of the cam shoulder 736, so that the counter is indexed once in each cycle of operation of the machine.

The bracket 752 has an upwardly extending arm 759 thereon, which arm has a slot for guiding the link laterally.

When the lever 750 is in its extreme clockwise position, the pin 758 thereon is shifted to the right clear of the link 747, so that the latter is free to rock counterclockwise and have its shoulder 748 engaged by the pin 749, under which conditions the latch lever 731 is disabled, as previously described. To yieldably urge the link into engagement with the pin 749, an auxiliary arm 760 is pivoted to the lever 750 at 761 and is

urged clockwise by a tension spring 762 stretched between the lever 750 and the arm 760. This arm 760 has a finger 763 extending transversely back of the link 747, and when the lever 750 is in clockwise position the finger 763 yieldably engages against the link 747 to urge it into the path of travel of the pin 749. The arm 760 is provided with a stop 764 which bears against the lever 750 to maintain a spaced apart relation between the finger 763 and the pin 758, to permit a necessary amount of free movement of the link 747 between the finger 763 and the pin 758.

CONTROL MECHANISM FOR PRINTING HEAD

It was previously described under the title "Printer head" (Fig. 34) that during each revolution of the addressor main drive shaft 406 the cam 481 thereon raises the rear end of the lever 479, and when the cam releases the lever the printing head is driven downward by its spring 470 (Fig. 53). However the operation of the printer head can be selectively prevented by a mechanism now to be described.

Referring to Fig. 34, this mechanism includes a pin 765 on the rear end of lever 479 which pin is adapted to be engaged under certain circumstances by a shoulder 766 on a lever 767 fulcrumed to the printer head frame at 768. As shown in Fig. 34, the shoulder 766 is maintained out of the path of the pin 765 by engagement of the shoulder against a pin 769 on a link 770, which link is in a rearward position in Fig. 34. This link 770 is connected at its front end by a pin 779 to the lower end of a lever 780 fulcrumed at 781 to the printing head bracket 452. The lever 780 thereby supports the forward end of the link 770 for longitudinal movement. A tension spring 771, stretched between the lower end of the lever 767 and the pin 779, tends to maintain the lower end of lever 767 in contact with pin 769, so that unless otherwise restrained the lever follows the movements of the link 770. It will be observed, therefore, that whenever the link 770 is in its rearward position, as shown in Fig. 34, the printer is free to operate in response to each rotation of the cam 481. On the other hand, when the link 770 is in a forward position, as shown in Fig. 15a, the lever 767 is rocked to carry the shoulder 766 below the pin 765 as the latter reaches its uppermost position in response to rotation of the cam 481, and thereafter prevents downward movement of the pin 765 (and the printer head), thereby preventing a printing operation during that cycle of the machine.

Referring to Fig. 15a, the link 770 extends rearwardly and downwardly and is pivotally connected at its rear end to an upper arm 772 of a bellcrank lever 773 fulcrumed on the left frame of the addressor, which lever has a forwardly extending arm 774 pivotally connected to the upper end of a link 775. A tension spring 782 stretched between the link 770 and the arm 774 urges the link toward rearward position and the bellcrank lever 773 toward counterclockwise position. Link 775 is pivotally connected at its lower end to a rocker plate 776 which is fulcrumed to the left side of the addressor frame, and pivotally supports the rear end of a shoe 777. This shoe 777 is rockably supported at its forward end by a rockable arm 778, also pivotally mounted on the addressor frame for oscillation between an upper and a lower position, respectively, while remaining horizontal. This shoe is positioned above the rear plunger 241 of the powerplant. It will be recalled from the description of the pow-

erplant that depression of the plunger 241 trips the main clutch of the powerplant to start the machine on a cycle of operations. It follows, therefore, that in response to forward movement of the link 770 the main clutch is tripped, and since the forward movement of link 770 also locks the printing head against downward movement, the machine is operated to feed plates without printing from them.

It is sometimes desired to manually control the addressor to feed plates through the machine without printing from them, and such operation may be effected by shifting the link 770 forwardly in either of two ways, (1) by directly rocking the lever 780; or (2), by pulling shoe 777 downwardly. Pulling shoe 777 downwardly is effected by means of the slide 277, previously mentioned, which overlies the shoe and is pulled downwardly in response to depression of the left pedal 262 of the machine.

Rocking movement of the lever 780 to pull the link 770 forwardly is accomplished by depressing a plunger 783 in the front wall of the printing head bracket 452, which plunger is aligned with the upper end of lever 780. The plunger is normally maintained in forward position by compression spring 784 compressed between a collar on the plunger and one of the supporting bearings.

When, during manual operation, it is desired to print, the right pedal 261 (Fig. 1) is depressed, which, as previously described in connection with the powerplant, depresses the rear plunger 241. Depression of the plunger 241 by the right pedal does not depress the shoe 777, and therefore the link 770 remains in rearward position in which it does not lock the printing head.

Recapitulating: So long as the right pedal is held depressed, the machine will operate through successive cycles to print. However, so long as the left pedal 262 is held down, or the plunger 783 is held in, the machine will operate through successive cycles and will feed plates through the machine, but will not print from them.

Fig. 15 shows the plunger 241 raised and the link 770 in rear position in condition for normal printing operation of the machine. Fig. 15a shows the plunger 241 depressed and the link 770 in forward position for operation of the machine without printing. The parts may be held in the position shown in Fig. 15a either by depression of the left pedal or depression of the plunger 783. In Fig. 15a the parts happen to be held in the position indicated, by the left pedal.

Printing head interlocks

It is also sometimes necessary to disable the printing mechanism during automatic operation of the machine, in response to certain predetermined conditions. Such automatic control is effected by the 4-arm bellcrank lever 745, previously mentioned, and a 3-arm bellcrank lever 801, which is fulcrumed coaxially with lever 745. Suffice it to say at this time that the bellcrank lever 745 includes an upwardly extending arm 785 and the bellcrank lever 801 includes an upwardly extending arm 892, the upper ends of which arms 785 and 892 are positioned back of the pin 779 in the forward end of the link 770 so that in response to clockwise (with reference to Fig. 78) rocking movement of either the bellcrank lever 745 or the bellcrank lever 801, the link 770 will be moved forwardly to disable the printing head.

The 4-arm bellcrank lever 745 is controlled by the plate selection mechanism to disable the

printing head in a manner to be described later in connection with the selection mechanism.

The 3-arm bellcrank lever 801 is responsive to the presence or absence of plates in the selection and printing stations to disable the printing head when conditions are such that there is no printing plate in the printing station at the printing time, in a manner to be described next.

As just indicated, the bellcrank levers 745 and 801 are adapted to be rocked clockwise in response to certain conditions of the machine to prevent operation of, or disable, the printing head. One condition under which the printing head should be disabled is that of no printing plate being in printing position. In the actual operation of the machine, the printing operation is timed to occur very early in the cycle. Furthermore, during normal operation, a plate is advanced from the magazine into the selection station and the plate previously in the selection station is advanced into the printing station, during the last half of each cycle. The mechanism for determining whether or not the printer head shall function in any given cycle is made responsive to presence of a plate in the selection station during the preceding cycle and in the printing station during the instant cycle.

The mechanism for rocking the bellcrank lever 801 includes a bar 786 (Figs. 20, 78) which is pivotally secured at its rear end of a clevis 787 on the arm 738 of the oscillatory shaft 538 which, as previously described, is positively rocked during each revolution of the addressor main drive shaft. The forward end of the bar 786 is supported for longitudinal movement by a pair of flanged rollers 788 pivotally supported on the left frame member of the addressor.

It will be apparent from the foregoing description that the bar 786 reciprocates once during each cycle of operation of the machine. Furthermore, the bar is in extreme forward position, as shown in Fig. 20 in full cycle position, and moves rearwardly during the first half of each cycle and forwardly during the second half.

Pivotally mounted on the bar 786 is a pawl lever 789 (Fig. 20), which is normally maintained in the position shown in Fig. 71 by a compression spring 790 compressed between the right end of the pawl lever and a pin 791, the limit position being determined by contact of a shoulder 792 on the pawl lever, with the pin 791.

It will be observed from Fig. 20 that when the machine is in full cycle position, the bar 786 is in extreme forward position, and the rear end of the pawl lever 789 is positioned immediately in front of the lower end of an arm 793 on the bellcrank lever 801. Very early in the cycle, the rearward movement of the bar carries the pawl lever against the arm 793 and rocks the bellcrank lever clockwise into disabling position. As has been previously stated, the printing movement of the printer head is timed to occur very early in the cycle, and occurs before the pawl lever 789 engages the arm 793. However, the movement of the bellcrank lever 801 by the pawl lever 789 in one cycle, conditions the printing head for the next cycle. Thus during each rearward movement of the bar 786 the pawl lever 789 rocks the bellcrank lever 801 from the position shown in Fig. 71 into the position shown in Fig. 62, at which time the pawl lever 789 is rocked counterclockwise to disengage from the arm 793 by a stationary block 794, which intercepts the right end of the pawl lever and cams it upwardly. If conditions are such that the printing head should

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print in the next cycle, the bellcrank lever 801 is immediately returned to its normal position (against a stop pin 893), as shown in Fig. 71, by a spring 804.

However, assume that at the time in the early part of the cycle when the bellcrank lever 801 has been rocked clockwise, as described, there is no plate in the selection station of the addressor. This means that during the next cycle there will be no plate in the printing station and the printing head should be disabled.

Thus referring to Fig. 56, a lever 795 is fulcrumed at 796 on the left frame member of the addressor for swinging movement of its forward end into and out of the path of the plates moving through the selection station. The lever has a roller 797 on the underside of the said end, and the upper face of the spacer member 563 is recessed to pass the roller when it swings into the path of the plate. The lever 795 is urged counterclockwise by a torsion spring 793 so that the roller 797 lies in the path of the plate moving through the selection station except when it is moved outward by contact with such a plate. Thus in Fig. 56 the lever occupies the position shown in solid lines when a printing plate is in the selection station, and occupies the dotted line position when there is no printing plate in the selection station.

The rear end of lever 795 carries a downwardly depending pin 799. When the lever 795 is in the normal or full line position (Fig. 56) the pin 799 is clear of the path of an arm 800 on the 3-arm bellcrank lever 801. However, when there is no plate in the selection station of the machine, the lever 795 can be moved by its torsion spring into the dotted line position shown in Fig. 56, and the pin 799 tends to move into the path of the arm 800.

So long as there is a plate in the selection station of the machine, and the lever 795 is maintained in the full line position of Fig. 56, the pin 799 extends alongside of the arm 800 of the 3-arm bellcrank lever 801. Therefore, if a plate in the selection station is moved out of the selection station and is not replaced by a new plate, the lever 795 is restrained from immediately moving into the dotted line position of Fig. 56 by contact of the side of the pin 799 against the arm 800.

However, when the bellcrank lever 801 is rocked, as previously described, by the pawl lever 789 on the bar 786, the pin 799 slips above the arm 800 and prevents the counterclockwise return of the bellcrank lever 801 under the influence of the spring 804. Therefore, if, in any cycle there is no plate in the selection station, the bellcrank lever 801 will be moved into and locked in counterclockwise position, holding the link 770 in forward position during that cycle. Furthermore, since the movement of plates occurs only during the latter part of each cycle, after the printing time, if there was no plate in the selection station at the end of one cycle, there will still be no plate in the selection station during the fore part of the next cycle, and the printing head will be held disabled to prevent a printing operation. On the other hand, when, in a succeeding cycle, a printing plate is moved into the selection station, the lever 795 will be rocked to carry the pin 799 to one side of the arm 800 so that the pin 799 is no longer effective to hold the bellcrank lever 801 and the link 770 in printer-disabling position, and a printing operation will then take place in the succeeding cycle unless such operation is prevented by an additional interlock, next to be described.

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During continuous operation of the machine, when there are plates in both the selection station and the printing station, the mechanism described, under the control of the plate-actuated lever 795, would function alone to permit a printing operation during each cycle. Furthermore, if, at any time during such operation, a plate fails to move into the selection station, the mechanism described will function to prevent a printing operation during the succeeding cycle when there would be no plate positioned in the printing position.

However, the mechanism described, including only the plate-responsive lever 795, would not function to prevent the operation of the printing head at the start of operations during that cycle when the first plate has been moved into the selection station, and no plate has yet reached the printing station. This is for the reason that the movement of a plate into the selection station moves the pin 799 out of engagement with the arm 800, permitting the restoration of the bellcrank lever and the link 770 to normal inactive position, despite the fact that there is no plate in the printing position during that cycle and during the fore part of the succeeding cycle when the printing time occurs. To take care of this situation and prevent the operation of the printing head during the cycle prior to the feeding of the first plate into the printing station, an additional lever 795a identical with the lever 795, but positioned to be actuated by plates in the printing station, is provided. This lever 795a has a pin 799a which cooperates with the arm 800 exactly the same as does the pin 799; and the pin 799a will block the return of the arm 800 whenever there is no plate in the printing station.

It will be apparent, therefore, that in order for a printing operation to take place in any cycle, there must be a plate in the printing station. Furthermore, during continuous feeding of the printing plates through the machine, both the pin 799 and the pin 799a will be in position to prevent the upward return of the arm 800, and will insure the operation of the printing head. However, if the lever 795a and the pin 799a were omitted, the printing head would print at the beginning of operations while the first plate was still in the selection station, one cycle before it reaches the printing station. Also, if the lever 795 and the pin 799 were omitted, the printing head would operate to print during the cycle following the departure of the last plate from the printing station. The use of the dual set of levers operated by plates in both the selection station and the printing station, prevents any possible operation of the printing head when there is no plate in the printing station.

MANUALLY CONTROLLED REPEAT MECHANISM

In ordinary operation, plates are fed through the machine on every cycle and only one envelope is printed from each plate. However, it is sometimes desirable to be able to print an indefinite number of envelopes from the same plate, and a manually controlled repeat mechanism is provided to permit such operation. This mechanism must disable the plate-feeding mechanism so as to leave the same plate in the printing station during successive cycles, and must insure that the printing head will not be disabled.

The repeat mechanism is controlled by a repeat handle 805 (Fig. 1) projecting through a slot in the control panel and movable between a lower position opposite the legend "Repeat" and an

upper position opposite the legend "Off." Referring now to Fig. 20, this handle 805 constitutes one arm of a bellcrank lever 806, fulcrumed to the left side frame member of the addressor at 807 and having a downwardly depending arm 808 pivotally connected to the forward end of a link 809. The rear end of link 809 is pivotally connected to the end of an arm 810 which is pivotally supported on the left side frame member of the addressor. When the arm 810 is rocked rearwardly by movement of the repeat handle 805 into "Repeat" position, the upper end of the arm engages a pin 811 (Fig. 77), which is fixed to a substantially horizontally extending link 812 intermediate the ends thereof, and shifts the link 812 rearwardly.

At its forward end, link 812 carries a horizontally extending pin 813 which projects laterally through arcuate slots in a pair of bellcrank levers 814, 815 respectively, both of which are fulcrumed at 816 to the left frame member of the addressor. The bellcrank lever 814 has a rearwardly extending arm 817 which extends below both the pawl lever 789 and a similar lever 818 fulcrumed coaxial with pawl lever 789 and which cooperates with the 4-arm bellcrank lever 745 in the same way that the pawl lever 789 cooperates with the 3-arm bellcrank lever 801.

The rearward movement of the link 812 rocks the pawl levers 789 and 818 counterclockwise so that they clear the arms 793 of the 3-arm bellcrank lever 801 and the corresponding arm 819 on the 4-arm bellcrank lever 745. Therefore neither of the bellcrank levers 745 and 801 can be actuated, in response to rearward movement of the bar 786, to disable the printer.

The bellcrank levers 814 and 815 are yieldably urged counterclockwise by tension springs 820 and 821, respectively, stretched between the rearwardly extending arms of the bellcrank levers and a link 822 positioned therebelow.

At its rear end, the link 812 is pivotally connected to an upwardly extending arm 823 on a sleeve 824, which is rotatably supported on a stub shaft 825 extending from the left side frame of the addressor. Secured to the sleeve 824 back of the arm 823 (with reference to Fig. 77), is an arm 826 which arm is pivotally connected to the lower end of a link 827. This link extends upwardly and rearwardly between two guide screws 828 on the addressor frame, and has at its upper end a laterally extending pin 829 extending immediately in front of the lock arm 541, which, as previously described, connects the actuating arm 537 associated with the plate-feeding mechanism, to the yoke 539 on the main rock shaft 538. Rearward movement of the link 812 shifts the pin 829 upwardly and rearwardly to disengage the lower end of the lock bar from the cooperating shoulder 543 on the actuating arm, thereby disabling the plate-feeding mechanism.

Summarizing: Movement of the repeat handle 805 into "Repeat" position, shifts the pawl levers 789 and 818 into inactive positions with respect to the 4-arm bellcrank lever 745 and the 3-arm bellcrank lever 801, respectively, so that the printing cannot be disabled, and at the same time shifts the lock arm 541 to disable the plate-feeding mechanism, so that the machine will continue to print successive envelopes from the same printing plate as long as it is operated with the repeat handle 805 in repeat position.

MULTICATING MECHANISM

The repeat handle 805 and its associated mech-

anism just described, permits manual setting of the machine to print envelopes from the same plate indefinitely. However, it often happens that it is desirable to print a predetermined number of envelopes from each printing plate, and a multicating mechanism is provided for automatically disabling the plate-feeding mechanism at such intervals as to permit a desired number of envelopes to be printed from each plate before it is replaced by a new plate.

This multicating mechanism includes, as control elements, a rotatable knob 830 and a handle 831 mounted on the control panel of the addressor (Figs. 1 and 20). The knob 830 is rotatable into any one of a plurality of positions (15 in number in the particular machine disclosed), and the knob has secured thereto, back of the panel, a disc 832 having on its front face a row of numbers from 1 to 15, one of which numbers is displayed through a window 833 in the control panel. The number displayed indicates the number of envelopes that will be automatically printed from each plate. The multicator handle 831 is movable between a lower "Off" position, in which the multicating mechanism is disabled, and an upper "Multicate" position in which the multicating mechanism is enabled. This lever provides an easy method of throwing the multicating mechanism in and out of operation without changing the setting of the knob 830.

The knob 830 is secured to the forward end of a shaft 834 supported in bearings 835 in the left frame member of the addressor. This shaft has a set of radially extending pins 836 arranged in a helical row about the shaft, and one of these pins, the particular one depending upon the position of rotation of the shaft, is adapted to cooperate with a stop 837 on the upper end of a lever 838 (Figs. 77, 78) fulcrumed on the forward end of a ratchet rack 839. This rack 839 is mounted for fore and aft sliding movement in guides 840 on the addressor frame, and is urged rearwardly by a tension spring 841. It has a row of ratchet teeth 842 on its upper edge, cooperating with an actuating pawl 843 and a retaining pawl 844.

The retaining pawl 844 is pivotally supported by a pin 845 on the frame of the machine, and it is yieldably urged in clockwise direction to engage with the rack, by a tension spring 846. The actuating pawl 843 is pivotally supported by a pin 847 on the lower end of a lever 848 fulcrumed at 849 to the frame of the machine. The pawl 843 is urged clockwise toward the rack, by a tension spring 850. The lever 848 has at its upper end a pin 851 (extending rearwardly with reference to Figs. 77, 78) adapted to engage in a notch 852 of a driving arm 853, which is pivotally supported at its rear end at 854 on the bar 786.

The arm 853 is urged clockwise to engage the notch therein with the pin 851 by a tension spring 855. The bar 786, as previously described, is reciprocated once during each revolution of the addressor main shaft.

When the driving arm 853 is positioned to engage the notch therein with the pin 851, the multicator mechanism is driven from the bar 786. When the multicator is not in use, the driving arm 853 is held clear to the pin 851 by a mechanism controlled by the multicator handle 831. Thus referring to Fig. 76, the multicator handle 831 constitutes a forwardly extending arm on a bellcrank lever 856 having an upwardly extending arm 857 pinned to the forward end of a link 858. The rear end of link 858 is pinned to the lower end of a lever 859, which is fulcrumed in-

intermediate its ends at 860 to the frame of the machine. The upper end of the lever 859 is pinned to the forward end of a link 861, and the rear end of the link is pinned to the downwardly extending arm of the bellcrank lever 862. This bellcrank lever 862 has a rearwardly extending arm 863 which has a pin 864 thereon adapted to be moved against the forward end of the driving arm 853. Thus referring to Fig. 20, when the multicater handle 831 is in "Off" position, the pin 864 is positioned in line with the driving arm 853 so that during forward reciprocation of the bar 786 an inclined forward end 865 on the driving arm 853 engages the pin 864 and rides up over the pin, thereby carrying the notch portion of the under surface of the driving arm clear of the pin 851 so that the lever 848 is not engaged and moved.

However, when the multicater handle 831 is in the upper "Multicate" position, the pin 864 is carried into position below the driving arm 853, as shown in Fig. 76, so that the notch in the driving arm is engaged by the pin 851 and the lever 848 is rocked with the bar 786. During the first half of each cycle, the main drive bar 786 is reciprocated rearwardly, thereby rocking the lever 848 counterclockwise (with reference to Fig. 76). This advances the actuating pawl 843 into engagement with one of the teeth of the rack 839, and advances the rack forwardly. On the succeeding rearward movement of the bar 786, during the second half of the cycle, the actuating pawl 843 is retracted and the rack is restrained against return by the retaining pawl 844, so that the pawl and rack mechanism functions to advance the rack 839 one tooth during each cycle of operation of the machine. Therefore the rack is carried forwardly a definite distance during each cycle of operation, and at the end of a definite number of cycles, determined by the setting of the knob 830, will carry the stop 837 against one of the radial pins 836, which functions to trip the pawls and permit return of the ratchet rack 839 by the spring 841.

When the ratchet rack 839 is in rearmost position, the plate-feeding mechanism operates in the usual manner to feed plates through the machine. However, so long as the rack 839 is advanced out of its normal position, the plate-feeding mechanism is disabled. Thus the rack 839 carries a cam member 865, which member has its forward end normally positioned immediately back of a lower extension 866 on the arm 823 which arm, as previously described, is connected by the sleeve 824 and the arm 826 to the link 827 which disengages the lock arm 541. As soon as the ratchet rack 839 is advanced forwardly out of its normal position, the cam member 865 engages the extension 866 on the arm 823, rocking the latter to disengage the lock arm 541 and thereby disable the plate-feeding mechanism. Furthermore, as the rack 839 feeds forwardly, the cam member 865 maintains the arm 823 rocked counterclockwise to maintain the plate-feeding mechanism in disabled condition. It will be observed, therefore, that the number of cycles during which the plate-feeding mechanism is disabled, is determined by the distance the ratchet bar 839 is advanced before it is tripped, which, in turn, is determined by the position of rotation of the knob 830 and the shaft 834, carrying the radial pins 836.

The specific mechanism for tripping the ratchet rack in response to engagement of the stop 837 against one of the radial pins 836 will now

be described while following through the operation of the mechanism: Assuming that the ratchet rack 839 is in its normal rearward position, and that the multicater handle 831 is in the upper or "Multicate" position, the ratchet rack 839 is advanced one tooth length at a time during each cycle until near the end of the first half of the cycle corresponding to the setting of the knob 830; at which time the stop 837 engages one of the pins 836. This rocks the lever 838 counterclockwise against the force of a tension spring 868 until a shoulder 867 on the lower end of the lever 838 disengages the lower end of an arm 869 fulcrumed near its middle at 870 to the ratchet rack 839 and pivotally connected at its upper end to the front end of a pawl release bar 871. This pawl release bar is supported at its rear end on the ratchet rack 839 by an arm 872 for swinging movement parallel to the ratchet rack 839 from a lower position, as shown in Fig. 78 in which its upper edge is below the level of the teeth 842 in the ratchet rack 839, to an upper position above the teeth, as shown in Fig. 77. Furthermore, the actuating pawl 843 and retaining pawl 844 overlie both the rack 839 and the pawl-release bar 871 so that when the latter moves into uppermost position it carries the pawls out of engagement with the ratchet rack, permitting the rack to be returned to normal position by its spring 841. The pawl-release bar 871 is urged into uppermost position by a tension spring 873 so that it moves into the upper position immediately upon disengagement of the arm 869 in response to tripping movement of the lever 838.

During the last half of the cycle in which the ratchet rack was released, the forward movement of the reciprocating bar 786 causes a pawl 874, pivoted thereon at 875 (Fig. 77), to carry the upper end of a lever 876 forwardly, rocking the lever clockwise. This lever 876 is fulcrumed at 849 and its lower end has an adjusting screw 877 therein which engages the upper surface of the pawl release bar 871 and forces it downwardly until the shoulder 867 on the lever 838 engages the lower end of the arm 869 and locks the bar in its lower position, in which it is clear of the actuating pawl 843 and the retaining pawl 844 and the latter are in cooperative relation with the ratchet rack 839. The lever 876 is urged counterclockwise by a tension spring 878 into a limit position determined by a stop 879.

During the first half of each cycle of operation, when the bar 786 is moving rearwardly, the nose of the pawl 874 rides up over the upper end of the lever 876 and is snapped into engagement therewith by a tension spring 880. Near the end of the forward movement of bar 786, after the lever 876 has been rocked clockwise a sufficient distance to release the pawl release bar 871, the right end (with reference to Fig. 76) of the pawl 874 rides under a stationary pin 881 and is cammed clockwise by the pin to disengage the upper end of the lever 876.

The last envelope of each series printed with the same address, when multicating, is printed in the cycle following release of the ratchet rack 839. As previously mentioned, the printing operation occurs very early in the cycle. Furthermore, at the beginning of this last cycle since the ratchet rack 839 is in rearmost or normal position, the plate-shifting carriage 531 is retracted rearwardly and during the last half of the cycle is advanced to carry a new plate into the printing station, so that the first envelope is printed from the new plate in the second cycle following

the release of the ratchet rack 839. Furthermore, in the first cycle following the release of the ratchet bar 839, it is again moved out of normal position by the actuating pawl 843 to again disable the plate-shifting carriage 531 so that in only the one cycle directly following the cycle in which the ratchet rack 839 is released, is the plate-shifting mechanism enabled to shift a new plate into the printing station.

It will be noted that the arm 823 which controls the disabling of the plate-feeding mechanism, is under the joint control of the repeat handle 805 and the cam member 865 on the ratchet rack 839, so that if the multicater handle 831 is in "Multicate" position and the repeat handle 805 is in "Repeat" position, the latter lever maintains the arm 823 in counterclockwise position so that it is out of control of the ratchet rack 839 and the multicating system is not effective; hence the machine will continue to print from the same plate so long as the repeat handle 805 is in "Repeat" position, irrespective of the position of the multicater handle 831.

There is secured to the shaft 834 a ratchet wheel 834a cooperating with a pawl 834b which prevents clockwise rotation of the shaft 834. This is to prevent the operator from inadvertently rotating the knob 830 clockwise. The helical row of pins 836 extends about the shaft 834 in the form of a right-hand thread and if the shaft 834 were to be rotated clockwise at a time when the ratchet rack 839 is in an advanced position, one of the pins 839 might be carried into position directly back of the stop 837, thereby preventing return movement of the ratchet rack into normal position. However, by restricting rotation of the knob 830 to its counterclockwise direction, all possibility of any of the pins 836 being moved into a position back of the stop 837 is eliminated. So long as rotation of the shaft 834 is limited to the counterclockwise direction, any rotation of the shaft that will bring one of the pins 836 into contact with the stop 837 of the ratchet rack 839 will contact the front end of the stop 837, thereby tripping the rack.

SELECTION MECHANISM

Reference has already been made to a selection station through which all plates pass during transit from the plate magazine to the printing station. While each plate is in the selection station it may cooperate with a selection mechanism to determine whether or not that particular plate shall be printed from.

Thus it is often desirable, in an addressing machine, to classify address plates for different purposes. For instance, it may be desirable to send out notices to every addressee on a certain date and on other dates send out notices to only certain specified addressees. On still another date it may be desirable to send out notices to still another group of addressees. The address plates can be segregated into different classes and each class identified in a particular way. In the present machine the different classes of address plates are distinguished apart by tabs secured in different positions along one edge of the address plates, and a selection mechanism is incorporated in the addressing machine which responds selectively to the differently positioned tabs on the address plates.

Referring to Fig. 25, each plate 455 may be of standard construction comprising a frame member 882 having bent over lips for retaining an embossed address plate 883 and a printed

address card 884. The portion of the frame plate 882 adjacent the upper edge and back of the address card 884 is slotted and formed to receive the shanks 885 of selection tabs 886 (Fig. 75); each tab having an operating portion extending above the edge of the plate.

Referring to Fig. 25, it will be observed that there are three different types of tabs illustrated. Thus two of the tabs, 886a, are termed "Full" tabs, and the tabs 886b and 886c are termed half tabs and tab 886b is reversed with respect to tab 886c.

Referring to Fig. 58, it will be observed that each frame plate 882 is stamped to provide 12 receptacles for the shanks of the tabs so that any tab can be positioned in any one of 12 different positions on the plate. Furthermore, by employing half tabs and reversing them, half tabs may be positioned in any one of 24 positions along the edge of the plate.

Referring now to Fig. 61, a plate in the selection station is so positioned that a tab thereon extends above a straight row of 24 selection holes 887 in the spacer member 563, on which the printing plates rest, and through which selection pins are adapted to project. These pins may vary in number and are supported in apertures 888 in a rock bar 889.

Referring to Fig. 61, each pin 890 has a head 891 which retains the pin against downward movement through the apertures 888.

During operation of the selector, the rock bar 889 is rocked downwardly, and if there is no tab in the path of the pins 890 the pin enters into juxtaposed selection holes 887 therebelow. However, if at the time the rock bar 889 is moved downwardly the pins 890 encounter a selection tab on the plate in the selection station, these pins are stopped, while the rock bar moves down therepast, the resultant relative movement between the pins and the rock bar forcing the pins upward away from the rock bar. The heads of the pins cooperate with juxtaposed arm plates 892 and 893, respectively, adjustably mounted on square bars 894 and 895, respectively, and the relative movement between pins 890 and the rock bar 889 is transmitted to the square bars 894 and 895 to control the printing mechanism. The rock bar 889 is connected to a rigid frame member 889a which has supporting arms 896 and 897 (Figures 87 and 88 at the left and right ends, respectively). The right arm 897 is pivotally connected by a pin 898 to a bracket 899 on the right side of the addressor frame. The arm 896 is pivotally supported on the same pin 746 that fulcrums the 3-arm and 4-arm bellcrank levers 801 and 745, respectively. This pin 746 is coaxial with the pin 898.

The rock bar frame 889a is coupled at its left end to an actuating arm 900 which is pivotally mounted on the pin 746. A compression spring 901 compressed between a lug 902 on the arm 900 and a lug 903 on the rock bar frame 889a normally maintains a stop finger 904 on the arm 900 against a stop shoulder 905 on the rock bar frame 889a. This spring 901 is relatively stiff and is not compressed during normal operation of the machine. However, it can yield in response to excessive forces resulting from abnormal operation of the machine. Hereinafter in the discussion the arm 900 will be considered as a unit with the rock bar frame 889a.

The arm 900 is normally maintained in counterclockwise position against the stop pin 803 (Fig. 76) by a tension spring 906 stretched between a

pin 907 on the arm 900 and the frame of the machine. When the arm 900 is against the stop pin 803, the rock bar is in normal, or upper position, as shown in Fig. 61. The arm 900 is rocked clockwise to carry the rock bar into lower or selecting position, by a pawl lever 908 (Figs. 64, 87) which lever is identical with the pawl levers 789 and 818 and is pivotally mounted coaxial therewith on the reciprocatory drive bar 786, which, as has been previously described, reciprocates during each cycle of operations.

When the selection mechanism is in operation the rear end of the lever 908 intercepts arm 900 during the rearward movement of the bar 786 in the early part of each cycle, and carries the lower end of the arm rearwardly into the position shown in Fig. 64, which carries the rock bar 889 into full lower position. This movement is completed substantially at the end of the first quarter of the cycle, at which time the tail end of the pawl lever 908 rides up onto the block 794, tripping the nose of the pawl lever away from the arm 900 and releasing the latter, whereupon the arm and the rock bar are returned by the tension spring 906.

When the selection mechanism is not to be employed, it is disabled by rocking the pawl lever 908 counterclockwise so that the path of travel of its nose is below the arm 900. This mechanism is actuated by a selection handle 909 (Figs. 1, 20) which projects through a slot in the control panel, and is movable from a lower "off" position through an intermediate "select" position (as shown in Fig. 60) and into an upper "Bell" position. This handle 909 constitutes one arm of a bellcrank lever 910 fulcrumed on the same fulcrum pin 807 as the bellcrank lever 806. Lever 910 has a downwardly extending arm pivoted at its lower end to the forward end of a link 822, which is supported at its rear end by pivotal connection to an arm 912, which arm is rotatably supported on the frame of the machine. When the selection handle 909 is in lowermost or "off" position the link 822 is shifted rearwardly to carry a finger 913 thereon against a downwardly depending arm 914 on the bellcrank lever 815, thereby rocking the bellcrank lever 815 clockwise to carry the rearwardly extending arm 915 thereon up under the tail end of the pawl lever 908 and swing the latter into inoperative position.

The bellcrank lever 815 has a lip 916 thereon which, when the lever 815 is rocked clockwise, as last described, engages a shoulder 917 on the bellcrank lever 814 which disables the pawl lever 818 associated with the 4-arm bellcrank lever 745. However, when the selection handle 909 is moved into intermediate or "Select" position, the finger 913 on link 822 is carried forwardly out of engagement with the arm 914, so that the pawl levers 908, 811 and 789 are released into their operative positions. Thereafter, during each cycle of operations, the arm 900 is rocked clockwise to lower the rock bar 889, and the 4-arm and the 3-arm bellcrank levers 745 and 801, respectively, are rocked into their clockwise positions. As has been previously explained, both of these multi-arm bellcrank levers act on the printing head mechanism to determine whether or not it shall print. The 3-arm bellcrank lever 801 functions to prevent the printer head from operating when there is no printing plate in the printing station at the printing time. The 4-arm bellcrank lever 745 functions in response to the operation of the selection mechanism to pre-

vent operation of the printing head in response to plates bearing selection tabs in particular positions.

It will be recalled that the 3-arm bellcrank lever was rocked clockwise by the associated pawl lever 789 and then retained in clockwise position by the plate interlock mechanism if a plate is not in printing station. On the other hand, if conditions are such that a printing plate will be in the printing station at the printing time, then the 3-arm bellcrank lever is returned to counterclockwise position upon its release by the bellcrank lever 789. In other words, the operation of the printer was prevented only when the 3-arm bellcrank lever, after being rocked into clockwise position by the pawl lever 789, was retained in clockwise position by a holding mechanism. Similarly, the 4-arm bellcrank lever 745 prevents operation of the printer only when it is retained in clockwise position (after being rocked into that position by the pawl lever 818) by the selection mechanism.

The manner in which the selection mechanism may function to retain the 4-arm bellcrank lever 745 in clockwise position, will now be described:

It will be recalled that in the forepart of the description of the selection bar and associated elements, it was explained that if during downward movement of the rock bar 889 the pins 890 encounter a tab on a printing plate in the selection station, then the pins remain stationary, while the bar moves downwardly therepast. It was also pointed out that the heads of the pins rest against a pair of arm plates 892 and 893, respectively, on a pair of square bars 894 and 895. Therefore upward movement of the pins 890 relative to the rock bar 889, rocks the square bars 894 and 895 relative to the rock bar frame 889a (Figs. 64, 65).

The rear square bar 895 has round bearing sections at its opposite ends, which bearing sections are supported in bearing members 918 and 919 on the rock bar frame 889a. The front square bar 894 is secured at its opposite ends to a pair of arms 920 and 921, respectively, which in turn are pivotally supported at their rear ends on the round end portions of the rear square bar 895. Therefore the arm plates 892 and 893, which contact the pins 890 are rotatable about the axis of the rear square bar 895. To yieldably urge the front square bar 894 clockwise (with reference to Fig. 62), and maintain the arm plate 892 against the head of a pin 890, a compression spring 922 (Fig. 56) is compressed between a rear extension 923 of the arm 920 and the lug 903 on the rock bar frame 889a. Likewise, to urge the rear square bar 895 clockwise, a compression spring 924 is compressed between the lug 903 and a rear extension 925 of an arm 926 secured to the left end of the rear bar 895.

The arms 926 and 920 (Fig. 56) are laterally spaced from each other and a third arm 927 is interposed therebetween, this arm being freely pivoted on the cylindrical end of the rear square bar 895. It is adapted to be moved upwardly in response to upward movement of both of the arms 926 and 920, but not in response to movement of only one of those arms.

Thus the arm 927 has a hole 928 extending laterally therethrough which hole contains a ball 931 having a diameter slightly greater than the thickness of the plate 892, so that, when the ball is centrally positioned, it projects from each side of the plate into the path of a pair of sloping

shoulders 929 and 930 on the arms 926 and 920, respectively. Obviously, if both of the arms 920 and 926 move upwardly simultaneously, the shoulders 929 and 930 both engage the ball 931 (Fig. 64A) so that the arm 927 is constrained to move upwardly with the arms 920 and 926 (the movement being with respect to the frame members 889a as shown in Fig. 64). On the other hand, if one of the arms, say arm 920, is first rocked upwardly while the arm 926 remains stationary, then the shoulder 930 on the arm 920 forces the ball 931 into the hole 928, permitting free upward movement of the arm 920 relative to the arm 926. (Fig. 66.)

To prevent any upward movement of the arm 927 resulting from frictional drag between the ball 913 and the shoulder 930, the arm 927 has a pin 932 extending therethrough which engages against the underside of the shoulder 929 on the arm 926.

Since the mechanism is symmetrical on both sides, it will be apparent that upward movement of the arm 926 without corresponding upward movement of the arm 920 will also fail to lift the arm 927.

As already indicated, the arm 927 is pivotally supported on the rock bar frame 889a, so that the upward movement mentioned is a movement relative to the rock bar 889. Actually, the movement described occurs during downward movement of the rock bar.

Assuming that the pins 890 are not intercepted by a tab on a plate in the selection station, there is no movement of the arms 920 and 926 relative to the rock bar and no relative movement between arm 927 and the rock bar, and the latter rotates with the rock bar about the axis of pin 746, carrying the arm 927 into the position shown in Figs. 69 and 70. However, if the pins 890 are intercepted by a tab on a plate in the selection station, then the rotation of the arms 920 and 926 with the rock bar as a unit is prevented, and, during the final downward movement of the rock bar, the arms 920 and 926 and the arm 927 rock counterclockwise relative to the rock bar, with the result that the arm 927 is moved into the position shown in Figs. 64 and 65.

If only one of the two pins 890 is intercepted by a tab on a printing plate, then the arm 927 moves with the rock bar as a unit, as was the case when neither pin was intercepted. This operation is shown in Figs. 66 and 67, and necessarily follows from the fact that movement of both the arms 920 and 926, relative to the rock bar, is necessary to produce relative movement of the arm 927.

The position of the arm 927 determines whether or not the 4-arm bellcrank lever 745 will be retained in clockwise position to disable the printing head.

The arm 927 cooperates with a mechanism, which will be described subsequently, to cause the selection mechanism to function in either of two ways: (1) to print from those plates having a tab in position to intercept the pins 890, and (2) to print all plates except those having a tab positioned to intercept the pins 890.

Referring to Fig. 60, the selection mechanism is illustrated in position at the beginning of a cycle, with the selection handle 909 adjusted to "Select" position. One-quarter cycle later the apparatus is in the position shown in Fig. 62, in which the pawl lever 818 has engaged the lower arm 819 of the 4-arm bellcrank lever 745 and has rocked the latter almost into its full

clockwise position. Furthermore, at this time the rock bar 889 (Fig. 63) has carried the pins 890 into position to contact the tab on a printing plate in the selection station. Slight further movement of the pawl lever 818 will carry it past the arm 819, releasing the 4-arm bellcrank lever unless it is retained by the locking mechanism to be described. At this time the rock bar 889 has moved substantially into its lowermost position (Fig. 65) and the selection pins 890 have restrained the downward movement of the arm plates 892 and 893 so that the arm 927 has been moved into the position shown in Fig. 64.

The arm 927 carries at its lower end a contact screw 933 which is adapted to contact a face 934 on the upper end of an upwardly extending arm 935 pivotally supported at its lower end on a stationary pin 936. The arm 935 is adapted to rock between a clockwise position, as shown in Fig. 64, in which it lies against a stop pin 937 and a counterclockwise position as shown in Fig. 69, in which it lies against the stop pin 938. At its upper end (Fig. 62) the arm 935 is pinned to the forward end of a link 939, which extends rearwardly and is pinned at its rear end to the midportion of a latch pawl 940 by a pin 941. The latch pawl is pivotally suspended at its upper end from an offset portion 942 of the rearwardly extending arm 744 of the 4-arm bellcrank lever 745. A tension spring 943 stretched between the pivot pin 941 and the pivot pin 936 urges the link 939 forwardly and the arm 935 clockwise against the stop 937. The spring 943 also applies a downward component to the pin 941 urging the 4-arm bellcrank lever counterclockwise.

The latch pawl 940 cooperates with a stop segment 944, which depends from a stationary pivot pin 945 and has at its lower end a rear shelf 946 and a front shelf 947 spaced from each other and extending outwardly into the plane of the pawl 940. When the 4-arm bellcrank lever is in clockwise position, the lower end of the latch pawl 940 is above the level of the shelf 946 and the shelf 947, as shown in Fig. 62. The stop segment 944 is pivotally connected at 948 to the rear end of the link 949, which is pinned at its front end to an upwardly extending arm 950 of a bellcrank lever 951 fulcrumed on the same pin 693 which supports the bellcrank lever 686 associated with the numbering printer. This bellcrank lever 951 has a forwardly extending arm 952 constituting a handle extending through a slot in the control panel and movable between an upper "Skip tab" position (Fig. 1) and a lower "Print tab" position. When the handle 952 is in upper "Skip tab" position the selection mechanism is conditioned to skip plates having tabs positioned to intercept the pins 890 and print from all other plates, and when the handle 952 is in lower "Print tab" position the selection mechanism is conditioned to print from plates having tabs positioned to intercept the selection pins 890, and to skip all other plates.

Referring back to Fig. 62, when the handle 952 is in "Print tab" position, the link 949 is in extreme forward position in which the rear shelf 946 is positioned back of the latch pawl 940 and the front shelf 947 is positioned in front of the latch pawl.

Under these conditions, when the pawl lever 818 slips past the end of the arm 819 in response to further rearward movement of the reciprocatory bar 786, the 4-arm bellcrank lever is returned to normal position by the spring 943, the latch pawl 940 moving down between the two shelves

946 and 947, as shown in Fig. 64. This restoration of the 4-arm bellcrank lever to normal position enables the printing mechanism to print during the succeeding cycle in the manner previously described. Furthermore, during the last half of the instant cycle the plate that was in the selection station during the selection period (approximately the first quarter cycle) of the instant cycle, is shifted into the printing station, so that it is printed from by the operation of the printing head in the succeeding cycle.

Now assuming that the controls are set as before, to select and print only from plates having full tabs positioned to intercept the pins 890, and that the plate in the selection station does not have a tab positioned to intercept the pins 890, the mechanism functions to disable the printing mechanism as follows: Referring to Figs. 69 and 70, the pins 890 are not obstructed by a tab on the printing plate, so that the arm 927 is rocked as a unit with the rock bar 889 and the contact screw 933 engages the face 934 on the arm 935 and rocks the latter into its counterclockwise position, which carries the latch pawl 940 rearwardly above the rear shelf 946. Therefore, when the pawl lever 818 releases the arm 819 on the 4-arm bellcrank lever, the latter is restrained in clockwise position by engagement of the lower end of the latch pawl 940 with the rear shelf 946, as shown in Fig. 69. Retention of the 4-arm bellcrank lever in counterclockwise position disables the printer for the succeeding cycle so that the plate sensed by the selection mechanism in the instant cycle is not printed from.

To prevent the latch pawl 940 from slipping off the rear shelf 946 the latter is provided with a shoulder 946a at the front end and a pin 946b at its rear end.

The operation of the machine with the selection mechanism adjusted into "Print tab" position has been described in connection with a printing plate having a full tab positioned to intercept the pins 890 and with a plate having no tabs positioned to intercept either of the pins 890. Another possible condition of operation is with a plate having a half tab positioned to intercept only one of the pins 890. As previously described, when the machine is adjusted to respond to a full tab, the interception by a half tab of only one of the pins 890 cannot rock the arm 927 relative to the rock bar 889, and the arm 927 occupies the same position as when neither of the pins 890 is intercepted. This condition is illustrated in Figs. 66 and 67 from which it will be observed that the latch pawl 940 is retained in upper position by the rear shelf 946, to maintain the 4-arm bellcrank lever in clockwise position and disable the printer, exactly the same as in Fig. 69.

As previously stated, the machine can be adjusted to print from all plates except those having tabs positioned to intercept the selection pins 890, by moving the handle 952 into its upper "Skip tab" position. This shifts the link 949 rearwardly and rocks the stop segment 944 rearwardly into the position shown in Fig. 68, so that when the arm 927 is restrained from full clockwise rocking movement by engagement of the selection pins 890 against the tab of a printing plate, the latch pawl 940 is positioned above the front shelf 947 as shown in Fig. 68, thereby maintaining the 4-arm bellcrank lever 745 in clockwise position and disabling the printer head. On the other hand, when the plate in the selection station does not have a tab positioned to intercept the selection

pins, the arm 927 is rocked into full clockwise position, carrying the latch pawl 940 into a position between the shelves 946 and 947 and permitting counterclockwise restoring movement of the 4-arm bellcrank lever following its release by the pawl lever 818, thereby enabling the printing mechanism to print.

All operations of the selection mechanism hereinbefore described, involved two selection pins 890, and interception of both pins by a full tab on a printing plate was required to effect a selection. When it is desired to have the mechanism respond to a half tab, the machine is conditioned to respond to interception of only one of the selection pins 890, by sliding the short plate 892 on the front square bar 894 to a point adjacent the left end of the latter bar (Fig. 57) where the plate is clear of the rock bar 889 but is intercepted by the upper end of a stationary arm 953 (fixed to the left frame of the machine) — (see Fig. 20)—each time the rock bar 889 is rocked downwardly, thereby rocking the front square bar 894 relative to the rock bar frame 889a axially the same as though it were stopped by one of the selection pins engaging a tab on a printing plate.

The arm plates 892 and 893 are adapted to be locked in any position of adjustment on their associated bars 894 and 895 by set screws 892a and 893a, respectively.

When the machine is adjusted to respond to full tabs, the two selection pins 890 and the associated arm plates 892 and 893 are positioned close together, as shown in Fig. 56. However, there are other very useful arrangements of the two selection pins and their associated arm plates 892 and 893. Thus, as shown in Fig. 58, the arm plates 892 and 893 may be spaced apart, the long plate 892 being positioned above a selection pin in the twentieth hole (from left to right) of the rock bar 889, and the short plate 893 being positioned above a selection pin in the eighth hole of the rock bar, so that the selection mechanism will respond only to printing plates having two tabs so positioned as to intercept pins in the eighth and twentieth holes of the rock bar.

When it is desired to select only a single class of plates, each having a half tab in a certain position, then only one selection pin 890 is positioned in the rock bar 889, the short plate 892 being positioned as shown in Fig. 57 to be actuated by the stationary arm 953. Likewise, when only one class of plates having full tabs are to be selected, then only two selection pins are employed, one for each of the plates 892 and 893, as shown in Fig. 56. However, it may often be desirable, during a single run of the machine, to select more than one class of printing plates. This may be readily accomplished by positioning the tabs on the printing plates in the different classes closely adjacent each other, and inserting a plurality of selection pins in the rock bar 889 under one or both of the arm plates 892 and 893 so that one of the pins under each arm plate will actuate it in response to a printing plate in any one of the classes of the group.

As many as five different classes of printing plates can be printed from in this way in one run of the machine with the apparatus as shown in Fig. 56, since the width of each of the arm plates 892 and 893 is such as to overlie five pins positioned in adjacent holes in the rock bar. Obviously the arm plates 892 and 893 can be made either narrower or wider than as shown, as

there is no particular reason for making them of a width to cover five pins.

Referring now to Fig. 59, the selection mechanism can be made to function without the use of the arm plates 892 and 893, by shifting them into positions clear of both the rock bar 889 and the stationary arm 953, and clamping a bar 954 directly to the top of the rock bar 889 by means of a pair of thumb-screws 955. The bar 954 overlies all the holes in the rock bar so as to solidly retain pins in any or all of those holes against upward movement with respect to the rock bar. With this arrangement, the rock bar is restrained against movement into full lower position when any one of the pins intercepts a tab on a printing plate, thereby stopping the arm 927 in the same position it is stopped when the rock bar rocks all the way down, and the square bars 894 and 895 are rocked by the arm plates 892 and 893. This incomplete downward movement of the rock bar is possible because of the compression spring 901 (Fig. 64) which is interposed between the rock bar and its driving arm 900. When using the bar 954, any desired number of selection pins may be employed in any desired position along the rock bar.

The selection mechanism as described permits the division of printing plates into 632 classes, each of which can be selected to the exclusion of all the rest. Thus 24 different plates can each have a single half tab in a different position and can be selected by one selection pin in the rock bar. 12 additional plates can be distinguished from each other by the use of a single full tab in a different position on each of the 12 plates, and the use of two selection pins in the rock bar. In addition to the 36 plates mentioned, 280 plates can be identified by providing each plate with two half tabs in various combinative positions, and employing two pins in the rock bar. Thus there can be 23 plates having one half tab in the first position and the second half tab in different ones of the 23 remaining positions; 22 plates having the first half tab in the second position and the second half tab in different ones of the 22 remaining positions, and so on.

The foregoing procedure permits of 316 different classes. This number can be doubled by the simple expedient of filling each plate with tabs except in one or two positions, and adjusting the machine to "Skip tab" position to print in response to the absence of tabs rather than in response to the presence of tabs. Thus 24 additional classes are available by using 11 full tabs and 1 half tab on each plate and so arranging the tabs on different plates as to leave the gap in different positions.

Supposing that the plates have been classified in different classes by the use of full tabs and half tabs in different positions and in different numbers, as outlined, the machine can be adjusted to print from all the plates by moving the selection handle 909 (Fig. 20) into "off" position which disables the selection mechanism. Or it can be adjusted to print from any single class by moving the handle 909 into "Select" position and the handle 952 (Fig. 20) into "Print tab" position, inserting one or two selection pins in the proper position in the rock bar 889, and adjusting the plates 892 and 893.

Obviously the machine can be adjusted to print all plates except those in the class selected as described in the preceding paragraph, by shifting the handle 952 into "Skip tab" position.

Furthermore, the machine can be adjusted to

print from two or more selected classes while skipping all plates in other classes, by inserting additional pins in such positions in the rock bar 889 as to be intercepted by tabs on plates in all the different classes to be selected.

As previously described under the subtitle "Multicating mechanism," if the handle 831 (Fig. 20) is moved into multicating position and the knob 830 (Fig. 20) is turned to display a number higher than "1" in the window 833, the plate-feeding mechanism will be disabled following the delivery of each plate into printing position, for the number of cycles corresponding to the number displayed in the window 833, and if the printing mechanism is enabled, then a corresponding number of envelopes will be printed from the same address plate.

The multicating mechanism can also be employed simultaneously with the selection mechanism so that a plurality of envelopes will be printed from each "Selected" printing plate. However, if no additional mechanism than that heretofore described were provided, the multicating mechanism would be started anew in response to movement of each new plate into printing position, regardless of whether that plate was selected to be printed from or not, and a great deal of time would be wasted while the machine idled cyclically with non-selected plates in the printing position, because non-selected plates, as well as selected plates, would remain in the printing position while the multicating mechanism operated. The only difference in operation with non-selected plates, as compared with selected plates, would be that the non-selected plates would not be printed from because the printer would be disabled by the 4-arm bellcrank lever 745. Such idling cycles of the machine when multicating with non-selected plates in printing position is prevented by the simple expedient of providing a link rod 956 (Fig. 78) which is slidably supported at its lower ends in a guide 957 for vertical reciprocation, and is pivotally connected at its upper end to the fourth arm 958 on the 4-arm bellcrank lever 745 so that the link moves downwardly whenever the bellcrank lever is rocked clockwise into position to disable the printing head. When the link rod 956 is moved into this lower position, as shown in Fig. 78, its lower end is in the path of the stop 837 on the forward end of the multicating ratchet rack 839, and as soon as the ratchet rack is moved out of its normal position during the first printing cycle at the beginning of a multicating operation, the lever 838 is actuated to trip the ratchet rack 839 and restore it to its normal position, thereby immediately enabling the plate-feeding mechanism to feed a new plate into printing position.

Summarizing: The link rod 956 disables the multicating mechanism in response to movement of a non-selected plate into printing position and prevents it from cycling the machine unnecessarily.

Long pin selection structure

The selection mechanism as hereinbefore described involves the use of one or more selection pins 890, all of which are of standard length. It is possible, however, by modifying the mechanism for shifting the arm 927 and by using a long selection pin (Fig. 88), in addition to one or two selection pins of the usual length, to increase the number of classes that can be selected.

It will be recalled, with reference to Figs. 62a and 66a that the shoulders 929 and 930 on the arms 920 and 926 merge into vertical ball-contact-

ing surfaces extending down below the shoulders 929 and 930 for substantial distances so that the arm 927 was always actuated by upward movement of both the arms 920 and 926, irrespective of whether those arms move upward simultaneously or not. Thus referring particularly to Fig. 66a, it will be observed that initial upward movement of the arm 920 forces the ball 931 to the left into the path of the shoulder 929, and maintains it in that position so that if the arm 926 later carries the shoulder 929 upwardly it will engage against the ball 931 and rock the arm 927.

The structure shown in Fig. 88 differs essentially from that shown in Fig. 62a in that the shoulders 929a and 930a (Fig. 88) on the arms 926 and 920, respectively, are very short, so that if only one arm moves up, the shoulder thereon slips past the ball 931, and if the shoulder on the other arm later rises, the ball can move away from it, and the arm 927 is not rocked, even though both of the arms 926 and 920 have been rocked.

Thus referring to the particular operation illustrated in Fig. 88, both arms have been raised but the arm 920 has been raised to a higher level than the arm 926. Furthermore, the arm 920 was raised prior to the raising of arm 926, and its shoulder 930a slipped up past the ball 931 before the arm 926 raised. Therefore, when arm 926 came up, its shoulder 929a simply forced the ball 931 to the right, below the shoulder 930a, and no upward movement has been imparted to the ball 931, and consequently the arm 927 has not been rocked.

However, it will be obvious from observation of Fig. 88 that whenever the arms 920 and 926 rise simultaneously, the shoulders 929a and 930a will simultaneously engage opposite sides of the ball 931 and will carry the ball upwardly, rocking the arm 927 to effect a different selection than if the arm had not been rocked.

During normal operation of the selection mechanism for selecting full tabs on plates, two short pins 890 are employed, cooperating with the short and long arm plates 892 and 893. Obviously, when the two plates 892 and 893 engage the two pins 890 of equal length, and both pins are stopped by a full tab on a plate, then both square bars are rocked simultaneously so that the ball and shoulder mechanism shown in Fig. 88 functions in the normal manner, as previously described in connection with the mechanism of Figs. 62a and 66a. However, if additional means is provided for rocking one of the square bars before it would be rocked by its associated pin 890, then the short shoulders 929a and 930a will function to permit the two square bars to rock without actuating the arm 927, and the plate having the full tab intercepting both the pins 890 will not be selected. Such initial rotation of one of the square bars can be selectively effected by the use of a special, extra long, selection pin positioned to cooperate with a special tab on the printing plate. Thus, as shown in Fig. 88, an additional long pin 890a is provided in one of the apertures 888 in the rock bar 889 and an additional short arm plate 892b is provided on the front square bar 894 and adjusted longitudinally on the bar to overlie the extra long pin 890a. Now suppose that it is desired to subdivide a class of plates having a full tab in the position indicated at A in Fig. 88. This can be done by providing some of the plates in that class with an additional half tab in the position indicated at B in Fig. 88. With the machine in print tab position if it is de-

sired to print from all of the plates in the class having full tabs in the position A, then the long pin 890a is removed from the rock bar and the machine will function to select and print from all of the plates in the class, exactly as previously described.

However, if it is desired to skip the plates in the class which has the additional half tab in the position B, then the long pin 890a is inserted as shown in Fig. 88, and it will function to prevent the two pins intercepting the full tab A from rocking the selection arm 927 in the manner outlined.

Obviously, by providing different ones of the plates in the class having the full tab in position A with additional half tabs in various ones of the 22 variable positions on the plate and properly positioning the extra long pin 890a, the machine can be conditioned to omit any one of the different subdivisions of the class. Furthermore, by providing more than one long pin 890a, more than one of the subclasses can be skipped during any printing run.

It will also be apparent that when employing a half tab and only one of the standard length pins 890, each class can be subdivided into 23 subclasses any one of which can be skipped during a printing run by properly positioning the extra long pin 890a.

The extra long pin can also be employed to subdivide any class of plates employing two half tabs cooperating with two standard length pins 890, into 22 subclasses.

BELL SIGNAL

When operating the machine, it is sometimes desirable to produce a signal in response to movement of certain special printing plates into the selection station, as when the envelope to be printed from such a plate is to receive different treatment from the general run of envelopes. As an example, the envelopes sent to certain addressees may require insertion of special literature not sent to the other addressees. In the present machine, such special plates are equipped with extra thick selection tabs, and a mechanism is provided which responds to such tabs to produce an audible signal.

When a plate having thick tabs moves into the selection station and the selection pins encounter the thick tabs, they restrain the downward movement of the arm plates 892 and 893 and limit the corresponding rotation of the square bars 894 and 895, respectively, to a very small angle.

Secured to the right end of the rear square bar 895 (Figs. 56, 87) is a forwardly extending arm 958 which is juxtaposed to the arm 921 which supports the right end of the front square bar 894. Each of these arms 921 and 958 has a downwardly depending portion which slidably supports a slide 959 or 960. Thus the downwardly depending portions of the arms 921 and 958 may have screws 961 thereon which engage slots 962 in the slides 959 and 960. The upper ends of the slides 959 and 960 are bent over to form finger pieces 963 and 964, respectively.

When the machine is in full cycle or normal position, the slides 959 and 960 extend parallel to each other and substantially vertical, and when they are in lowermost position, as shown in Fig. 21, their rear edges are juxtaposed to a crank 965 extending from an upper arm 966 of a bell-crank lever 967 fulcrumed on a stationary supporting plate 968 which is secured to the left side frame member of the addressor. A second, for-

wardly extending arm 969 on the bellcrank lever 967 is pivotally connected to the upper end of a link 970, which link has a guide slot therein engaged by a guide screw 971 on the frame of the machine for guiding the link for substantially vertical movement. With the machine in normal position, as shown in Fig. 21, the bellcrank lever 967 is urged into extreme clockwise position by a tension spring 972, this position being determined by engagement of a pin 973 on the lower end of link 970 against the upper edge of a reciprocating bar 974 (Fig. 72). This bar 974 has a longitudinal slot 975 intermediate the ends, which slot is engaged by a stationary supporting screw 976, and the bar is pivotally connected at its rear end 977 to the upper end of the arm 592 which is mounted on the right end of the rock shaft 538, so that the reciprocating bar 974 is reciprocated by the rock shaft 538 during each cycle of operation of the machine.

Pivotally supported on the forward portion of the reciprocating bar 974 is a pawl 978 which pawl is rockable between a clockwise position in which a nose 979 thereon is positioned below the upper edge of the reciprocating bar (Fig. 20) and a counterclockwise position as shown in Fig. 72, in which the nose of the pawl extends above the upper edge of the reciprocating bar (Fig. 72). The pawl is frictionally engaged against the reciprocating bar by a spring washer 980 under the head of the pivot screw which fulcrums the pawl on the reciprocating bar. This affords sufficient friction between the pawl and the reciprocating bar to retain the pawl into which ever position it has been moved. If the pawl is in counterclockwise position during rearward reciprocation of the reciprocating bar, the nose of the pawl engages against a shoulder 981 on the lower end of the lever 982 fulcrumed at 983 on the addressor frame and having an upper end adapted to strike and ring a bell 984 when the lever is swung clockwise. The lever is urged clockwise by a spring 985 and when the lever is rocked counterclockwise by the pawls 978 and released, the spring drives the upper end of the lever against the bell to ring it.

When the machine is in full cycle position, the pin 973 rests on the upper edge of the reciprocating bar 974 at a point slightly rearward of the fulcrum of the pawl 978, leaving the pawl in inactive position, with its nose above the upper edge of the reciprocating bar. The pin will engage and cam the front end of the pawl downward, moving its nose up into position to engage the shoulder 981, and first rock the lever 982 counterclockwise and then release it, to ring the bell. On the other hand, if, during the rearward reciprocation of the reciprocating bar the pin 973 is lifted clear of the reciprocating bar, the pawl will remain in inactive position and the bell will not be rung.

Whether or not the pin 973 remains in lower position against the reciprocating bar, or is elevated clear of the bar, during the rearward reciprocation of the latter, depends upon whether or not the selection pins encounter a thick tab on a printing plate in the selection station. Thus if the selection pins do encounter a thick tab, the square bars 894 and 895 and the slides 959 and 960 are restrained against counterclockwise rotation (with reference to Fig. 72), and the bellcrank lever 967 remains in counterclockwise position, thereby leaving the link 970 and its pin 973 in lower position under the influence of the tension spring 972, so that the pin 973 cams the

pawl counterclockwise into bell-ringing position. On the other hand, if the selection pins encounter no tabs (Fig. 74), or a thin tab (Fig. 75), the square bars 894 and 895 and the slides 959 and 960 rock counterclockwise, to rock the bellcrank lever 967 clockwise and lift the link 970 upwardly, carrying the pin 973 clear of the pawl 978 so that the latter remains in inactive position and does not ring the bell.

It will be noted from the description so far that counterclockwise rocking movement of either one of the square bars 894 and 895 and its associated slide 959 or 960 will disable the bell-ringing mechanism. Furthermore, when the machine is adjusted to select half tabs, and the short arm plate 892 on the front square bar 894 is adjusted into position above the stationary arm 953, then, during each and every cycle of operation, the slide 959 associated with the front square bar, would rock far enough to disable the bell-ringing mechanism, thereby preventing the long arm plate 893 from controlling the mechanism to ring the bell in response to a thick half tab on a printing plate. It is to permit the control of the bell-ringing mechanism by either the long arm plate alone, or the short arm plate alone, that the slides 959 and 960 are provided. Thus by sliding either of these slides upwardly its lower end is carried above the crankpin 965, leaving the latter under the sole control of the other slide. By sliding both of the slides 959 and 960 into their uppermost positions, the bell-ringing mechanism is completely disabled.

As another example of the use of the slides 959 and 960, by sliding one of the slides upward into inoperative position the bell-ringing mechanism can be made to respond to a thick half tab under conditions such that if both slides were in lower active position the bell would be rung only in response to thick full tabs. This condition is illustrated in Fig. 73.

It will be apparent from the foregoing description that the bell-ringing mechanism is associated with the selection mechanism to the extent that the bell-ringing mechanism cannot be selectively actuated unless the rock bar 889 is rocked down to carry the selection pins against tabs on plates in the selection mechanism. However, it is usually desired to employ the bell-ringing mechanism during manual operation, and without placing the printing mechanism under the control of the selection mechanism. This may be done by shifting the selection handle 909 into its uppermost, or "Bell," position (Fig. 71), which disables the 4-arm bellcrank lever 745 and the 3-arm bellcrank lever 801. This movement of the handle 909 into the extreme upper or "Bell" position rocks the link 822 (Fig. 71) into an extreme forward position, in which the bellcrank lever 814 is rocked into its clockwise position by a link 985. Thus the link 985 is pivotally connected at its lower end to the link 822, and is connected at its other end to the bellcrank lever 814 by a pin and slot connection, the latter being provided to permit free movement of the bellcrank lever 814 when the handle 909 is in "Select" or "Off" position.

As has been previously explained, the bellcrank lever 814 has a rearwardly extending arm 817 which, when the bellcrank lever is in extreme clockwise position, as shown in Fig. 71, engages the tails of the pawl levers 789 and 818, and holds them clear of the arms 893 and 818 on the 3-arm and 4-arm bellcrank levers, respectively. Therefore, when the handle 909 is in "Bell" position,

the 4-arm bellcrank lever cannot function to disable the printer in response to movement of the rock bar 889, and the 3-arm bellcrank lever cannot function to disable the printer in response to absence of a printing plate in the selection station. The printer is therefore free to operate under manual control.

However, it is to be noted that the movement, by the link 935, of the bellcrank lever 814 does not shift the bellcrank lever 815, which controls the pawl lever 908, which cooperates with the arm 900 to rock the rock bar 889, and the latter is therefore rocked down during each cycle to control the bell in response to thick tabs, as already described in detail.

As previously explained, the bell is rung in response to a limitation of the rocking movement of one or both of the square bars 894, and 895, and this limitation of the rocking movement may be produced by engagement of a pin of normal length with a thick tab. Obviously, the rocking movement of the square bars could be equally well limited by employing extra long selection pins in conjunction with normal, thin, tabs on the printing plates. Therefore, if desired, during manual operation the machine can be adjusted to ring the bell in response to plates of a certain class (such plates having a thin tab or tabs thereon), by inserting extra long pins in the machine in position to cooperate with the tabs of the selected class of plates.

SUMMARY

It will be apparent from the foregoing description that the machine as described can be operated as follows:

(1) To print different addresses on each one of a series of envelopes, printing successively once from every plate in the magazine.

(2) To print any desired number of successive envelopes with the same address under manual control (repeat printing).

(3) To print from 2 to 15 envelopes from each address plate in the magazine, automatically.

(4) To print envelopes from a selected group of plates in the magazine and pass unselected plates through the machine without printing therefrom.

(5) To print any desired number of envelopes from each plate of a selected class of plates, under manual control.

(6) To print from 2 to 15 envelopes from each address plate of a selected class automatically, while rapidly passing plates of non-selected classes through the machine without printing from them.

(7) When operating the machine for selective printing, as outlined in paragraphs 4, 5 and 6, the machine can be adjusted to print and skip plates as follows:

(a) Print from all plates having selection tabs thereon, and skip all plates having no selection tabs;

(b) Print from all plates having no selection tabs and skip all plates having selection tabs;

(c) Print from any single class of plates having a tab or tabs in certain specified position, while skipping all other plates;

(d) Skip any single class of plates having a tab or tabs in certain specified positions, while printing all other plates;

(e) Print a certain subclass (or subclasses) of a selected class, and skip all other subclasses of that particular class, and all plates of other classes.

(8) To feed plates through the machine, with

or without printing envelopes therefrom, until a desired plate is reached and announced by bell signal.

(9) To skip plates until the bell signal is actuated in response to a desired plate, and then print from remaining plates, or vice versa.

(10) Under manual control to print from plates wanted, and skip plates not wanted.

(11) To print the same slogan and/or the same date on every envelope, with or without addressing the envelope.

(12) To print consecutive numbers on every envelope passing through the machine, with or without printing addresses.

(13) To print the same number on every envelope of a series printed with the same address, whether the same address is printed by "Repeat" operation or by "Multicate" operation.

(14) To print duplicate numbers on all envelopes printed with the same address in the "Multicate" operation, while changing the number progressively with each new plate printed from.

(15) To print addresses at different locations on the envelopes.

(16) To print slogans and/or numbers at different locations on the envelopes.

(17) To separate the addressor from the power-plant and employ the latter with a different attachment, such as a postage printing machine, a letter-opener, etc.

(18) To start addressing envelopes in response to loading the magazine from a galley and placement of the galley in plate-receiving position, and stop automatically in response to discharge of the last plate into the galley.

Throughout the description of operation of the machine, printing operations have been described with reference to address plates and envelopes. Obviously, however, the plates may have other printed matter thereon than addresses, and other objects can be printed from than envelopes. As examples only, the different plates may bear the necessary information for making up payrolls, pay checks, listing such information as patent marking, operational instructions for different machines, etc. Obviously, objects other than envelopes that may be advantageously printed in a machine of this type include cards, packages, plain paper forms, magazines, newspapers, and, in fact, almost any imaginable type of articles to be printed upon.

It is to be expressly understood that for the purpose of explaining the invention a specific embodiment thereof has been disclosed and described in detail; many departures from the particular construction shown can be made without departing from the invention, which is to be limited only to the extent set forth in the appended claims.

We claim:

1. In a printing machine, printing means located at a printing station, means for consecutively feeding matter to be printed thereto, and control means rendered active by each piece of matter arriving at the printing station for rendering the printing means active to print an impression thereon, in which the matter-engaging portion of said control means is adjustable along the path of travel of the matter for predetermining the longitudinal position of the printing of the impression thereon.

2. In a printing machine, printing means, printing devices, normally inactive means for consecutively feeding printing devices into print-

ing position, normally active means for consecutively feeding matter to be printed into printing position, means rendered operable by movement of each piece of matter into printing position for rendering the printing and device-feeding means active and the matter-feeding means inactive, and means operable upon the completion of the printing operation for rendering the printing and devices-feeding means inactive and the matter-feeding means active.

3. In a printing machine, a driving mechanism, printing means, printing devices, means for consecutively feeding the printing devices to the printing means, means for consecutively feeding matter to be printed to the printing means, normally inactive clutch means connecting the printing and devices-feeding means with the driving mechanism, a normally active clutch means operatively connecting the matter-feeding means to the driving mechanism, and means operable by movement of each piece of matter into printing position for rendering the printing and devices-feeding means clutch active and the matter-feeding means clutch inactive.

4. In a printing machine, printing devices, a magazine for receiving a supply of printing devices, printing means, normally inactive means for consecutively withdrawing printing devices from the magazine and feeding them into printing position, normally active means for consecutively feeding matter to be printed into printing position, and trip means positioned in the path of said matter for controlling operation of said printing, devices-feeding and said matter-feeding means, said means being rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding means active and the matter feeding means inactive.

5. In a printing machine, printing means, printing devices, means for consecutively feeding the printing devices to the printing means, a driving mechanism for operating the feeding and printing means in timed relation, means for interrupting the operation of the printing means, and means actuated by each printing device while being fed into printing position for disabling said interrupting means.

6. In a printing machine, printing means arranged in printing position in the machine, printing devices, normally inactive means for consecutively feeding the printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, trip means rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding means active and the matter-feeding means inactive, and means for maintaining the devices-feeding means active and the matter-feeding means inactive until a printing device is moved into printing position, said trip means, being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position.

7. In a printing machine, printing means arranged at a printing position in the machine, printing devices, normally inactive means for consecutively feeding printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, trip means rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding

means active and the matter feeding means inactive, said trip means being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position, means for maintaining the devices-feeding means active and the matter feeding means inactive until a printing device is moved into printing position, and lock-out means operated by each printing device as it reaches printing position for interrupting the operation of the printing means until a printing device is moved into printing position.

8. In a printing machine, printing means arranged in printing position in the machine, printing devices, normally inactive means for consecutively feeding the printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, trip means rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding means active and the matter-feeding means inactive, said trip means being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position, means for maintaining the devices-feeding means active and the matter-feeding means inactive until a printing device is moved into printing position, and means operable upon the completion of the printing operation for rendering the printing and devices-feeding means inactive and the matter-feeding means active.

9. In a printing machine, printing means, printing devices, normally inactive means for consecutively feeding the printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, trip means rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding means active and the matter-feeding means inactive, and means for interrupting the operation of the printing means whenever the devices-feeding means fails to feed one of the printing devices into printing position, and for maintaining the devices-feeding means active and the matter-feeding means inactive until a printing device is fed into printing position, said trip means being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position.

10. In a printing machine, printing means, printing devices, normally inactive means for consecutively feeding the printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, trip means rendered operable by each piece of matter moving into printing position for rendering the printing and devices-feeding means active and the matter-feeding means inactive, said trip means being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position, selector means for controlling the operation of the printing means whereby impressions will be taken only from determined ones of the printing devices, and means cooperating with the selector means for interrupting the operation of the printing means whenever the devices-feeding means fails to feed one of the printing devices into printing position, and for maintaining the devices-feeding means active and the matter-

feeding means inactive until a printing device is fed into printing position.

11. In a printing machine, printing means, printing devices having selection elements selectively positionable thereon, means for consecutively feeding printing devices into printing position, and selector means cooperating with and responsive to the positions of the selection elements on said printing devices for controlling the operation of the printing means to determine whether or not each device shall be printed from, said selector means including a first member movable to alter the operation of said printing means, a second member, a third member, means responsive only to simultaneous movement of both the second and third members for moving said first member, and separate selector means respectively associated with said second and third members and independently movable in response to differently located selection elements on a device movable toward printing position, whereby the operation of said printing means is altered only in response to a printing device having selection elements in both of two predetermined positions, and selection means responsive to a selection element in a third predetermined position on a printing device for moving one of said second and third members prior to its movement by the said selector means associated therewith, whereby simultaneous movement of said members is prevented.

12. In a printing machine, printing means, printing devices having selection elements selectively positionable thereon, means for consecutively feeding printing devices into printing position, selector means cooperating with and responsive to the positions of the selection elements on said printing devices for controlling the operation of the printing means to determine whether or not each device shall be printed from, said selector means including a first member movable to alter the operation of said printing means, a second member, a third member movable independently of said second member, means responsive to movement of both the second and third members for moving said first member, and separate selector means respectively associated with said second and third members and independently movable in response to differently located selection elements on a single device moving toward printing position, whereby the operation of said printing means is altered only in response to a printing device having selection elements in both of two predetermined positions, and unitary control means connected to said first mentioned selector means for revers-

ing the operation of said selector means, whereby said printing means operates only in response to printing devices lacking selection elements in both of two predetermined positions.

13. In a printing machine, printing means, printing devices, normally inactive means for consecutively feeding the printing devices into printing position, normally active means for consecutively feeding matter to be printed into printing position, means rendered operable by each piece of matter moving into printing position for rendering the printing means and devices-feeding means active and the matter-feeding means inactive, selector means for controlling the operation of the printing means whereby impressions will be taken only from predetermined printing devices, means positioned in the feeding path of said printing devices adapted to be actuated by said printing devices, said last mentioned means being actuated by each printing device as it enters the printing position, and means operatively connecting said last mentioned means to said printing means, the means positioned in the path of the printing devices being adapted to interrupt the operation of the printing means whenever the devices-feeding means fails to feed one of the printing devices into printing position.

14. In a printing machine, printing means arranged in printing position in the machine, a plurality of printing devices, normally inactive means for feeding the printing devices one by one into printing position, normally active means for consecutively feeding matter to be printed into printing position, a trip engaged by each piece of feeding matter as it moves into printing position, means operatively connected to said trip for rendering the printing and devices-feeding means active and the matter-feeding means inactive when said trip is tripped by a piece of matter, said trip and the means associated therewith being normally conditioned for cyclical operation, said operation being suspended after tripping has taken place until a printing device reaches printing position, means for maintaining the devices-feeding means active and the matter-feeding means inactive until a printing device is moved into printing position, and means operable upon the completion of the printing operation for rendering the printing and devices-feeding means inactive and the matter-feeding means active.

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