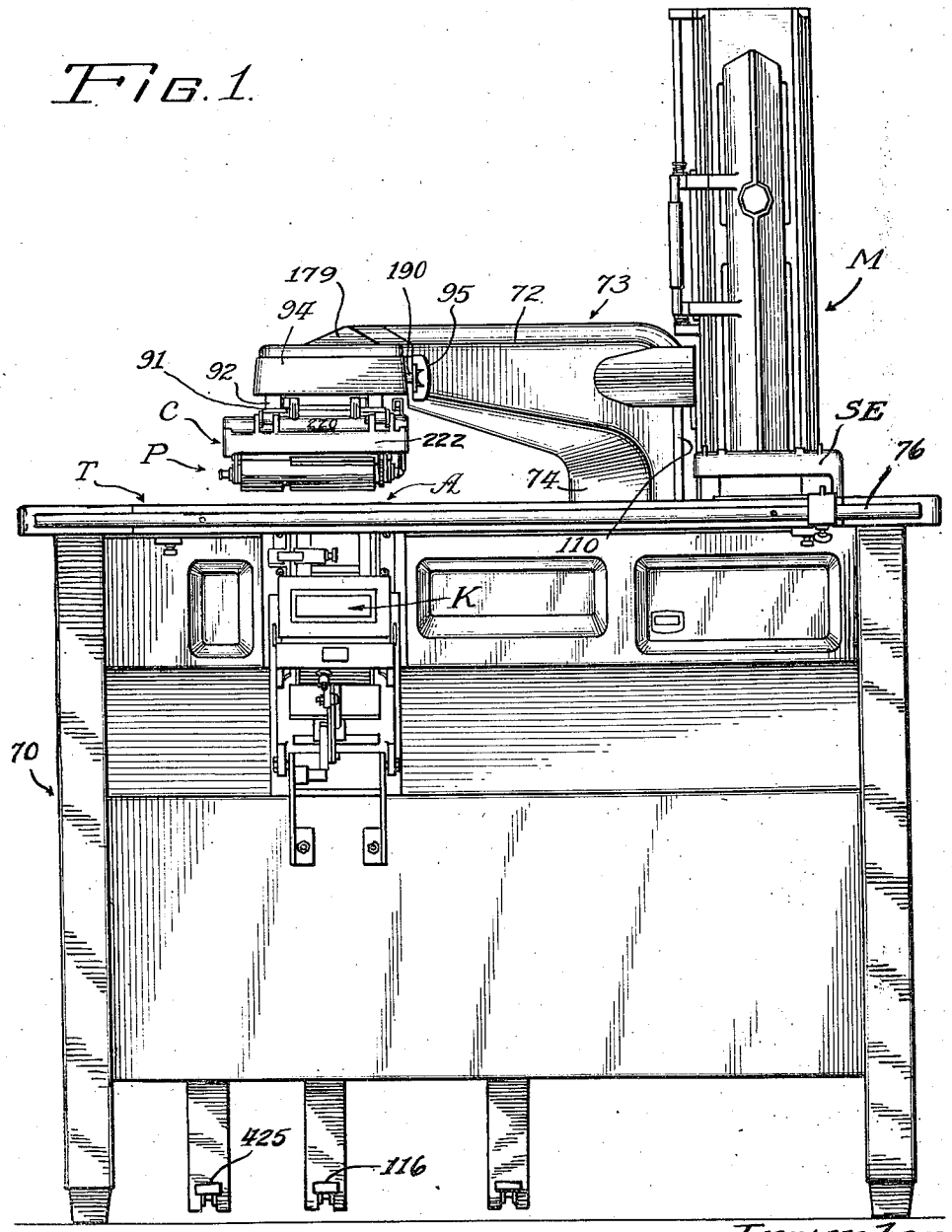
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Fig. 1.



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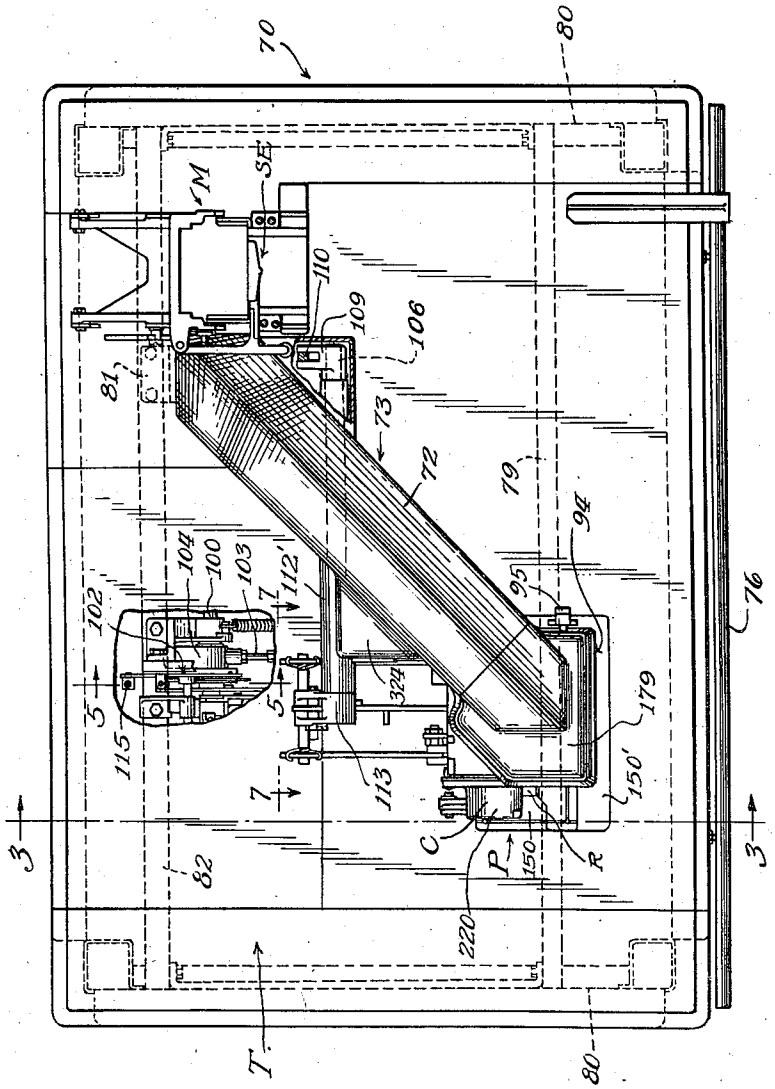


FIG. 2.

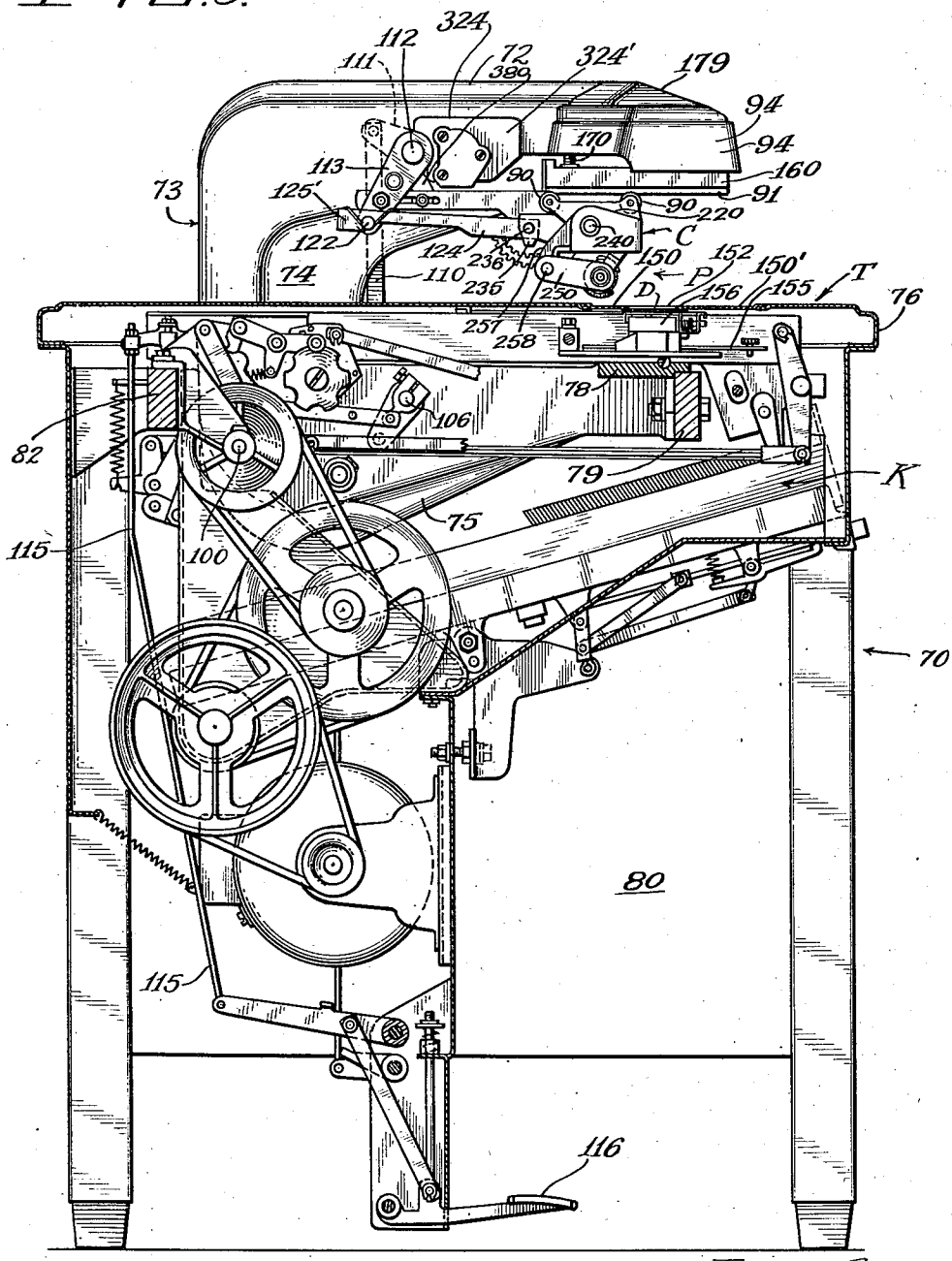
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FIG. 3.



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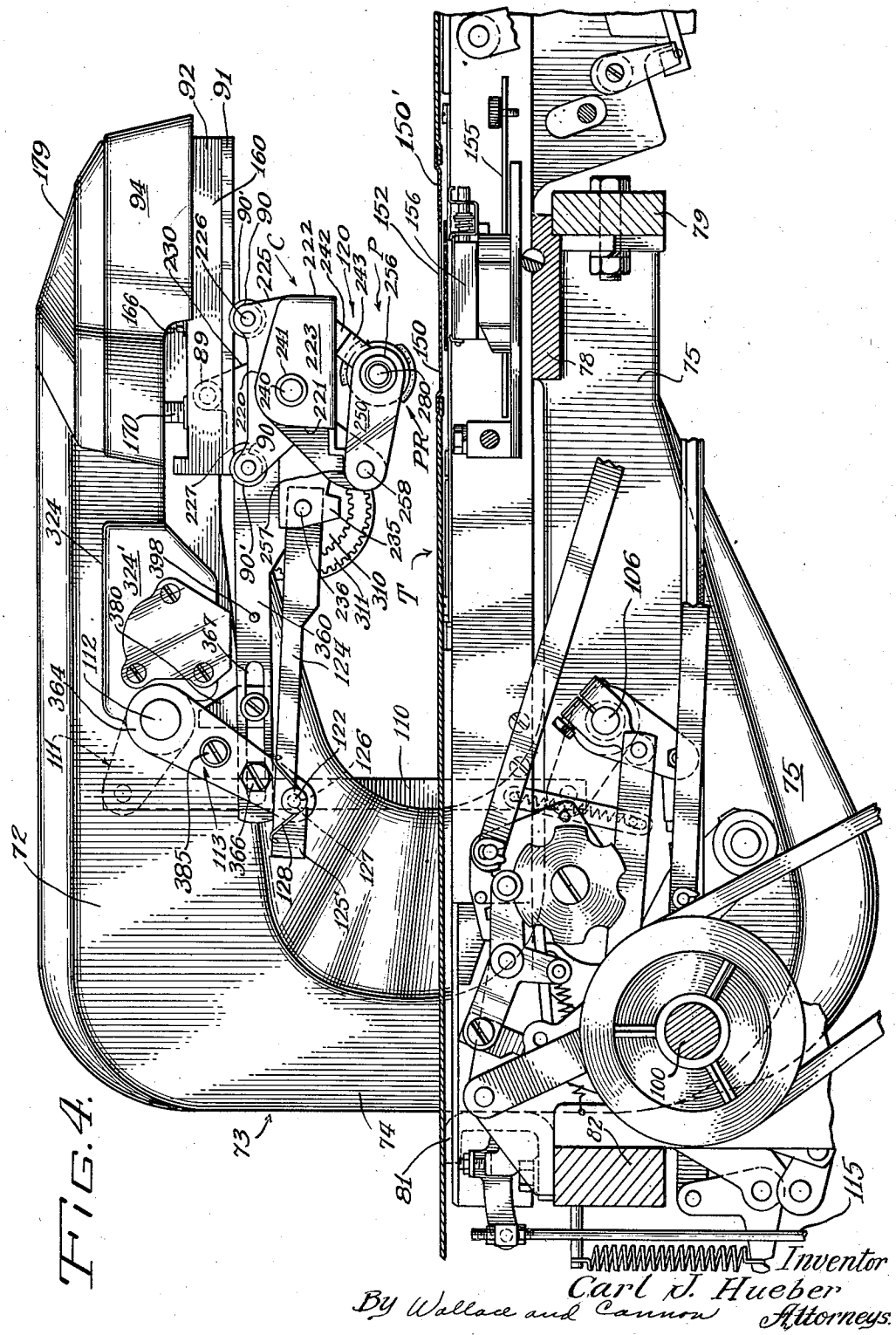


FIG. 4.

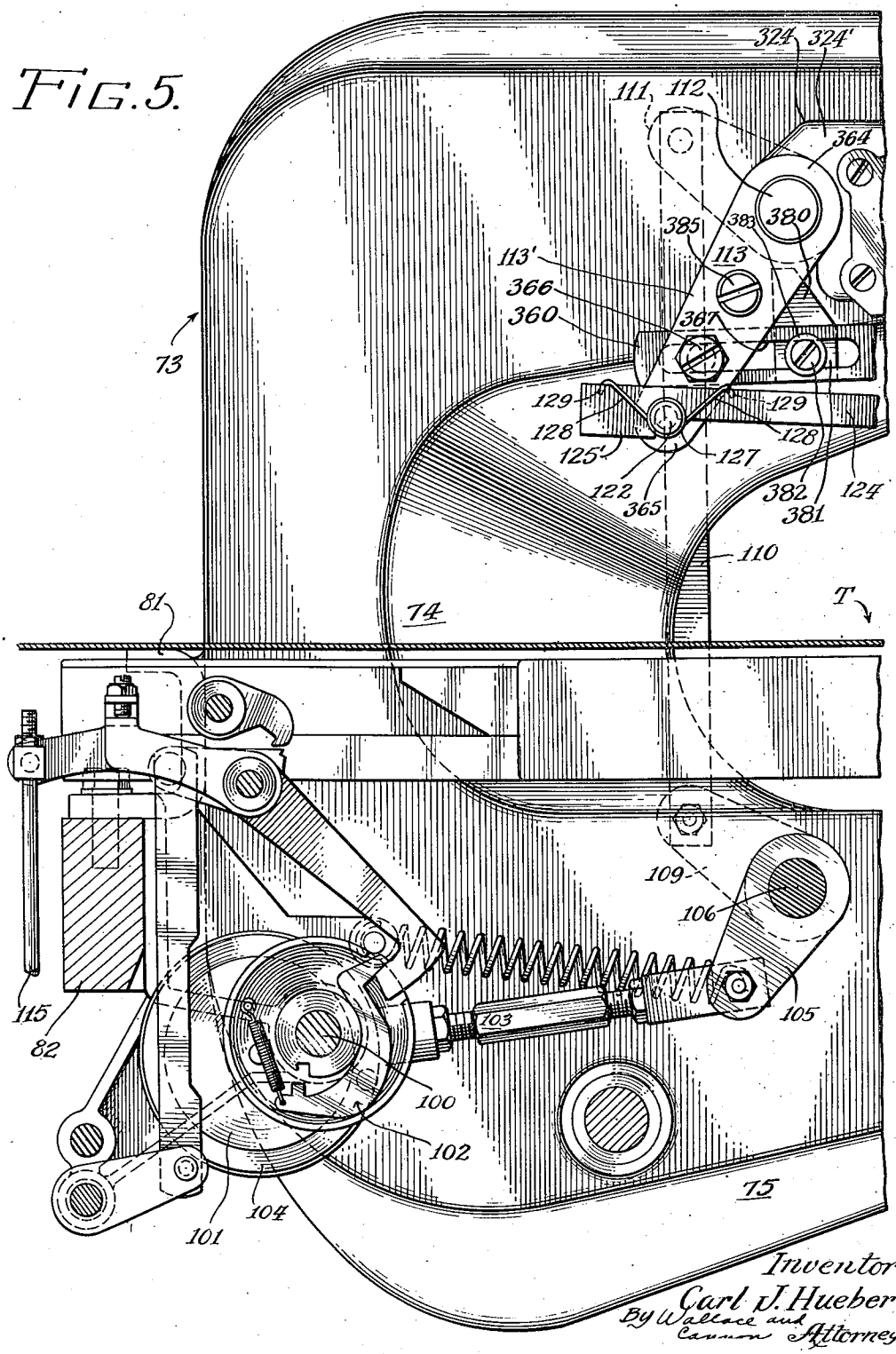
Inventor
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FIG. 5.



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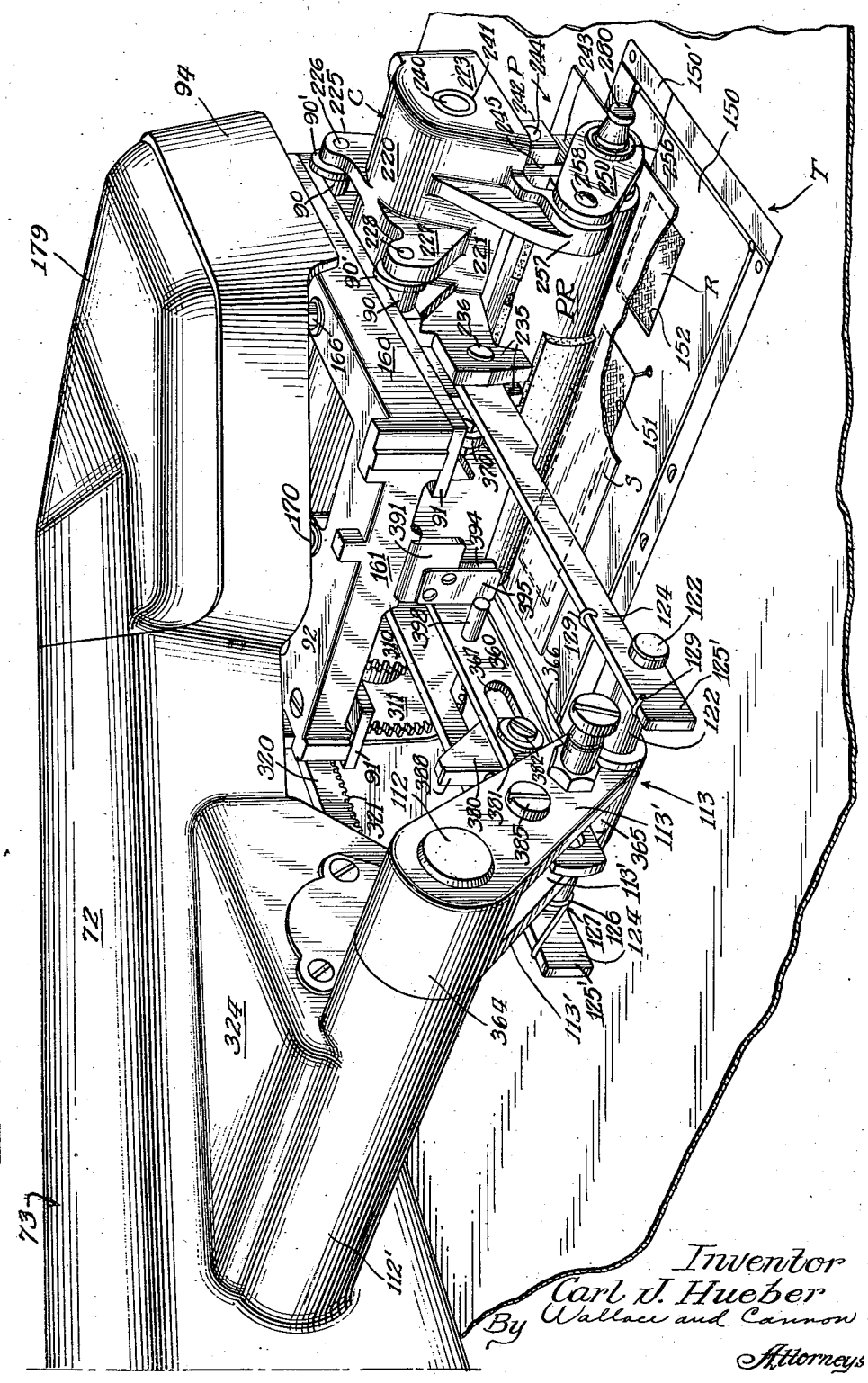


Fig. 6.

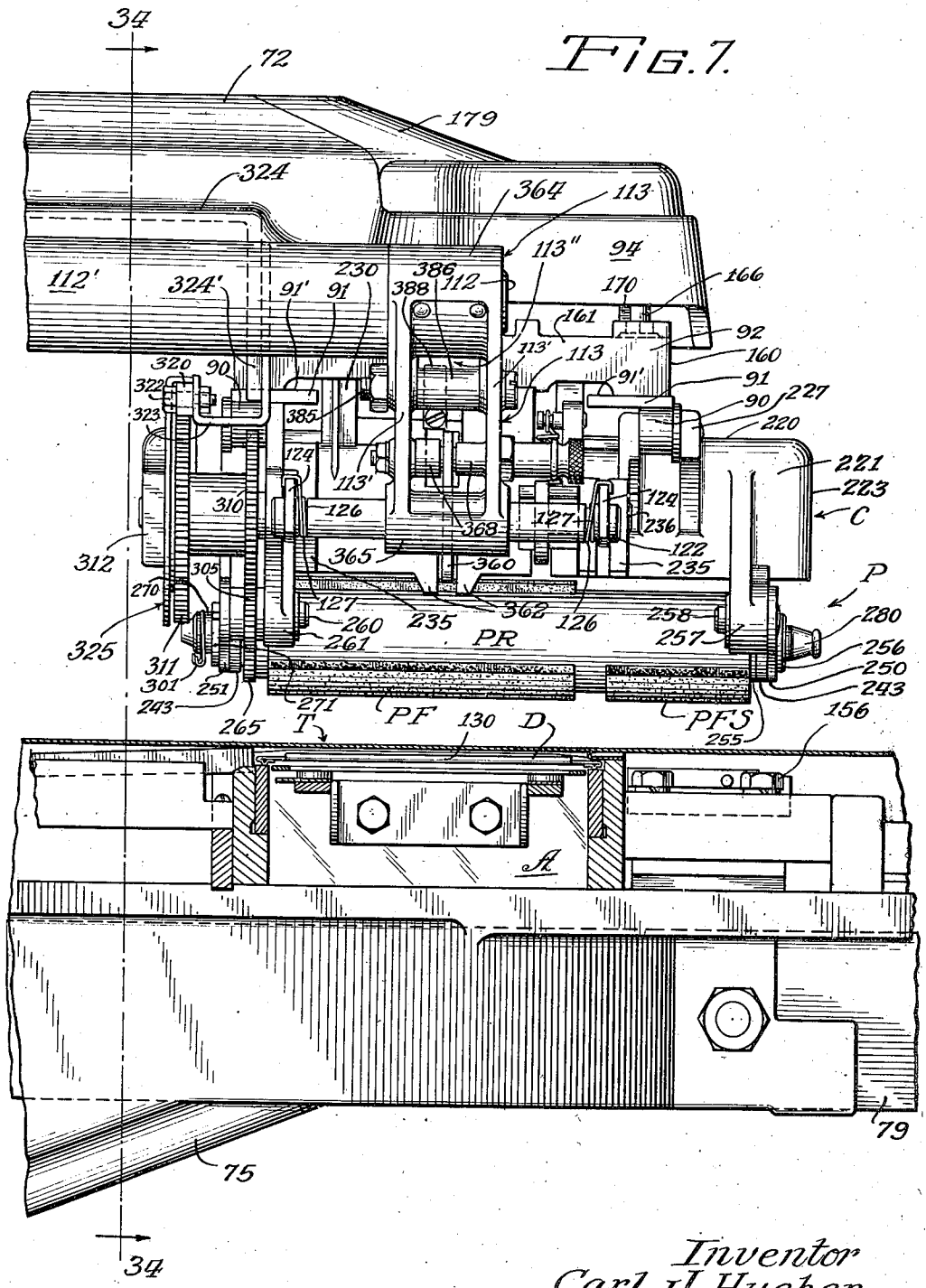
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Fig. 7.



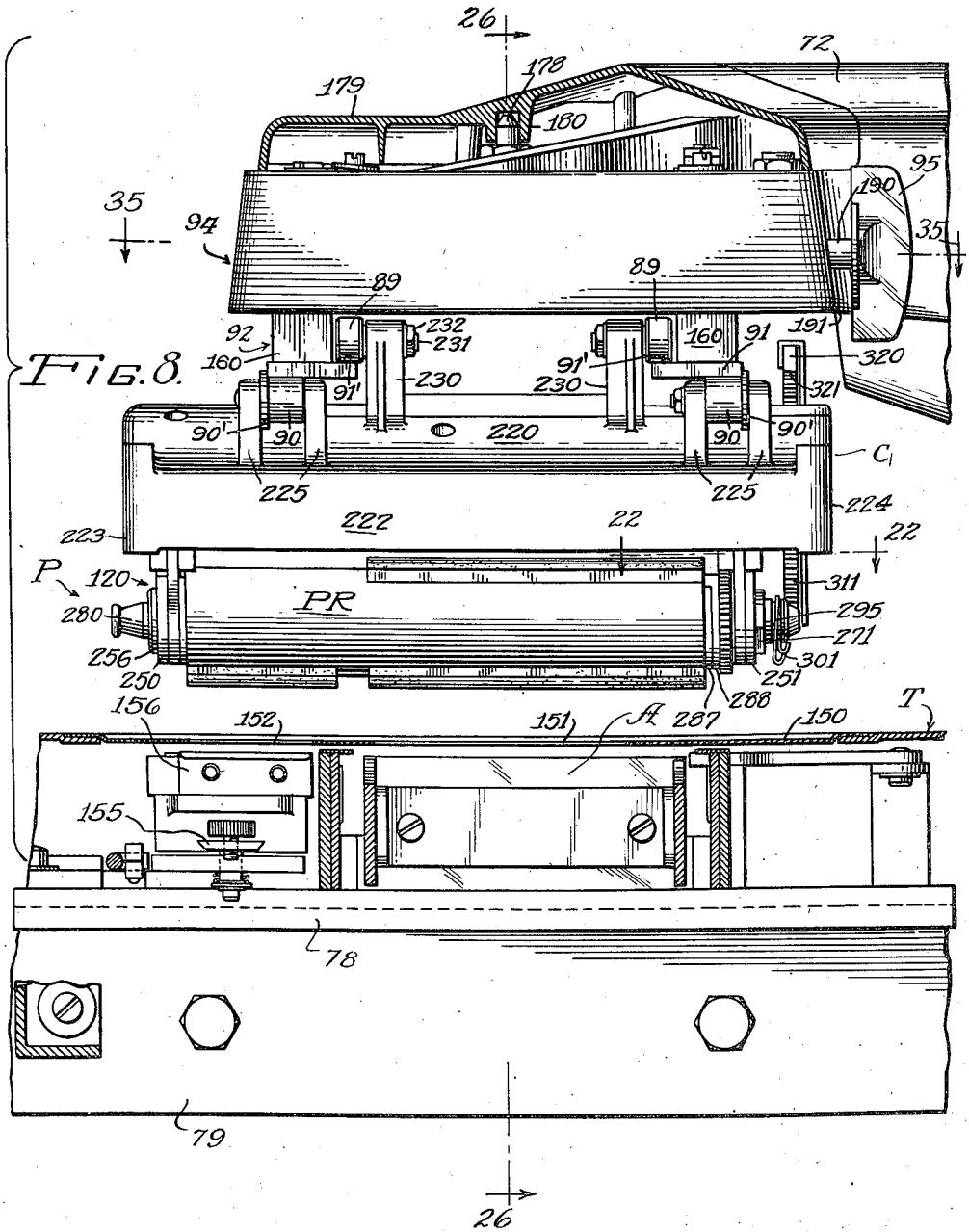
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FIG. 8.



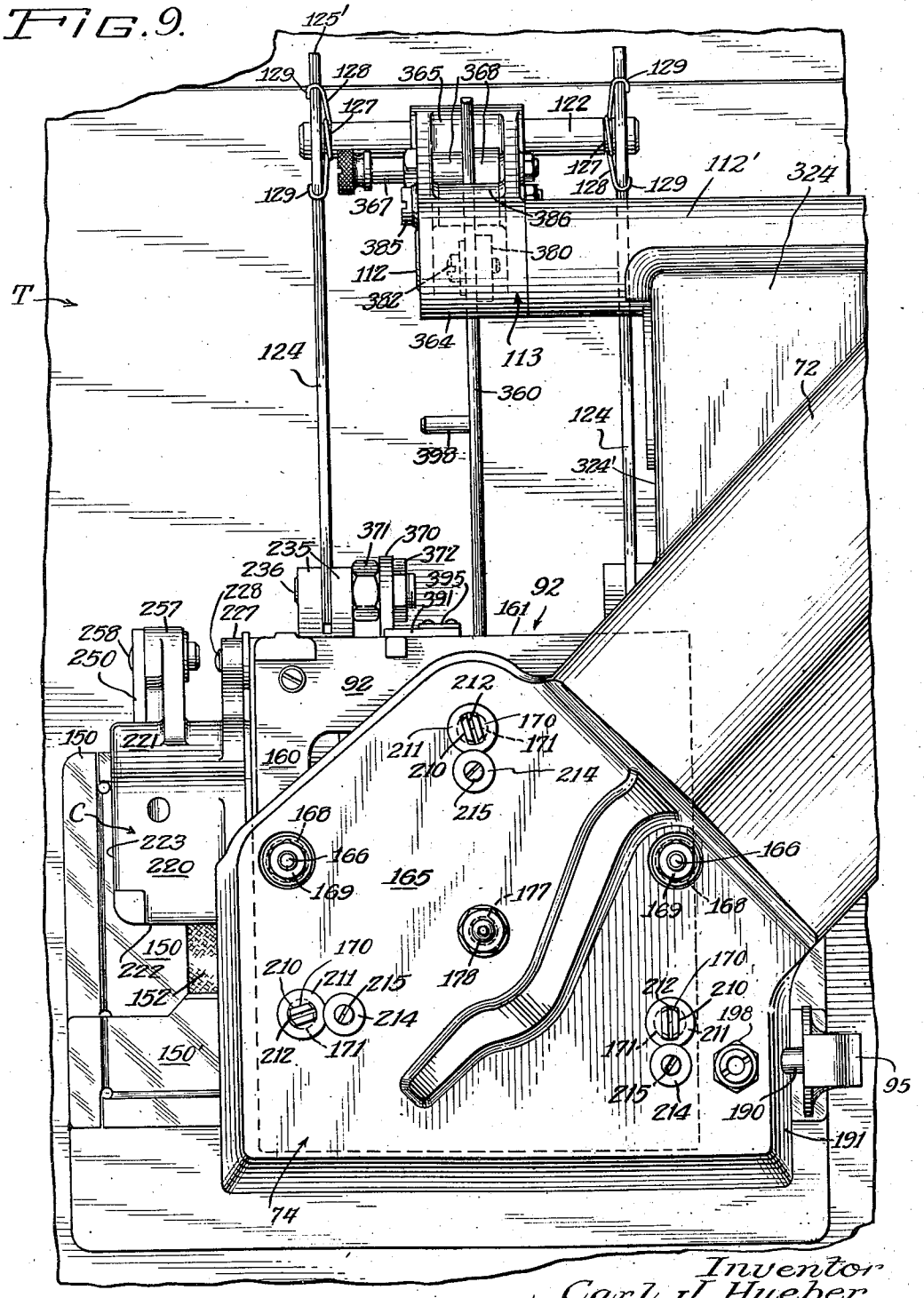
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FIG. 9.



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Fig. 10.

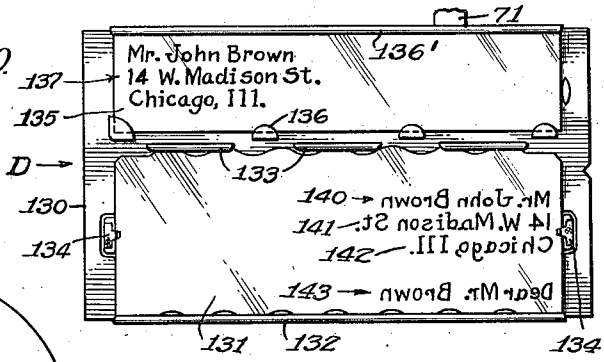


Fig. 11.

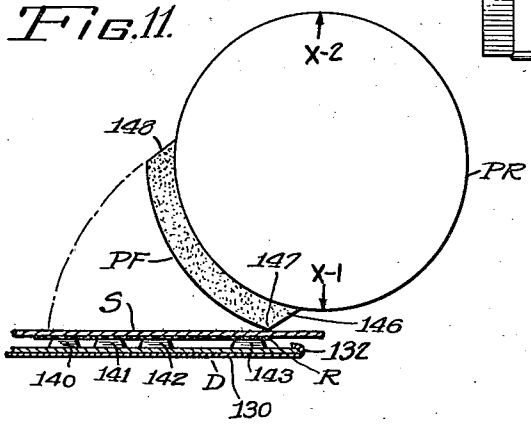


Fig. 12.

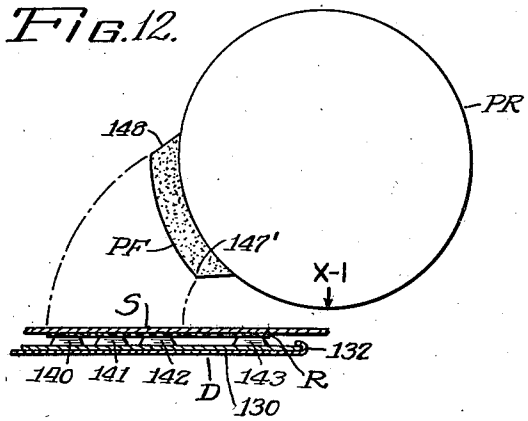


Fig. 13.

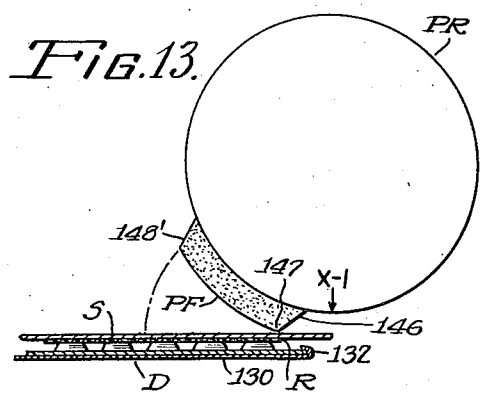


Fig. 14.

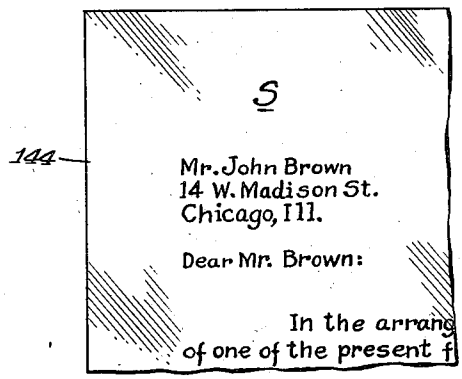
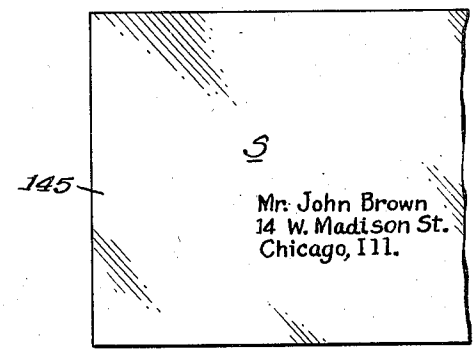


Fig. 15.



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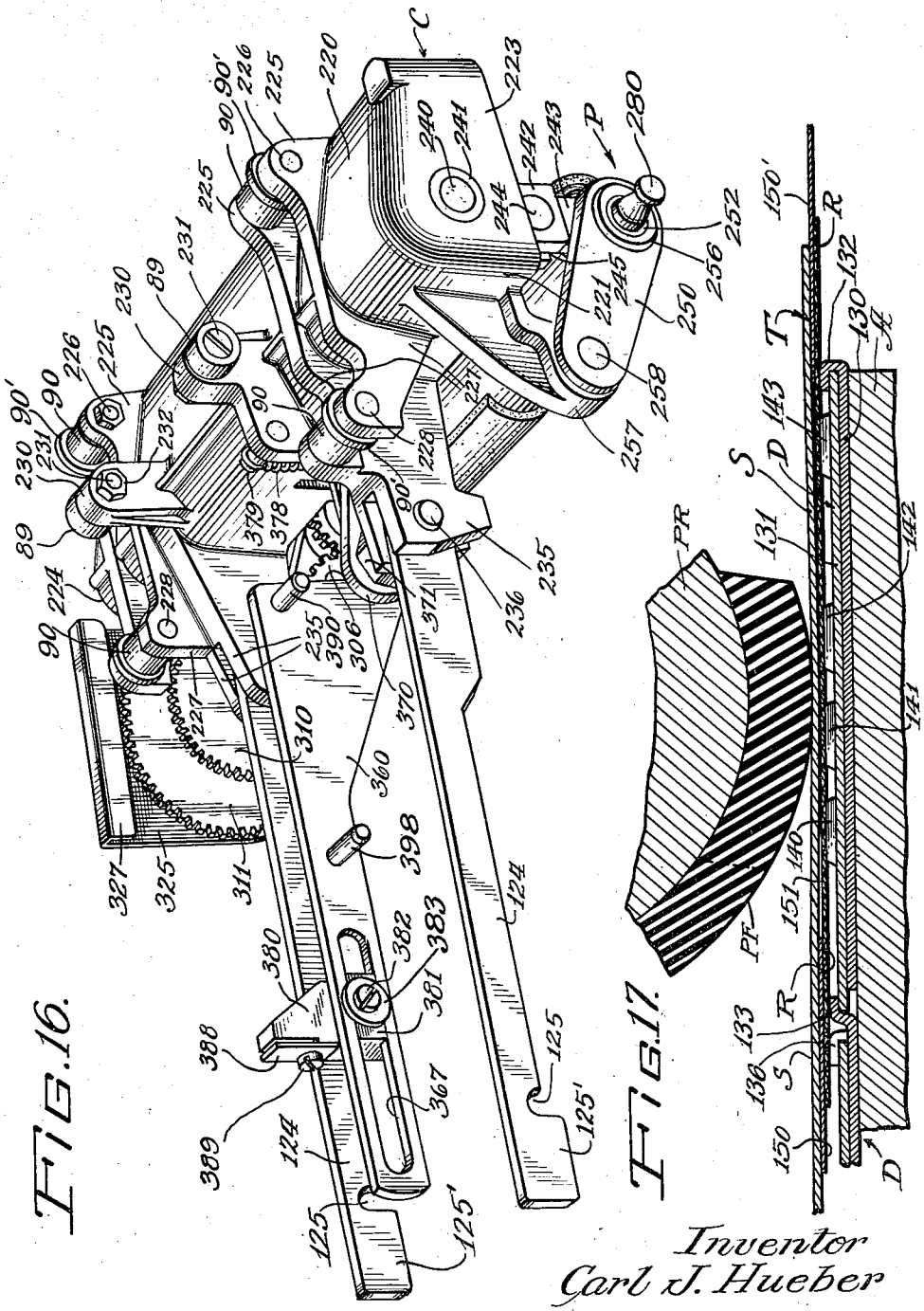


FIG. 16.

FIG. 17.

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Fig. 18.

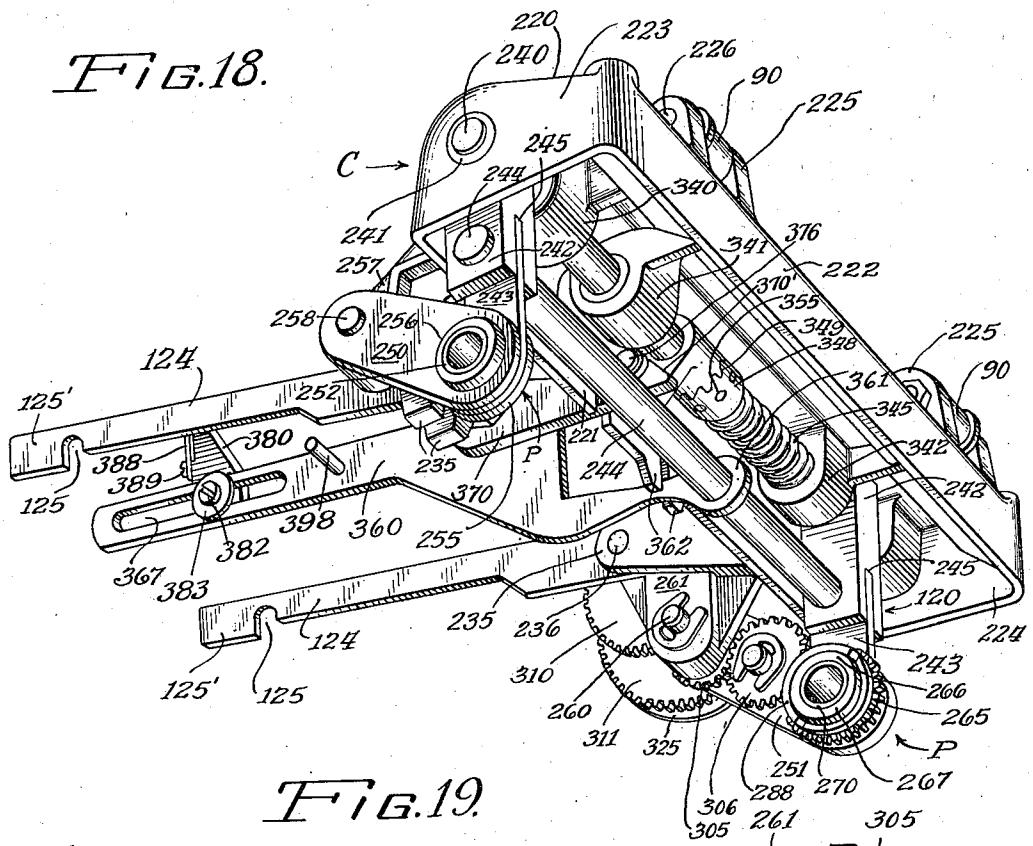
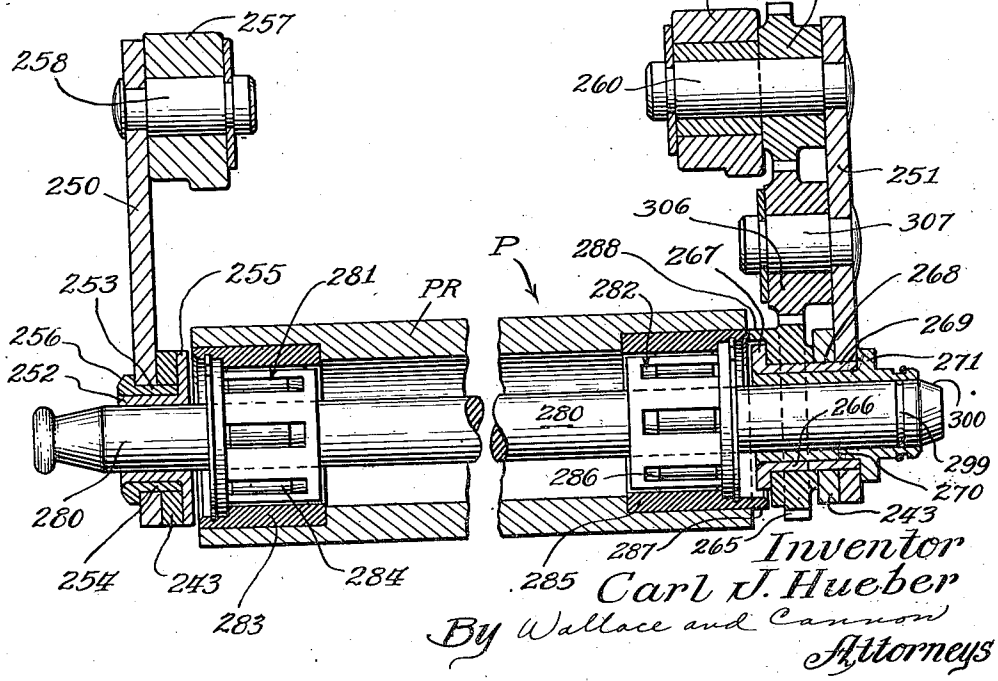


Fig. 19.



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FIG. 20.

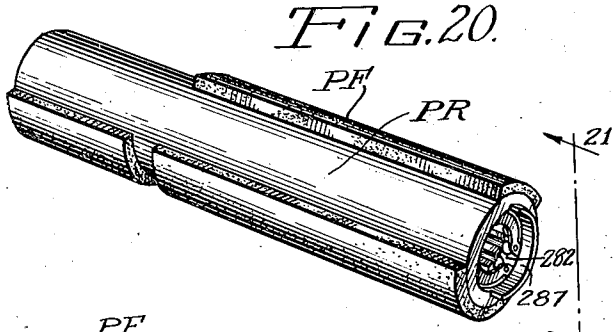


FIG. 21.

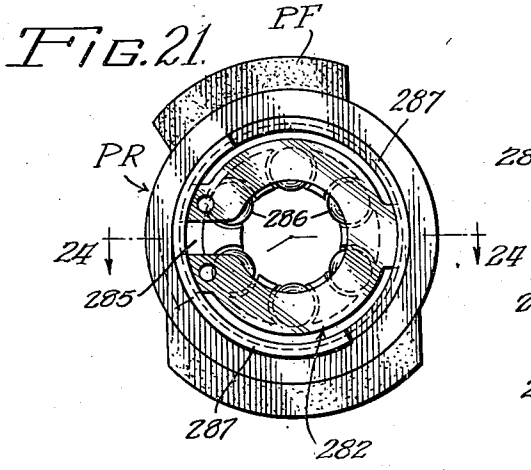


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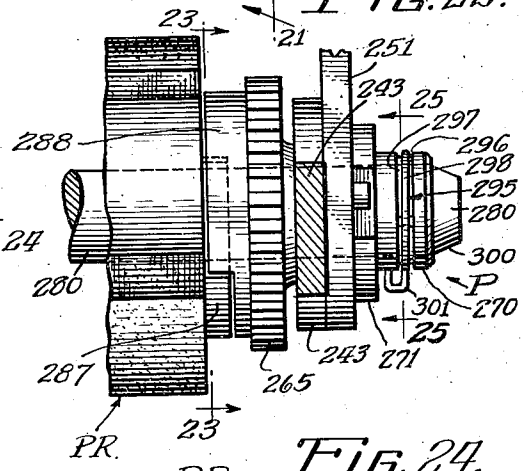


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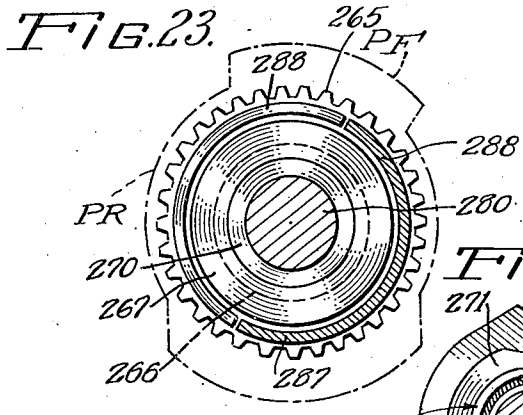


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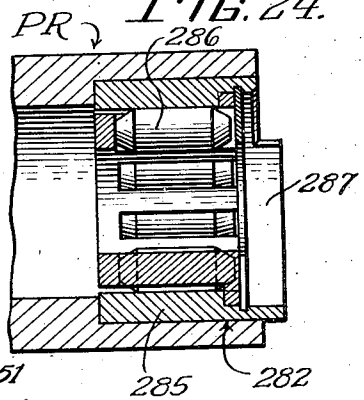
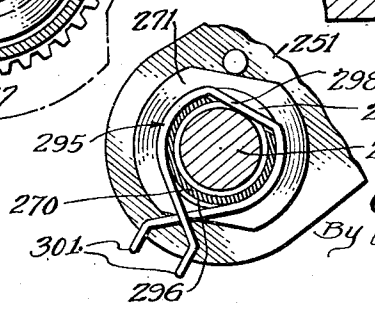


FIG. 25.



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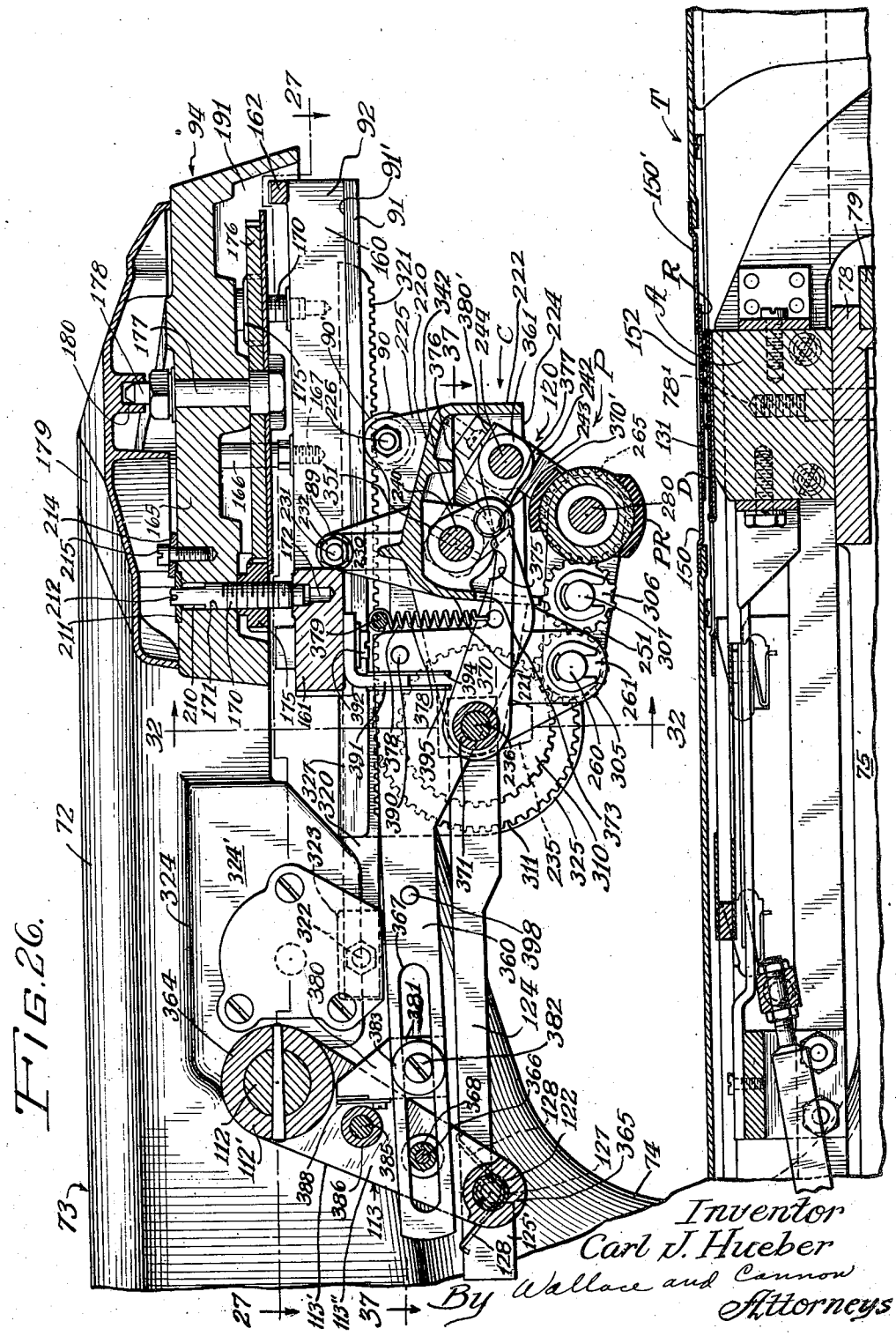


FIG. 26.

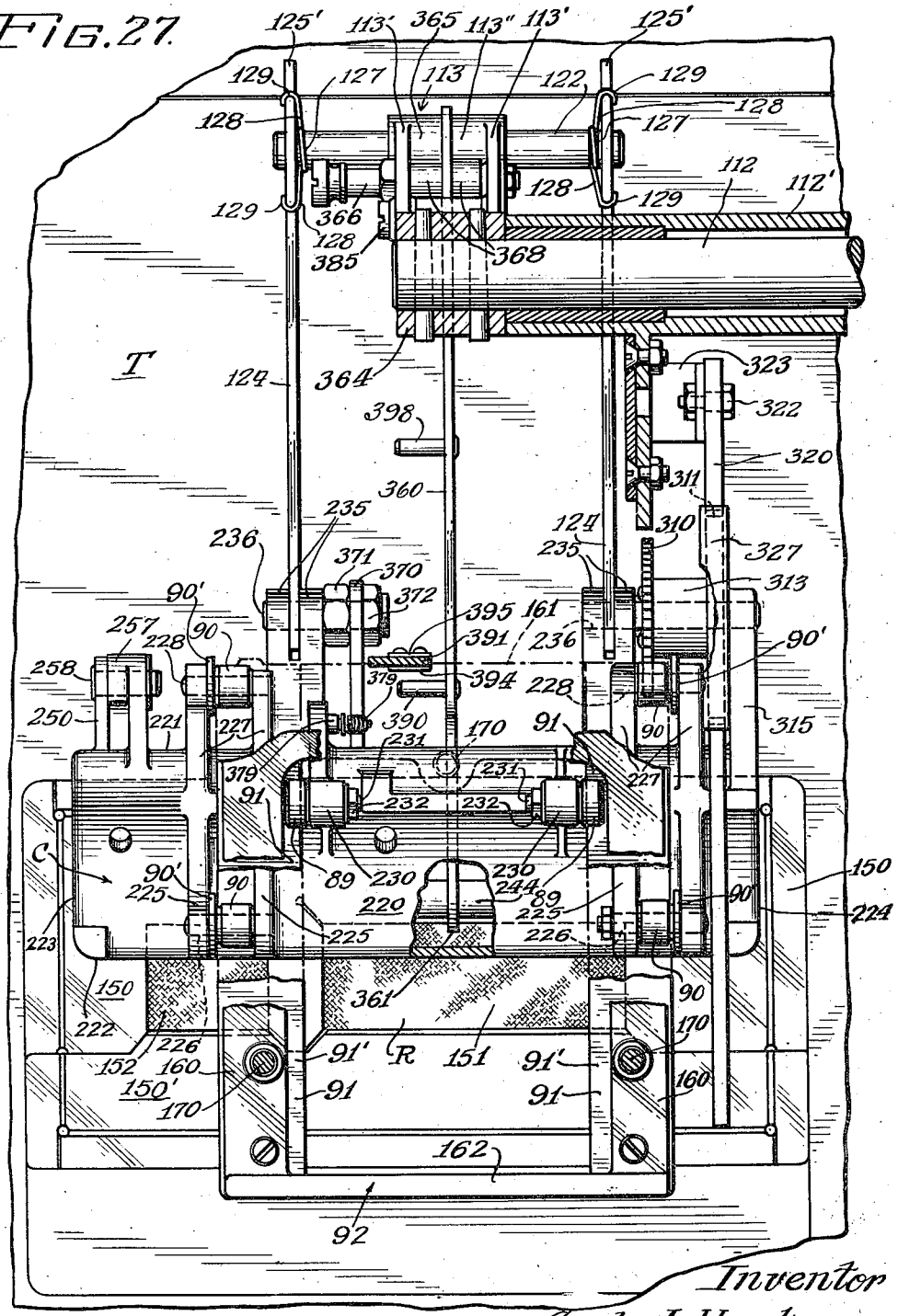
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FIG. 27.



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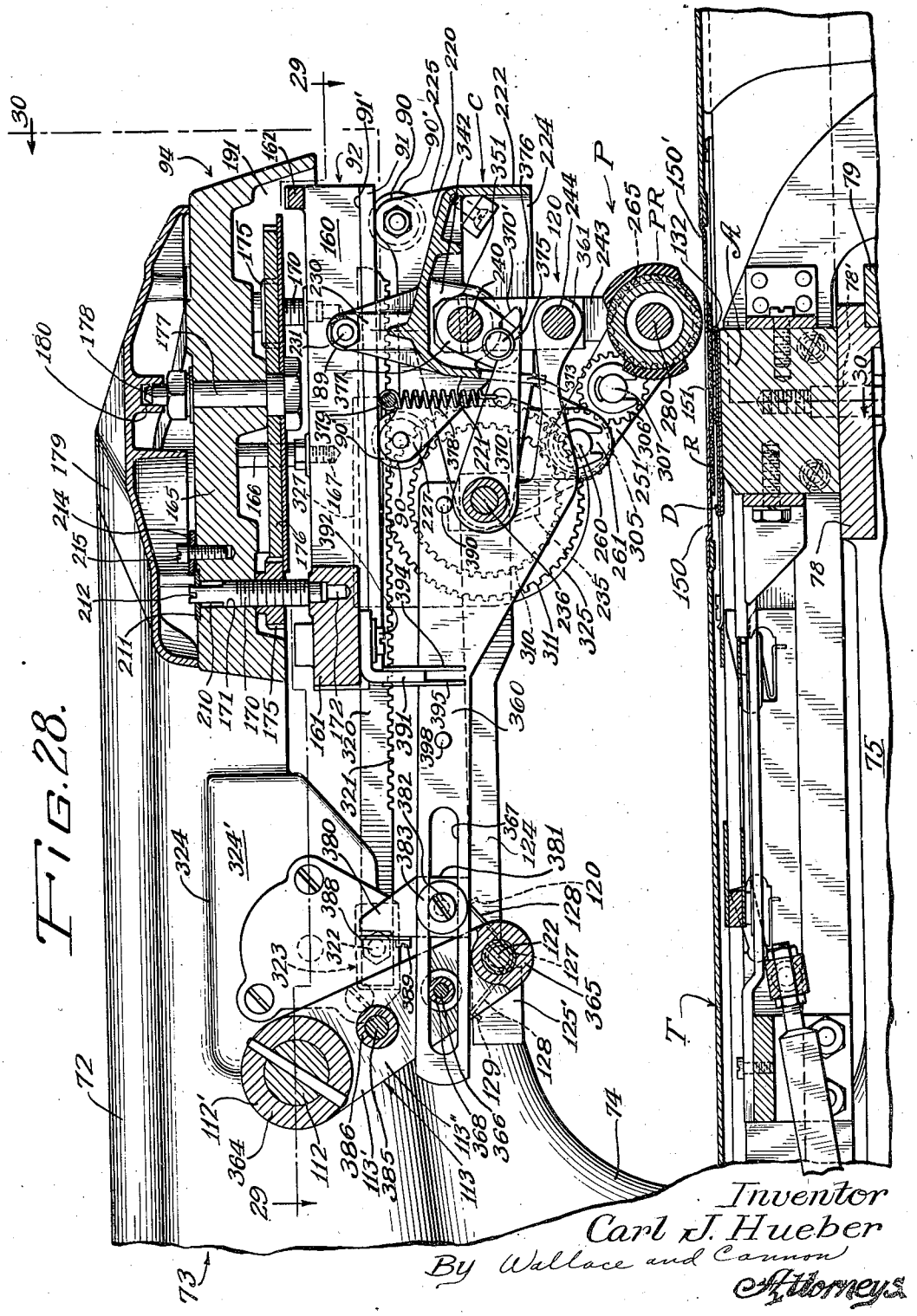


FIG. 28.

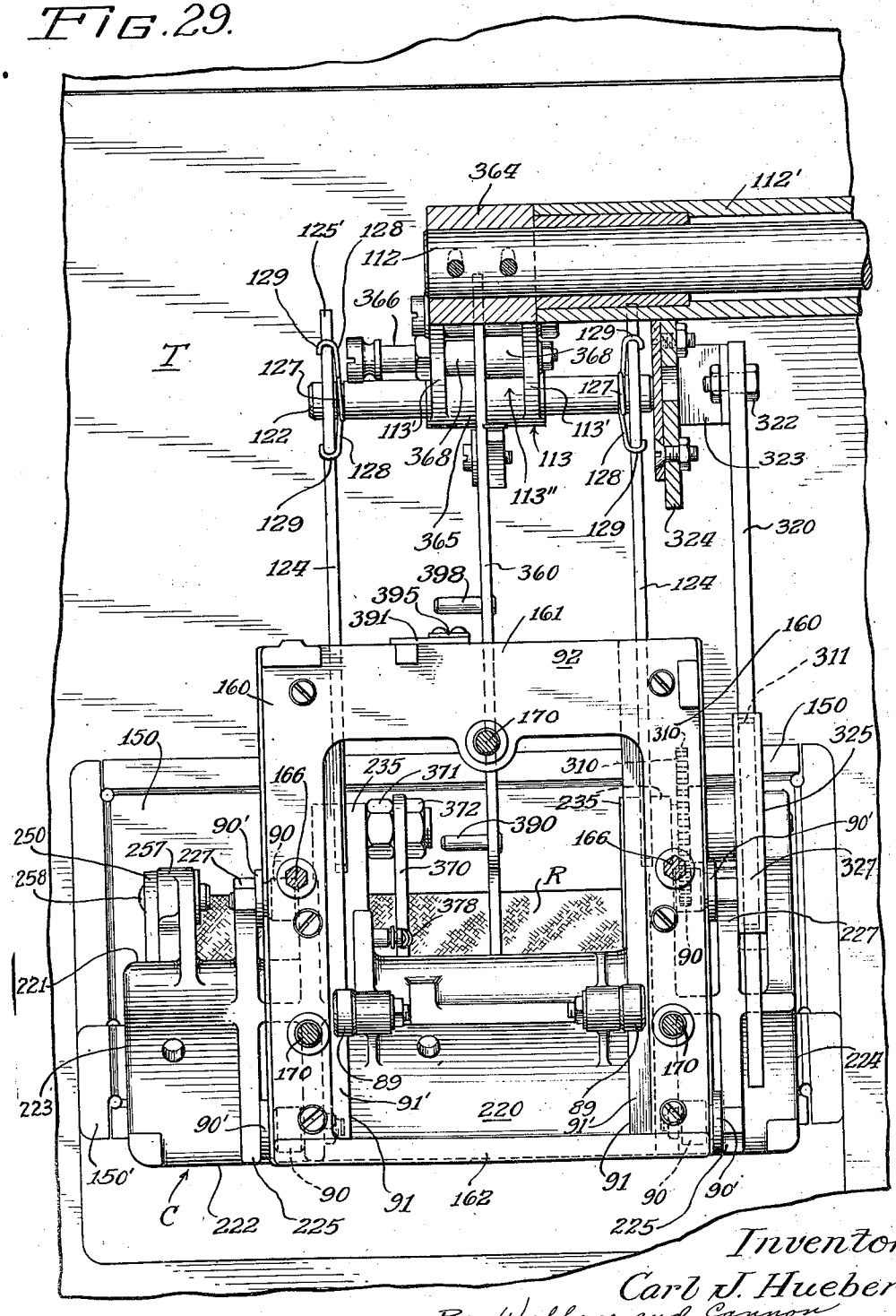
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FIG. 29.

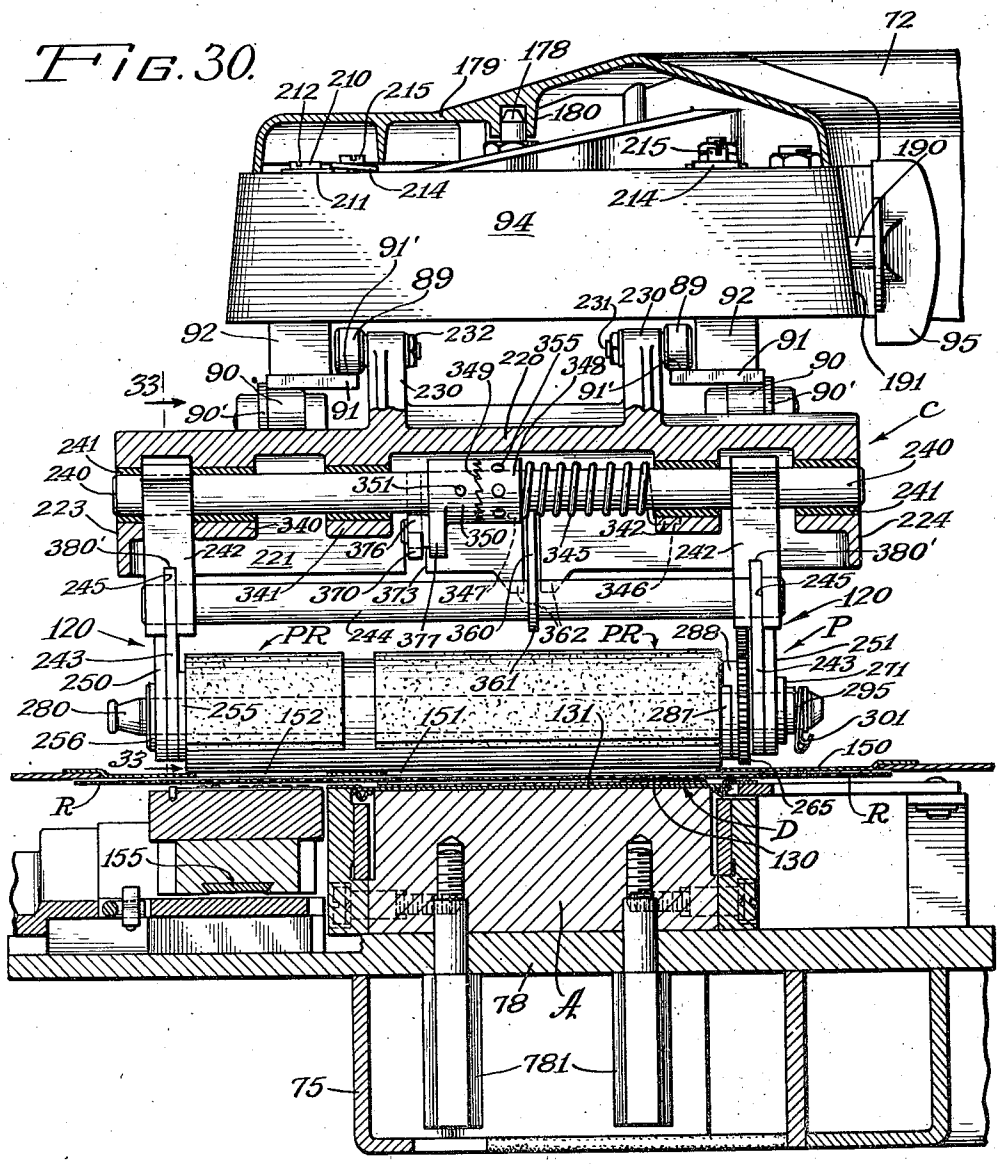


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FIG. 30.



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FIG. 31.

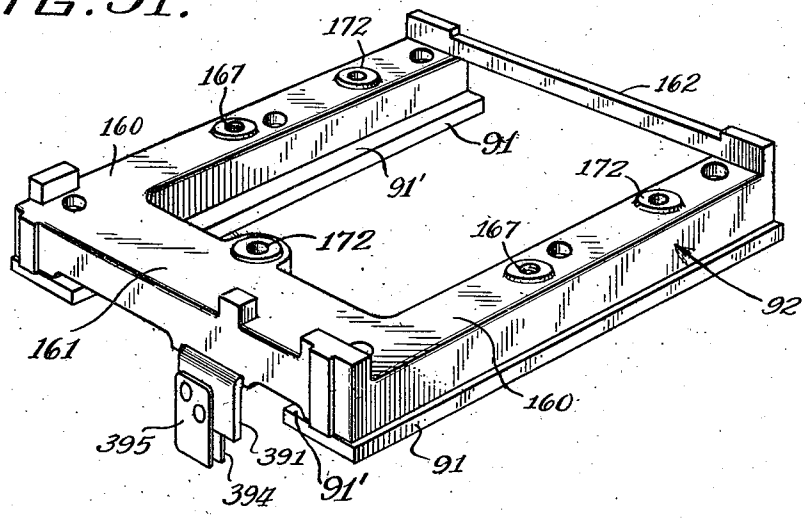


FIG. 32.

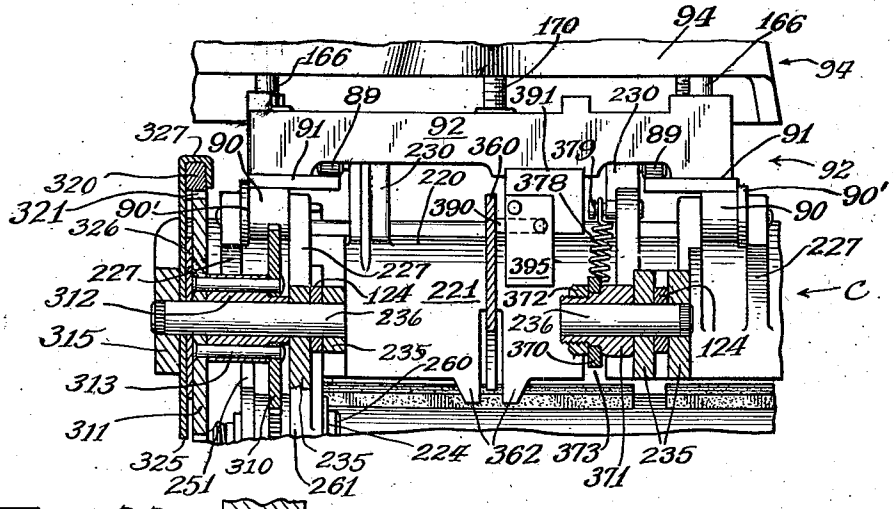
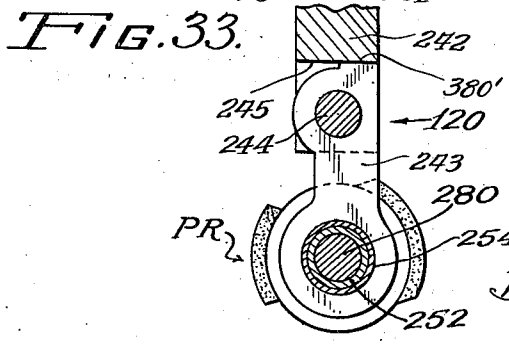


FIG. 33.



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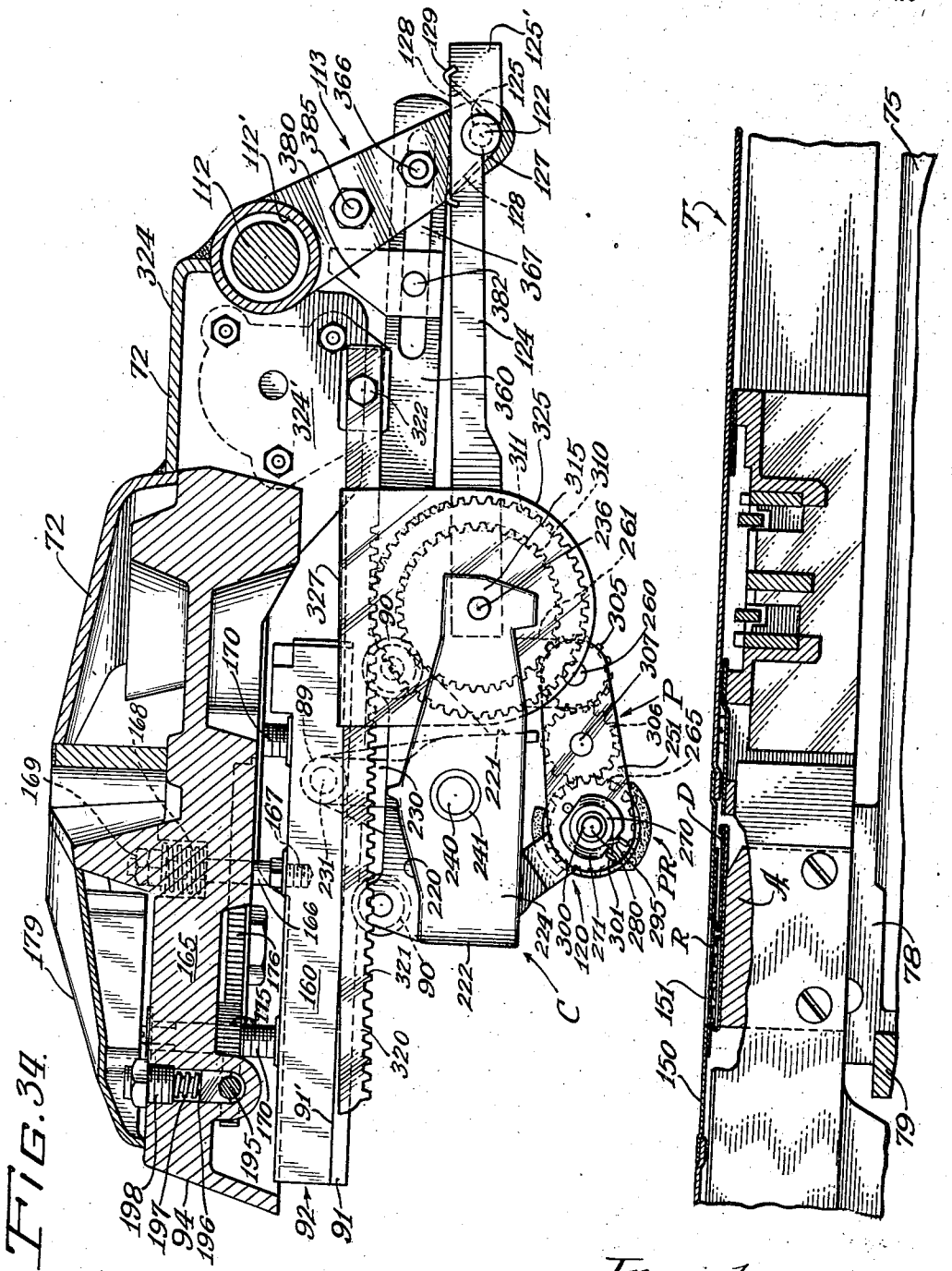


FIG. 34.

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FIG. 35.

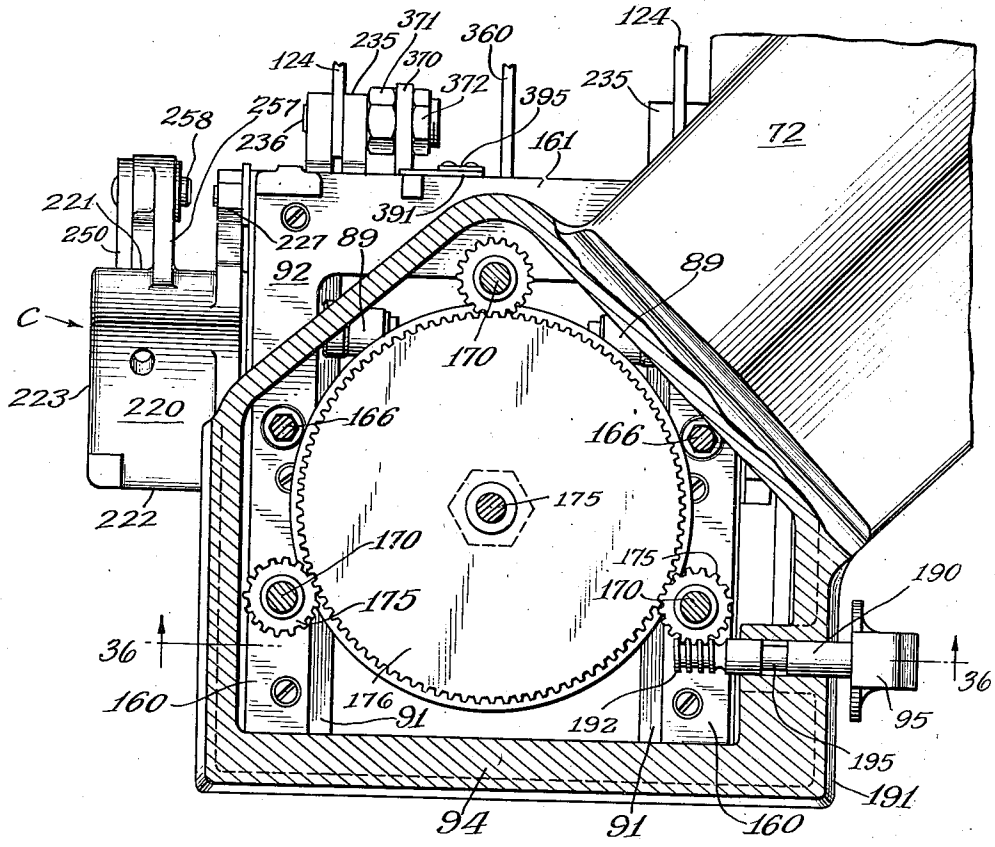
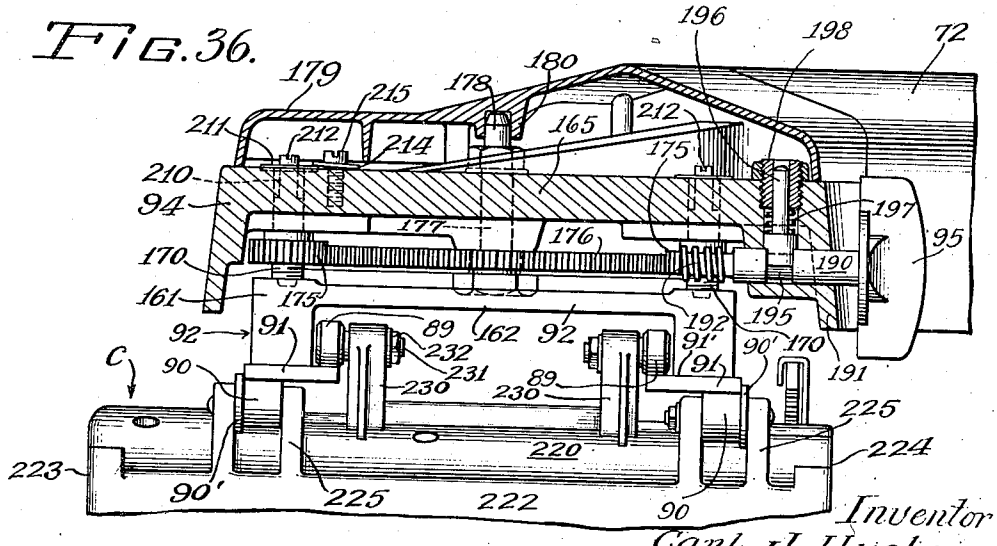


FIG. 36.



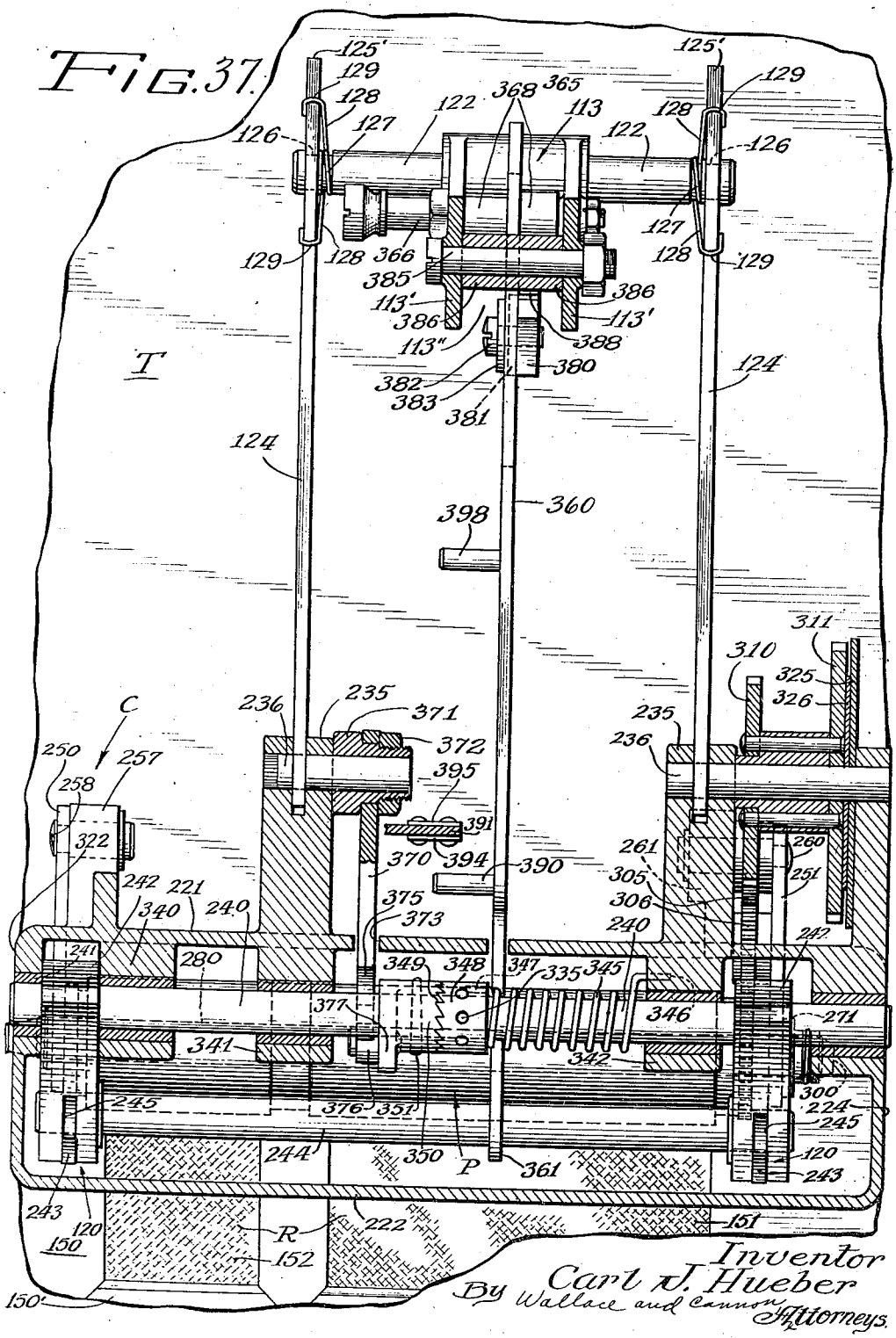
Inventor
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Fig. 37.



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Fig. 38.

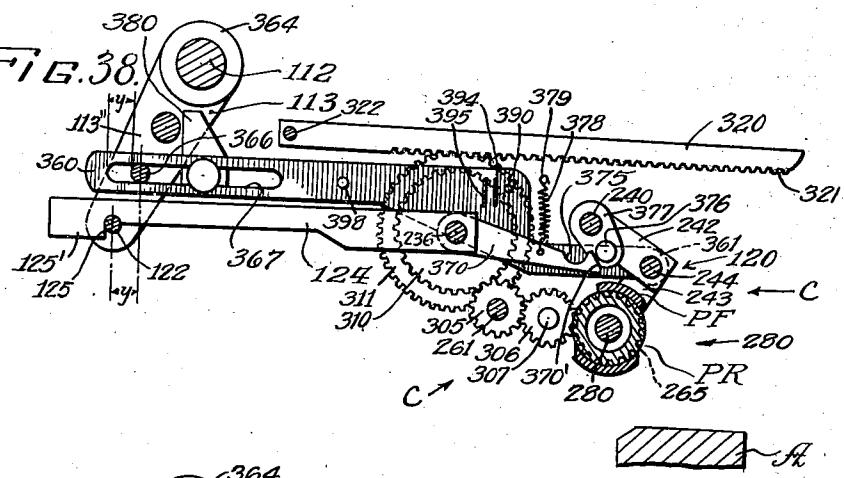


Fig. 39.

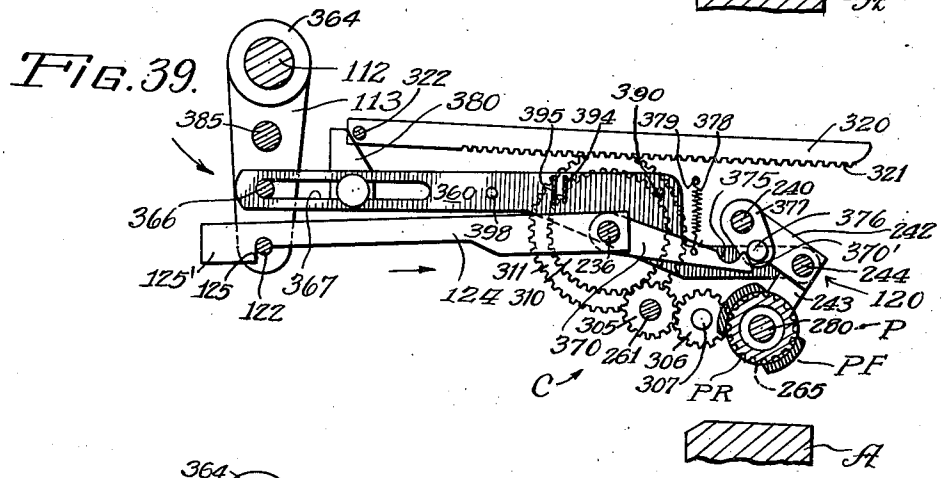
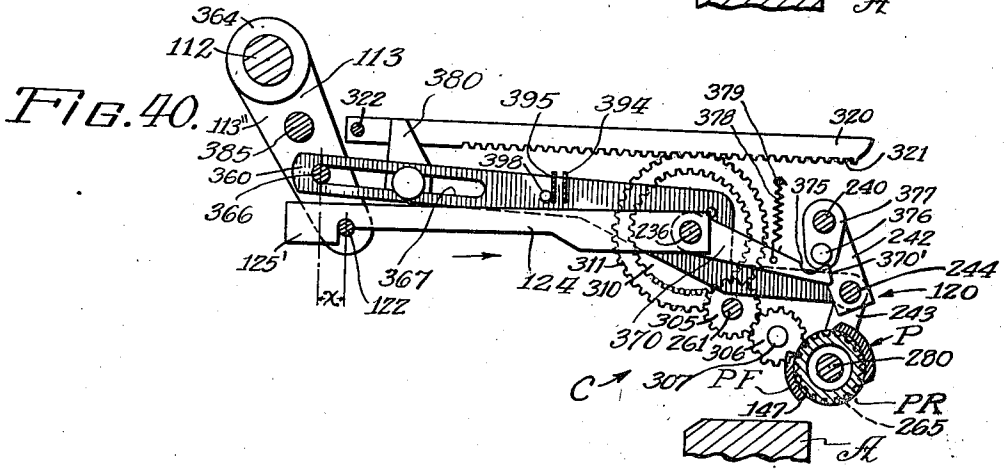


Fig. 40.



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FIG. 41.

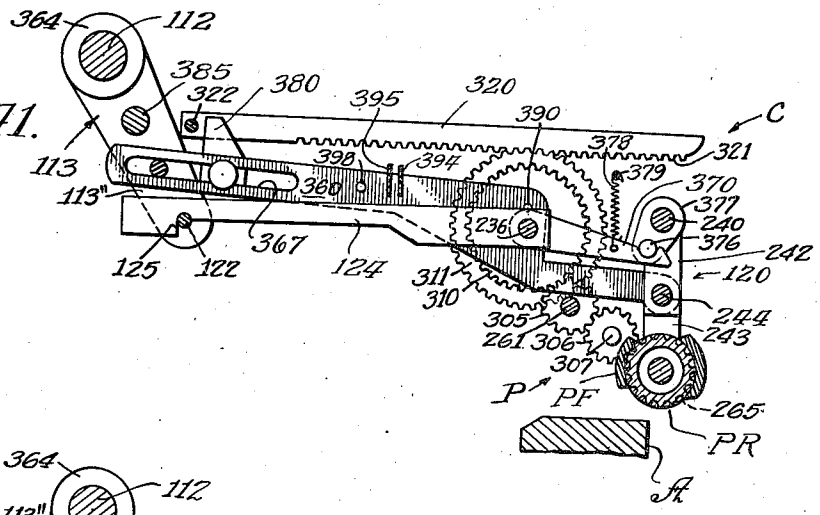


FIG. 42.

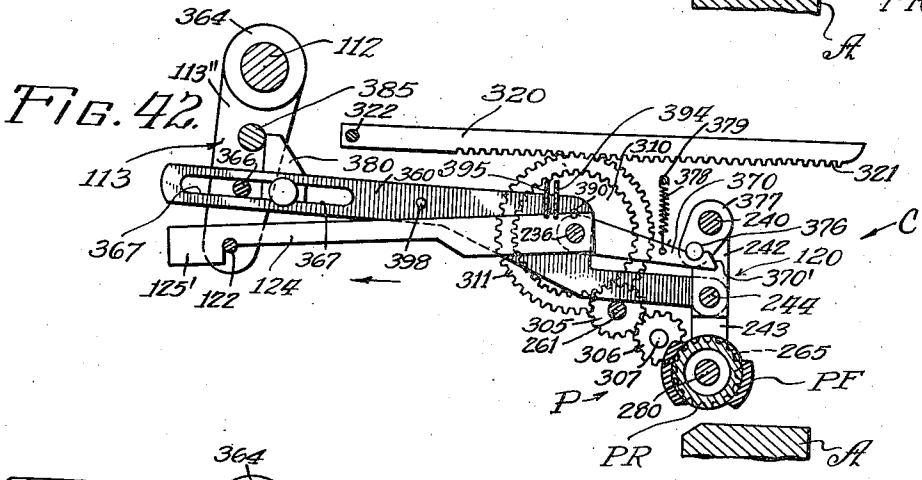
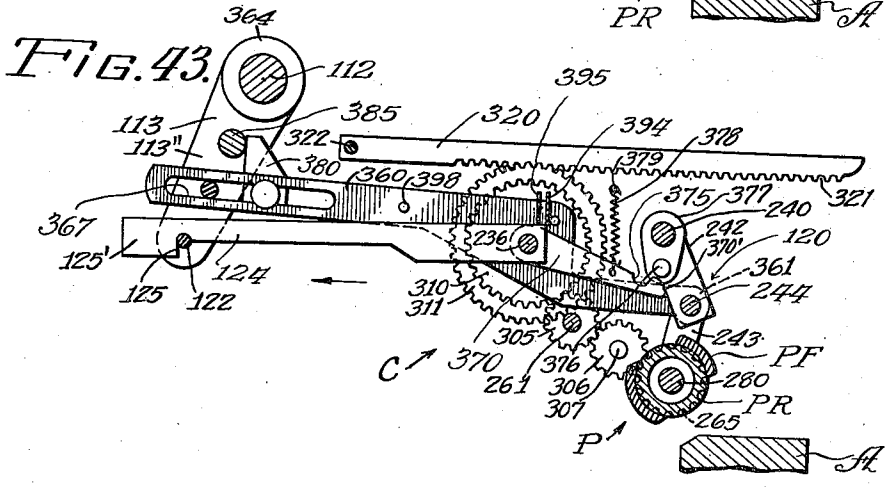


FIG. 43.



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FIG. 44.

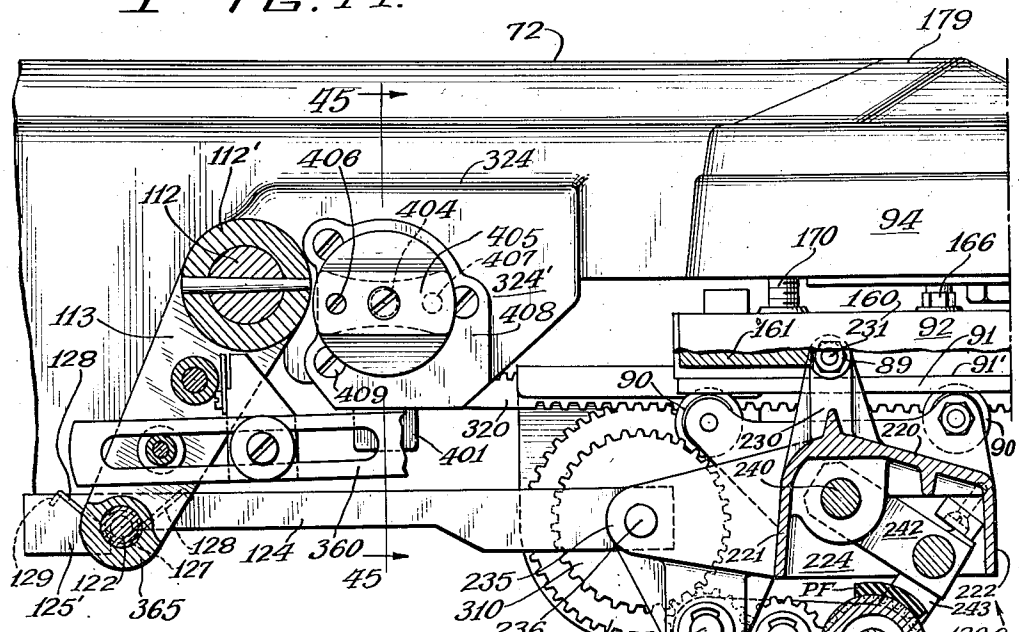


FIG. 45

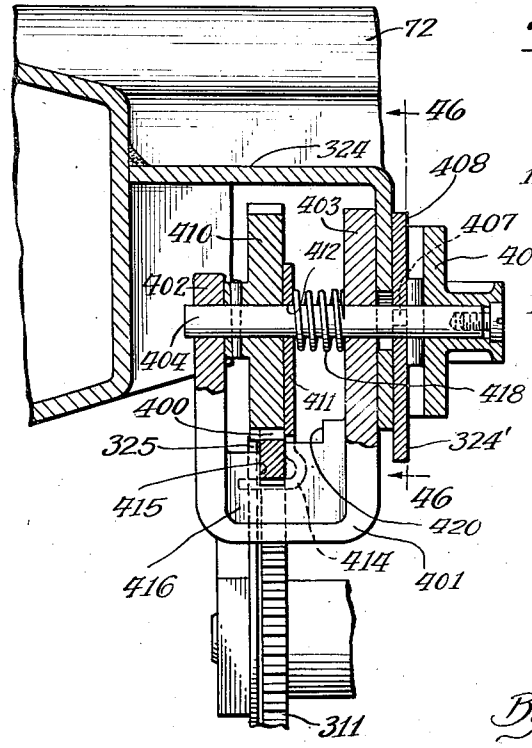


FIG. 46.

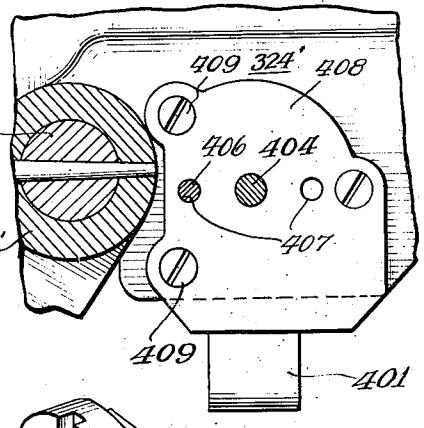
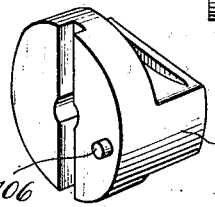


FIG. 47.



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FIG. 48.

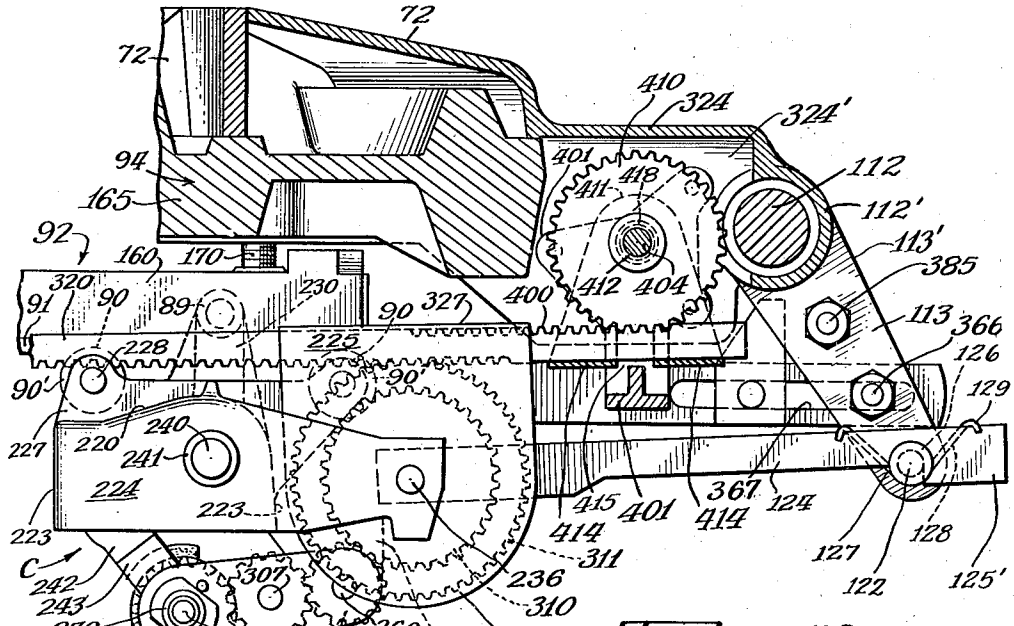


FIG. 49.

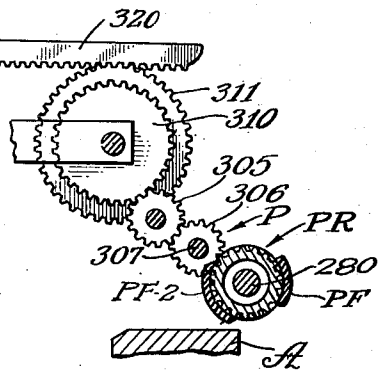
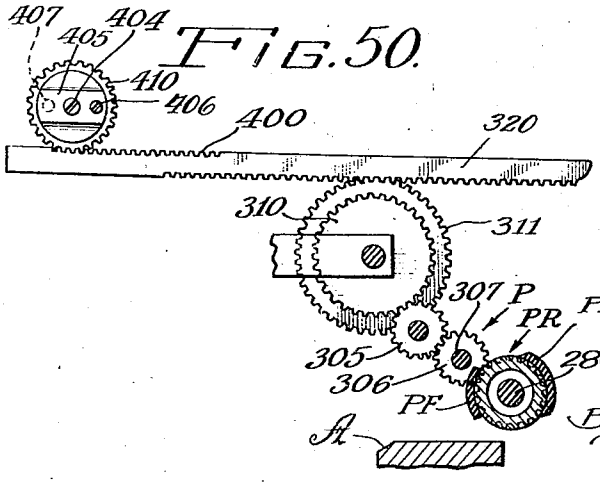


FIG. 50.



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PRINTING MACHINE

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FIG. 51.

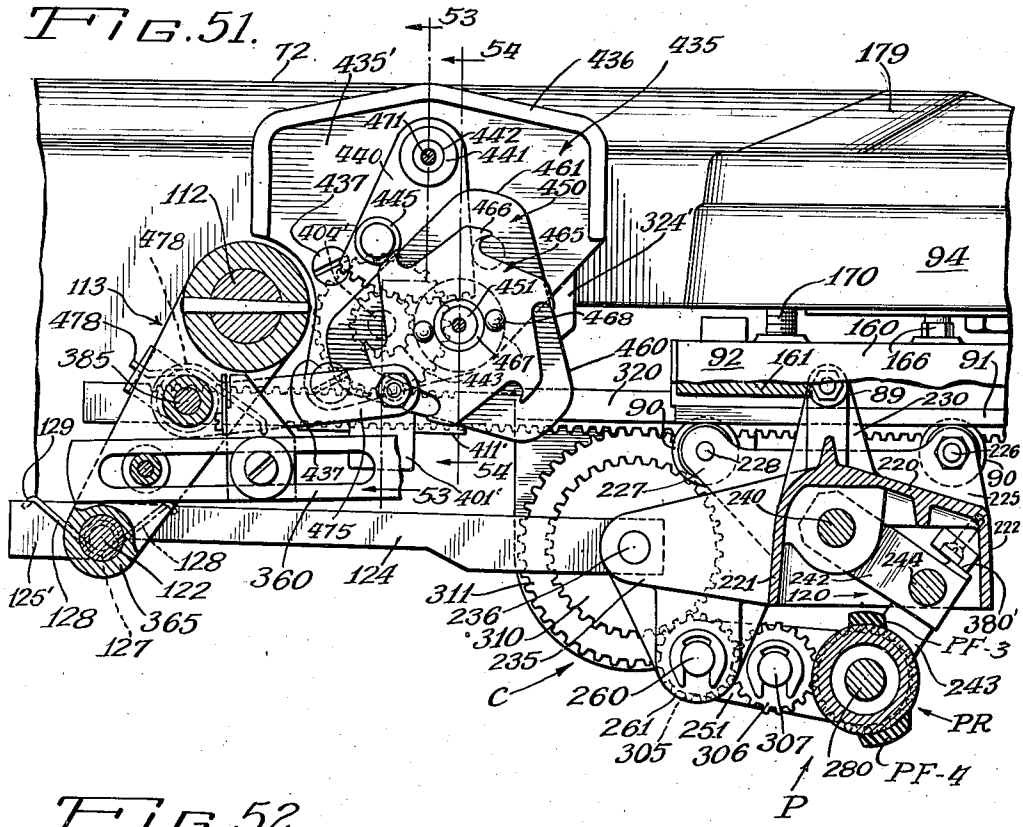
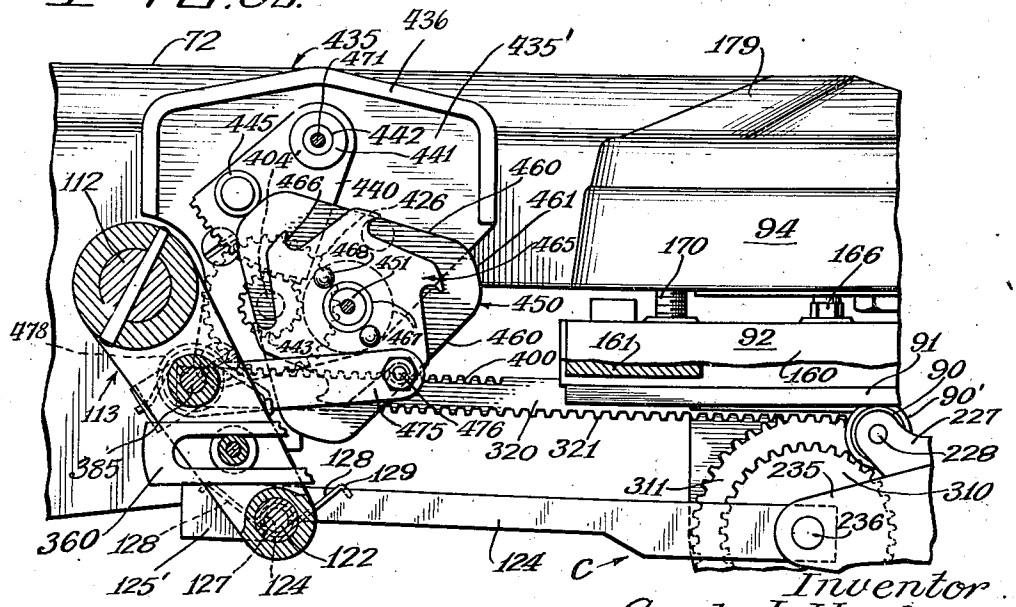


FIG. 52.



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FIG. 53.

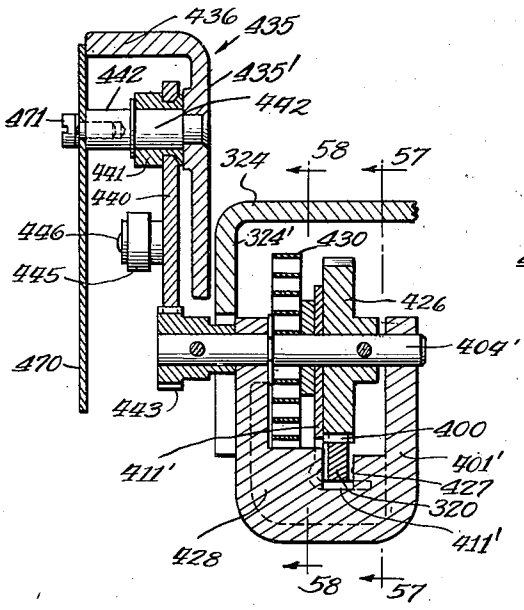


FIG. 54.

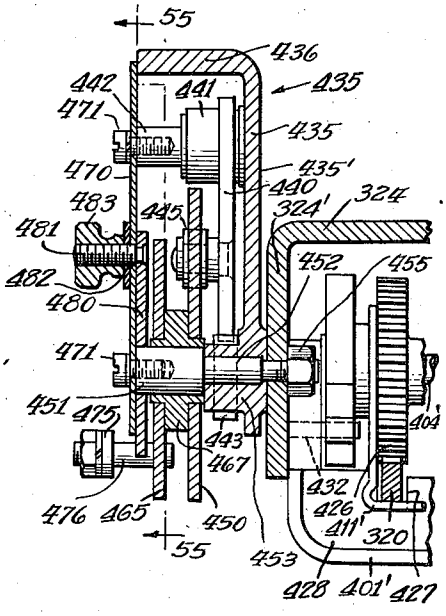


FIG. 55.

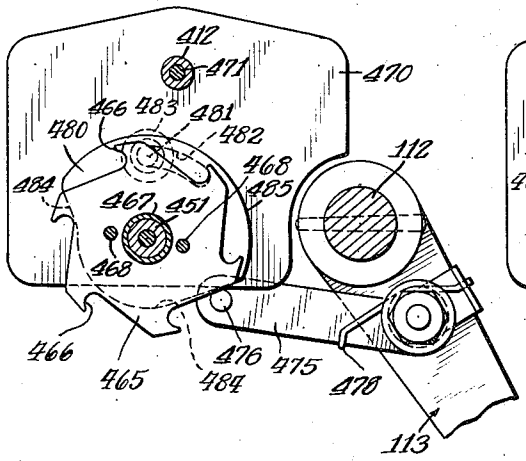
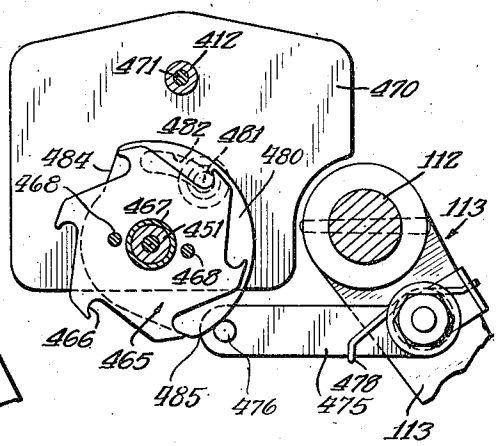


FIG. 56.



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Fig. 57

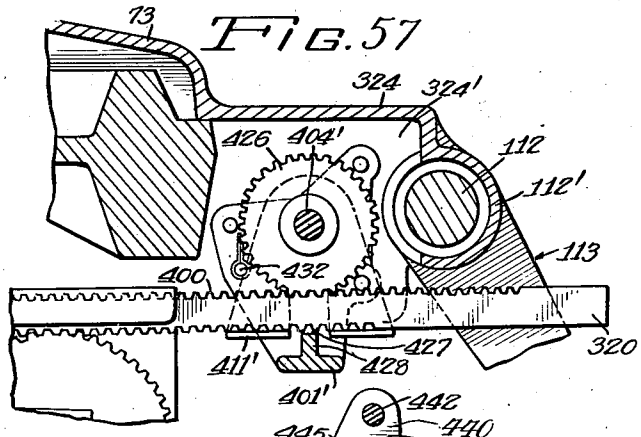


Fig. 58

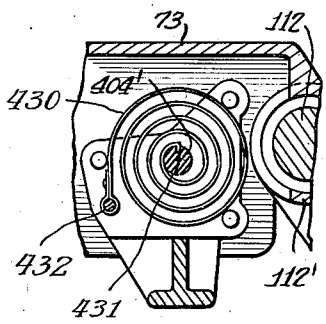


Fig. 59.

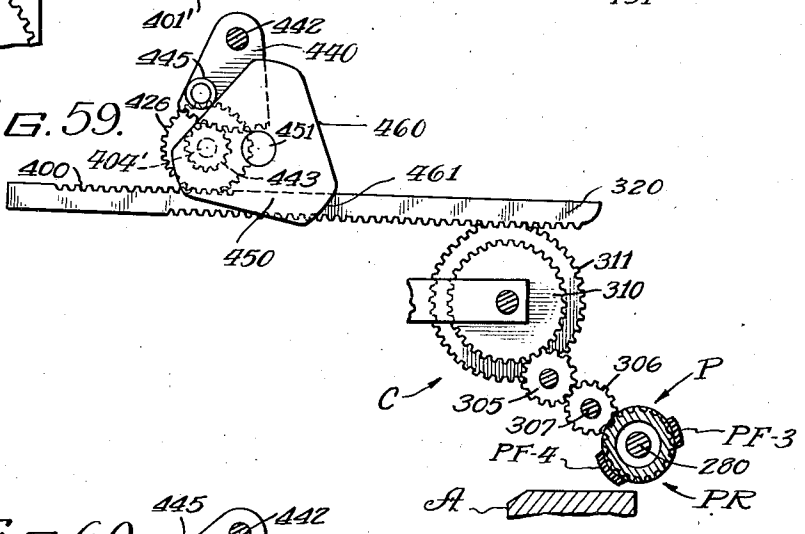
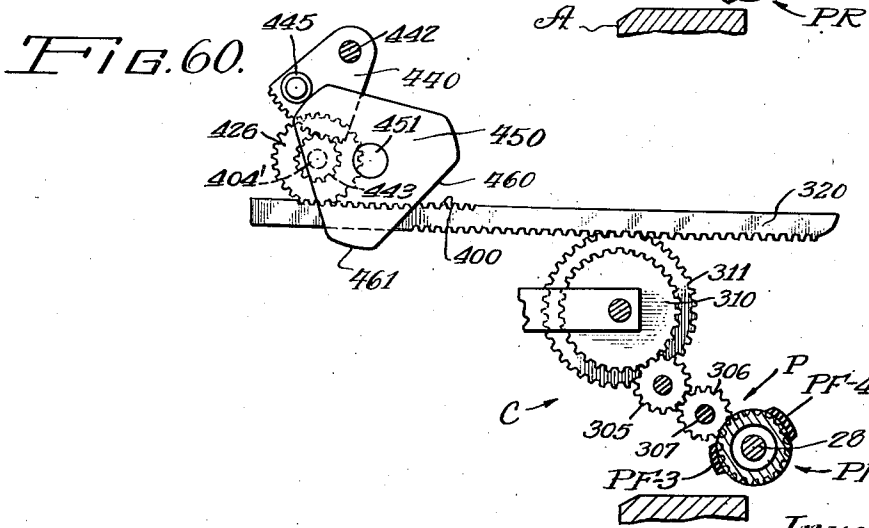


Fig. 60.



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Patented Oct. 10, 1944 2,359,849

UNITED STATES PATENT OFFICE

2,359,849

PRINTING MACHINE

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Application October 17, 1940, Serial No. 361,530

41 Claims. (Cl. 101—56)

This invention relates to printing machines and more particularly to platen mechanisms for use therein.

In printing machines of the character through which printing devices are sequentially passed and in which machines the platen mechanism of the present invention is particularly useful, the platen mechanism functions to effect printing operations from the respective printing devices in a series thereof passed sequentially and in a step-by-step manner through the machine. One or more printing impressions may be made from each of the printing devices, the platen mechanism being operated through the printing or impression forming cycle each time such a printing impression is to be made.

The printing devices from which the printing impressions are formed in such machines may take many different forms, but in most instances each printing device carries a plurality of lines of printing characters such as embossed type from which printing impressions may be made upon a sheet or form. While a wide variety of printing devices, of the character sequentially passed through printing machines such as those to which the present invention pertains, have heretofore been provided, that disclosed in Mohler Patent No. 1,812,894, patented July 7, 1931, is typical of such devices. A printing device of this kind includes a carrier or frame having an embossable metal printing plate removably retained in position thereon, type characters being embossed on such a plate to appear in relief on the operative face thereof. Type characters have also been embossed in a so-called one-piece printing device of the character disclosed, for example, in Duncan Patent No. 1,026,246, patented May 14, 1912, and devices of this character are frequently utilized in printing machines of the kind to which this invention relates. Furthermore, in some instances type characters have been formed in suitable stencil paper, carried by a frame of cardboard or other material, and suitable means have been provided in printing machines through which such devices were fed to apply ink to the type characters on printing devices of this character and for pressing a sheet into engagement with the inked type characters to thereby have an impression made thereon. Irrespective of whether printing devices embodying embossed type characters or type characters afforded in a stencil sheet were utilized, it has been necessary, in printing machines through which the devices were passed, to apply printing pressure as by means of a platen mechanism in order that printing impressions would be produced in the machine.

When a printing operation is to be performed from a printing device having embossed type, the printing device, at printing position in the machine, is located on an anvil with the printing characters facing an adjacent, but slightly spaced, surface or face of an inking ribbon, while the sheet or form upon which the printing impression is to be made is located in opposed relation to the opposite face of the inked ribbon, and a resiliently-faced platen roller is rolled across the back or reverse side of the sheet or form so as to press the form and the inked ribbon toward and into operative printing contact with the printing device and with each other to thereby produce a printing impression from the printing device through the inked ribbon and onto the form or sheet. In such printing operation, the rolling movement of the platen roller is such that the roller moves in a direction transversely of the lines of type on the printing device, thereby to form printing impressions from the lines of type successively.

Printing devices of the character used in such printing machines are designed for use in the preparation of a wide variety of business instruments, and for this reason such printing devices, in addition to name and address data, usually bear printing characters or lines of printing characters which are of specialized application or use and which therefore are not used in the preparation of certain classes of instruments. When it is desired to form printing impressions from certain of the lines of type characters of a printing device, to the exclusion of certain other lines of type characters of the printing device, such selection of the lines of type to be printed is effected by modification or cutting away of portions of the resilient sheathing of the platen roller and by correspondingly controlling the rotative positioning and rolling movement of the platen roller so that the resilient sheathing of the platen roller moves into and through printing cooperation with only those lines of type characters from which printing impressions are to be made.

In thus controlling the positioning and rolling movement of the platen roller, gearing means is employed to control and actuate the platen roller, thereby to determine in a positive manner the initial positioning of the effective platen face or sheathing with respect to the lines of type characters and to maintain the desired rolling rela-

tion of the platen roller with respect to the lines of type characters as the printing operation progresses. Thus when the platen roller is initially positioned adjacent what may be termed the first line of type of the printing device and is ready for rolling movement toward and across this first line of type and the other lines of type in succession, the platen roller is located in a predetermined initial rotative position, and as the platen roller moves through its rotative or rolling movement, the resilient sheathing thereof normally moves into printing cooperation with the lines of type of the printing device successively from the first line of type to the terminal or last line of type, after which the platen roller is withdrawn from its operative contact with respect to the sheet or form.

In the event that the user wishes to avoid printing of the first line of type of the printing device, the sheathing of the platen roller is so formed or cut away that it does not enter into printing cooperation with the first line of type, thereby causing the platen roller in a printing movement thereof to rotate or roll freely and in spaced relation to the sheet or form until it reaches the space between the first and second lines of type of the printing device, after which the resilient sheathing enters into printing cooperation with the back of the form and with the second line of type of the printing device. The form of the sheathing may of course be so modified as to avoid printing of two or more lines or parts of lines of type characters in the initial portion of its printing stroke, and such modification may be termed the modification or setting of the initial line cut-off of the machine, since the effect is to cut off or prevent printing from certain lines or portions of lines of type characters in the initial portion of the printing movement of the platen roller.

If printing from one or more of the final lines of type of the printing device is to be avoided, the resilient sheathing of the platen roller may be similarly formed or cut away so as to avoid printing cooperation of the sheathing with such final line or lines of type characters, and such termination or variation of the final portion of the printing operation may be termed the adjustment of the final or terminal line cut-off. This terminal line cut-off may, in a measure, be determined and adjusted by adjustment of the point of withdrawal of the platen roller, but in most instances the terminal line cut-off is attained by a combination of these two actions, the resilient sheathing being cut away to the desired form and the withdrawal of the platen roller being correspondingly adjusted to take place immediately after completion of the printing of the last selected line of type, thereby to cooperate in producing clear and unsmudged printing impressions.

The adjusted or setting of the line cut-off in printing machines of this character is in most instances made with considerable care and precision in order that clear and unsmudged printing impressions may be obtained, but in prior platen mechanisms, such as that shown and claimed in my prior patent No. 2,104,863, issued January 11, 1938, it has been found that other necessary adjustments of the platen mechanism may tend to disturb the line cut-off adjustment, with the result that smudged printing impressions may be produced even though the line cut-off has been initially set or adjusted with considerable care. Such disturbance of the line cut-off adjustment in prior platen mechanisms has resulted in some instances from the levelling adjustment of the platen mechanism and in every instance where the adjustment of the printing pressure applied by the platen roller has been varied.

Such adjustment of the printing pressure applied by the platen roller is of particular importance where the printing impression is to form the address data and salutation of a printed letter, for in such instances it is highly desirable to match the color or intensity of this printing impression with that of the printed letter, thereby to produce a personalized letter of neat and effective appearance. While preservation of the desired line cut-off and the proper matching of color intensity of the printed name and address data with the printed body of the letter are both of great importance in the production of such personalized letters, the smudges resulting from improper line cut-off are the most noticeable and most objectionable. As a result it has been found that operators of prior machines have had a tendency to avoid the making of major adjustments of the printing pressure, since such adjustments of printing pressure often disturbed the line cut-off adjustment and necessitated readjustment of the line cut-off in order to prevent smudging of the work. Hence the very purpose of such personalized letters has in many instances been defeated by the contrast of color of the name and address data with the printed body of the letter.

Important objects of the present invention are, therefore, to enable the adjustment and set-up of the platen mechanism of a printing machine of the aforesaid character to be accurately and readily effected and to enable adjustment of the printing pressure of the platen mechanism independently of the line cut-off adjustment thereof, thereby to promote the production of more perfect impressions, as in the case of individually addressed letters and the like.

In the use of printing machines of the character in which the present platen mechanism finds its principal field of use, it is often desirable to perform a series of printing operations wherein different line cut-offs are employed alternately or in some other sequence. As an example of such a use, it may be desirable to print related personalized letters and to address envelopes therefor, and in such an instance each printing device usually carries four lines of type, the top line being the name, the next line the street address, the next line the city and state, and the bottom line, which in most instances is spaced an extra distance from the adjacent line, constituting a salutation. Thus when the name and address data and the salutation are to be printed upon a letter, the four lines of type on the printing device are printed, while in the addressing of the related envelope, the initial line cut-off of the platen mechanism is so arranged and adjusted that the salutation line of the printing device is not printed, and the printing operation is confined to the three lines of the printing device which carry the name and address data. With prior roller platen mechanisms, it has been necessary to run the entire group of printing devices through the printing machine with the initial line cut-off of the platen mechanism set in one position of adjustment, thereby to print the appropriate name, address and salutation upon each of the entire group of individually addressed letters, and then to change the initial line cut-off of the platen mechanism and thereafter run the entire group of printing devices through the printing

machine a second time so as to print the corresponding name and address data upon a group of envelopes. These two groups, that is, the individually addressed letters and the individually addressed envelopes therefor, must then be sorted or otherwise matched so as to insure that each letter is enclosed in the envelope which pertains thereto.

Another object is, therefore, to enable printing of at least two series of related documents or papers embodying different line cut-off adustments in a single run of the machine, which is to say, to require that the series of printing devices be passed through the machine but once in the production of such a related series of documents; and a further object is to render the line cut-off of the platen mechanism readily shiftable from one line cut-off adjustment to another; to render such shifting of the line cut-off adjustment automatic; to enable such automatic shifting of the line cut-off to be easily dispensed with in the event that the same line cut-off is desired in successive printing operations; and to enable such automatic shifting of the line cut-off adjustment to be readily varied so that the number of printing impressions made while the line cut-off adjustment is in any particular one of its automatic settings may be readily varied and adjusted.

Another instance where successive printing impressions are made from different portions or lines of a printing device is found in multiple column listing applications of printing machines of the aforesaid character. For example, the name carried by a printing device may be printed in one column, while the address or other related data carried on the printing device may be printed in another column, as in the preparation of tax, accounting or like forms. The machine disclosed herein is adapted for the performance of such multiple-column listing operation through the use of the two-column lister disclosed and claimed in my co-pending application, Serial No. 410,097, filed September 8, 1941. In such work each printing device is disposed in printing position and the sheet or form and such device are relatively positioned in one relation for the performance of a first printing operation and in a second relation for the performance of a second printing operation. The desired selection of the lines of type to be printed in such successive printing operations has heretofore been accomplished by resort to shields for blocking off the undesired lines or to the use of sectional stamper or snapping type platens, and the different sections of such platens have been selectively actuated in accordance with the position or relation of the form with respect to the printing device at printing position.

Another object of the present invention is to enable a novel roller platen to be employed in such multiple-column listing or printing operations; to effect such selection of the material to be printed solely by the roller platen mechanism; to effect automatic selection of a plurality of line cut-off adjustments of such roller platen mechanism; to render such automatic selection readily variable so that the number of impressions automatically effected with a particular line cut-off adjustment may be easily changed or varied; and to produce a roller platen mechanism which is relatively simple and effective in structure and operation so as to be fitted for use in relatively simple and inexpensive printing machines, and which may be readily associated with automatic means for selectively rendering different line cut-off adjustments effective in successive printing operations.

Roller platen mechanisms of the general type to which the present invention relates employ platen rollers which are faced with a resilient material which in the printing operation engages the paper or form upon which the printing impression is to be made, and the character of the printing impression varies considerably with the resiliency or hardness of the coating material or sheathing which is employed upon the platen. In order to produce the best appearance in the printing impression, it is often necessary to, in effect, match the platen hardness with the character of the paper which is being used, and with the inking ribbon, and it has been found that operators of printing machines of this character often avoid the changing of the platen or matching of the characteristics of the platen roller with the other factors where the run of printing operations is to be relatively short. This failure to substitute a platen having the proper facing has been mainly due to the difficulty involved in removing and replacing the platen rollers, and another object of the present invention is to enable variation of the hardness of the effective portion of the platen in a simple manner, thereby to enable the operator to obtain more satisfactory printing impressions without the necessity for changing of the platen roller, and an object ancillary to the foregoing is to equip a roller platen with faces of different hardness and to enable such faces to be rendered effective selectively.

A further object is to provide a platen mechanism of the geared roller type with a plurality of sectors about the cylindrical face of the platen roller, in any of which sectors a complete arcuate platen face may be provided, and to provide, in connection with such a platen roller, mechanism which is manually operable by the operator to render the platen facing in any one of these sectors effective in a printing operation.

In roller platen mechanisms as heretofore constructed, the platen roller has been mounted upon a reciprocable carriage and has been provided with mechanism operable in the movement of the carriage in one direction to shift the platen roller toward the anvil upon which the printing device is positioned, and in the return movement of the carriage the roller platen is maintained in this printing relation and is rolled across the face of the printing device, there being, of course, an inking ribbon and a work sheet or form interposed between the printing device and the platen roller. After the rolling movement of the platen roller across the sheet or form has accomplished the printing of the desired number of lines of type from the printing device onto the form, it has been customary to retract the platen roller out of its operative contact with the sheet upon which the printing impression has been made, and it is, of course, desirable that this point of retracting movement be adjustable so as to provide for clear and unsmudged printing of different numbers of lines of type. In prior platen mechanisms, it has often been necessary to perform a relatively complicated adjustment of a plurality of adjusting devices in order to vary this point of retraction of the platen roller; and another object of the present invention is to simplify this adjustment and enable the operator to perform the adjustment by manipulation of readily accessible adjusting means; and a further object is to accomplish this

adjustment through the manipulation of but a single adjusting means.

In the performance of a printing operation in printing machines of the aforesaid character the platen carriage moves through a preliminary or conditioning stroke in one direction and is thereafter returned in the opposite direction through its operative stroke during which the printing operation is performed. During the preliminary or conditioning stroke of the platen carriage, during which the platen roller is lowered or advanced to its operative position, and during such lowering of the platen roller, a preliminary or conditioning rotative movement is imparted to the platen roller so as to locate the platen face thereof in the proper rotative position to attain the desired line cut-off when the carriage and the platen are subsequently moved through the reverse or printing stroke.

When a number of carbon copies are to be printed in a printing machine of the aforesaid character, as by means of sheets of carbon paper inserted between a plurality of sheets or forms, it is essential, in order to prevent smudging of the copies, that appreciable pressure upon the sheets be avoided during the preliminary or conditioning movements of the platen roller, and an important object of the invention is to prevent smudging of the copies in such instances.

Other objects related to the foregoing are to provide a platen mechanism wherein the conditioning or preliminary rotative movement of the platen roller is completed before the platen face exerts any appreciable pressure upon the back of the upper sheet of such a group of sheets; to render the last portion of the downward movement of the platen roller substantially independent of continued forward movement of the platen carriage; to reduce the tendency of geared platen rollers of this character to shift the sheet or one of a group of sheets during the conditioning movement of the platen roller; to reduce the amount of rotative movement of the platen roller while the platen roller is relatively close to its lower or operative positions; and to provide a geared roller platen mechanism wherein a primary means is employed to advance the platen roller toward the anvil in timed relation to the advancing or forward movement of the platen carriage and to supersede the primary advancing means by a secondary advancing means which operates independently of the forward movement of the platen carriage to complete the advancing movement of the platen roller to its fully extended or operative printing position.

Further objects related to the foregoing are to provide a geared roller platen mechanism wherein a single means is provided for maintaining the platen roller in its fully lowered position and for accelerating the retracting movement of the platen roller upon completion of the printing operation; to render such acceleration of the retracting movement of the platen roller readily adjustable; and to correlate the operative movements of the platen roller to produce more legible and more perfect printing impressions.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show preferred embodiments and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings,

Fig. 1 is a front elevational view of a printing machine having a platen mechanism embodying the features of the present invention;

Fig. 2 is a plan view of the printing machine illustrated in Fig. 1;

Fig. 3 is a vertical cross-sectional view taken substantially along the line 3—3 on Fig. 2 and showing a portion of the mechanism which drives the platen mechanism;

Fig. 4 is an enlarged sectional view showing a portion of the mechanism of Fig. 3 on an enlarged scale;

Fig. 5 is a fragmental sectional view taken along the line 5—5 on Fig. 2 and illustrating the one-revolution clutch which is embodied in the drive of the platen mechanism of the present invention;

Fig. 6 is a perspective view taken generally from the rear of the platen mechanism of the present invention and illustrating this platen mechanism in its operating position from which the platen roller is adapted to be rolled rearwardly across a printing device so as to make a printing impression therefrom;

Fig. 7 is a fragmental elevational view taken partially in section on the line 7—7 on Fig. 2 and illustrating the platen mechanism with the platen roller in its elevational position;

Fig. 8 is a sectional view showing the platen mechanism in front elevation with the platen roller in its elevated or retracted position;

Fig. 9 is a fragmental plan view illustrating the platen mechanism of the present invention supported on an impression arm;

Fig. 10 is a front face view of a printing device adapted to be employed in the printing machine herein described;

Fig. 11 is a diagrammatic view showing a platen roller having a particular platen face and its relation with respect to the printing device and form just prior to the commencement of the operative printing stroke;

Fig. 12 is a view similar to Fig. 11 with a different platen face formed to produce a different initial line cut-off operation;

Fig. 13 is a view similar to Fig. 11 wherein the platen face is arranged to attain the same initial cut-off as the form shown in Fig. 11 but is arranged to produce a different terminal line cut-off;

Fig. 14 is a fragmental view of a letter produced through the use of a platen face illustrated in Fig. 11;

Fig. 15 is a fragmental view of an envelope addressed through the use of the platen face illustrated in Fig. 12;

Fig. 16 is a perspective view showing the top of the reciprocable carriage of the present platen mechanism, the platen roller being shown in association therewith and in its retracted position;

Fig. 17 is a fragmental sectional view illustrating the relation of the platen roller to the printing device and the interposed inking ribbon and sheet;

Fig. 18 is a perspective view showing the bottom of the reciprocable platen carriage, the platen roller having been removed so as to show the relation of the other parts;

Fig. 19 is a sectional view illustrating the manner in which the platen roller is mounted and driven;

Fig. 20 is a perspective view of the platen roller;

Fig. 21 is an end elevational view of the platen roller as viewed from the line 21—21 on Fig. 20;

Fig. 22 is a fragmental sectional view taken along the line 22—22 on Fig. 8 and showing the manner in which the platen roller is mounted and secured in its operative position;

Fig. 23 is a sectional view taken along the line 23—23 on Fig. 22 and showing the structure by which the platen roller is engaged with its driving gearing;

Fig. 24 is a sectional view taken along the line 24—24 on Fig. 21 and illustrating the roller bearing means whereby the platen roller is supported;

Fig. 25 is a sectional view taken along the line 25—25 on Fig. 22 and illustrating the fastening means by which the platen roller is secured in place;

Fig. 26 is a fragmental vertical sectional view taken along the line 26—26 on Fig. 8 and showing the platen roller in its retracted position;

Fig. 27 is a fragmental plan sectional view taken along the line 27—27 on Fig. 26;

Fig. 28 is a fragmental sectional view similar to Fig. 26 but showing the parts in the positions which they occupy at another point in the operating cycle;

Fig. 29 is a fragmental plan sectional view taken along the line 29—29 on Fig. 28, this view being similar to Fig. 27 but showing the parts in the positions which they occupy at a different point in the machine cycle;

Fig. 30 is a fragmental vertical sectional view taken along the line 30—30 on Fig. 28 and showing the platen roller in its extended or operative printing relation of Fig. 28;

Fig. 31 is a perspective view of the supporting and guiding plate upon which the platen carriage rides in its reciprocatory movement;

Fig. 32 is a fragmental vertical sectional view taken along the line 32—32 on Fig. 26;

Fig. 33 is a fragmental vertical sectional view taken along the line 33—33 on Fig. 30;

Fig. 34 is a fragmental vertical sectional view taken along the line 34—34 on Fig. 7 and illustrates the platen roller in its retracted position;

Fig. 35 is a fragmental plan sectional view taken along the line 35—35 on Fig. 8 and illustrating the mechanism whereby the platen pressure is adjusted and the path of platen movement is levelled;

Fig. 36 is a fragmental vertical sectional view taken along the line 36—36 on Fig. 35;

Fig. 37 is a fragmental plan section taken along the line 37—37 on Fig. 26;

Figs. 38 to 43, inclusive, are diagrammatic views illustrating the positions which the parts of the platen mechanism assume in the various cycles of operation of the platen mechanism;

Fig. 44 is a vertical sectional view of an alternative form of the platen mechanism whereby different operative faces or segments of the platen roller may be rendered effective;

Fig. 45 is a fragmental sectional view taken along the line 45—45 on Fig. 44;

Fig. 46 is a fragmental sectional view taken along the line 46—46 on Fig. 45;

Fig. 47 is a perspective view of the adjusting knob embodied in the mechanism of Figs. 44 to 46, inclusive;

Fig. 48 is a vertical sectional view and similar to Fig. 44 but showing the opposite side of the platen mechanism so as to illustrate portions of the adjusting mechanism;

Figs. 49 and 50 are diagrammatic views illustrating the manner in which the different platen faces of the platen roller are rendered effective by the adjusting or setting mechanism;

Fig. 51 is a left-hand elevational view taken partially in section and illustrating another embodiment of the platen mechanism of the present invention;

Fig. 52 is a view similar to Fig. 51 and showing the parts at a different point in their operating cycle;

Fig. 53 is a fragmental sectional view taken along the line 53—53 on Fig. 51;

Fig. 54 is a fragmental sectional view taken along the line 54—54 on Fig. 51;

Fig. 55 is a fragmental view taken along the line 55—55 on Fig. 54 and illustrating the operation of some of the parts shown in Fig. 51;

Fig. 56 is a fragmental elevational view similar to Fig. 55 and showing the parts thereof in different positions;

Fig. 57 is a fragmental sectional view taken along the line 57—57 on Fig. 53;

Fig. 58 is a fragmental sectional view taken along the line 58—58 on Fig. 53; and

Figs. 59 and 60 are diagrammatic views illustrating the different positions which the parts assume in attaining selective operation of different platen faces.

The machine illustrated in the accompanying drawings in which the novel platen mechanism of the present invention is utilized is described in detail in my co-pending application, Serial No. 388,998, filed April 17, 1941, and reference may be had to this application for a detailed description of various operative parts of the machine. This machine comprises a desk-like frame 70 (Figs. 1, 2 and 3) having a table top T on which sheets such as envelopes, letterheads, bill forms, ledger sheets and the like may be arranged to receive printing impressions from printing devices D or the like sequentially passed through the machine. The printing devices D are introduced into a magazine M and are successively withdrawn from the bottom of the stack thereof in the magazine, by means described in detail in my aforesaid co-pending application, and after such withdrawal, the printing devices D are advanced in a step-by-step manner beneath the table top through a plurality of positions including a printing position or station, and after passing the printing station the printing devices D are deposited in a collecting drawer K located beneath the table top T as shown in Figs. 1 and 3. In the course of such advancing movement, the printing devices D move past a sensing station SE whereat indicating or control means such as tabs 71 may be sensed by suitable sensing means, of the general character described in said co-pending application, for the purpose of producing print or skip operation of the machine or like control operations. In the course of their subsequent advancing movement after passing the sensing station SE, the printing devices D come to rest at the printing position which in the present machine is defined in part by an anvil A upon which each printing device D is disposed beneath an inked ribbon R for the performance of the desired printing operation. While a printing device D is thus located at printing position, a sheet or form S upon which a printing impression is to be made is positioned face down on the table top T over

the inked ribbon R and the printing device D, and a printing impression is made therefrom by operation of a platen mechanism P disposed over the anvil A in spaced relation to the anvil A and the table top T. The platen mechanism P is preferably mounted on an upper arm 72 of a printing frame 73 which may be constructed and arranged as described in my co-pending application, Serial No. 350,678, filed August 3, 1940, now Patent No. 2,275,439, patented March 10, 1942. Such a printing frame 73 is of generally C-shaped form providing the upper arm 72 joined by an integral vertical connecting portion 74 to a generally parallel and integrally formed lower arm 75. The vertical portion of the printing frame 73 projects through the table top T adjacent the magazine M so that the lower arm 75 extends forwardly and acts as a support for the anvil A (Figs. 26 and 28), while the other or upper arm 72 projects across and in spaced relation to the table top T so as to support the platen mechanism over the anvil A. The C-shaped printing arm 73, as described in my aforesaid co-pending application, Serial No. 350,678, is preferably disposed at an angle to the forward edge 76 of the table top T, thereby to provide a large and advantageously disposed throat which attains clearance for many types of large sheets and forms which have heretofore been difficult of manipulation with respect to printing machines of the type herein shown. The printing arm 73, as described in said co-pending application, Serial No. 350,678, is so constructed and arranged that the impression making forces applied in the course of a printing operation are absorbed entirely within the printing frame, and hence the support for the printing frame 73 is relatively simple. Thus, as shown in Figs. 3, 4, 26, 28 and 30, the forward end of the lower arm 75 has an anvil support 78 formed rigidly thereon so as to rest on a supporting bar 79 which extends between end walls 80 of the main frame 70 adjacent the forward edge 76 thereof. The anvil A is secured to the top of the anvil support 78 by means such as screws 78' shown in Figs. 26 and 30. The rear portion of the printing frame 73 is supported by a bracket 81 (Figs. 2, 4 and 5) which is secured to the vertical portion 74 of the printing frame 73 and rests upon and is bolted to a rear supporting bar 82 which extends between the end walls 80 of the main frame 70 adjacent the rear edge thereof.

The platen mechanism P to which the present invention pertains is of the so-called roller platen type having a platen roller PR carried beneath a carriage C which is supported and guided on the forward end of the upper arm 73 for reciprocatory movement across the printing position defined by the anvil A. In a general sense, such guided support for the carriage C is provided by rollers 89 and 90 mounted on the carriage C so as to engage and ride along tracks 91 provided on a carriage support plate 92. This carriage support plate 92 is adjustably mounted on the lower face of a head forging 94 which forms the forward end of the upper arm 73, such adjustable mounting including means, to be hereinafter described in detail, which is operable by an adjusting knob 95 to vary the printing pressure applied by the platen roller PR in the course of a printing operation.

The tracks 91 are so disposed that the platen carriage C may be reciprocated along a generally horizontal path extending in a direction from front to rear of the machine frame, and in the course of such reciprocation the printing operation is effected as will hereinafter be described in detail. The desired reciprocation or printing cycle of the platen carriage is preferably derived from a constantly rotating main operating shaft 100 mounted in the main frame 70 just forwardly of and parallel to the rear supporting bar 82, there being an actuating eccentric 101 (Fig. 5) loosely mounted on the shaft 100 and adapted to be operatively connected to the shaft 100 by means of a one-revolution clutch 102 (Figs. 2 and 5). The eccentric 101 has a transmitting connecting rod or link 103 operatively associated therewith by means of an embracing bearing 104, and the other end of the link 103 is pivoted to the end of an arm 105 which is fixed on one end of an intermediate shaft 106. This shaft 106 is mounted for rocking movement in a bearing sleeve fixed in and extending through the lower arm 75 parallel to the rear supporting bar 82. The other end of the intermediate shaft 106 is located beneath the table top T adjacent the left-hand lower corner of the magazine M (Fig. 2) and has an arm 109 fixed thereto so as to extend generally rearwardly from the shaft 106, as shown in Fig. 5. A link 110, having one of its ends pivoted to the end of the arm 109, extends upwardly through the table top T and has its other end pivoted to an arm 111 fixed to an upper rock shaft 112 mounted in the upper arm 73. The upper rock shaft 112 is mounted parallel to the shaft 106 in a suitable bearing sleeve 112' fixed rigidly in the upper arm 72 so that the other or left-hand end (Fig. 2) of the rock shaft 112 is disposed generally rearwardly of the platen carriage C. On the left-hand end (Fig. 2) of the upper rock shaft 112, an arm 113 is fixed and connecting means is interposed between the arm 113 and the platen carriage C whereby rocking movement of the shaft 112 operates to move the carriage C through its reciprocating stroke. When such reciprocation is desired, the one-revolution clutch 102 is released, as by means of a release rod 115 and an actuating or control pedal 116 (Fig. 1) so that the clutch 102 operates the eccentric 101 through a single revolution in the course of which the connecting link 103 acts through arm 105 to rock the lower shaft 106, while the arm 109, the link 110 and the connected arm 111 serve to transmit the rocking movement to the upper rock shaft 112. The actuating pedal 116 is also arranged to control the printing device advancing mechanism of the machine, which is described in detail in my co-pending application, Serial No. 388,998, filed April 17, 1941, so as to advance a different printing device D to printing position each time the pedal 116 is actuated.

When the upper shaft 112 and its platen actuating arm 113 are rocked through an operating cycle, a platen carriage C is first moved in a forward direction along the path determined by its supporting and guiding tracks 91, and in the course of this forward movement the platen roller PR is shifted downwardly from its retracted position of Fig. 26 to its operative or lowered position of Fig. 28. This downward shifting movement of the platen roller PR is attained through the medium of toggle means 120 which will hereinafter be described in detail, and when the platen carriage C has reached the forward limit of its movement, the platen roller PR is in its fully lowered or operative position of Fig. 28. Reverse rocking movement of the shaft 112 then operates to move the carriage in a rearward

direction, and during such rearward movement the platen roller PR is maintained in its lowered or operative position and is caused to move with a rolling action transversely across the lines of type of the printing device D which is then at printing position on the anvil A, thereby to press the sheet or form against the inking ribbon and the type to produce the desired printing impression.

The operative connection between the arm 113 and the carriage C is formed by means of a cross bar 122 mounted on the end of the arm 113 so as to project in opposite directions therefrom, and this cross bar 122 transmits the movement of the arm 113 to the platen carriage C through the medium of a pair of connecting links 124 which have their corresponding ends pivotally connected to the carriage C. The connection between the links 124 and the cross bar 122 is such that during the rearward or printing stroke of the carriage C the actuation of the carriage is positive in character, while during the forward or conditioning stroke of the carriage, the actuation of the carriage is yielding in character, thereby to prevent injury to the operator's hands or fingers in the event that they are positioned beneath the platen roller PR during the downward movement of the platen roller. Such actuation is attained by providing a downwardly facing arcuate notch 125 near the rear end of each link 124 so that these notches normally rest in the upper halves of annular guiding grooves 126 formed near the opposite ends of the cross bar 122, as shown in Figs. 4 and 5. The grooves 126, in effect, provide reduced portions on the cross bar 122 with which the arcuate notches 125 are held in yielding engagement by means of springs 127. These springs 127 are of the torsion type, the coils of which surround the cross bar 122, and each spring 127 has arms 128 which are hooked as at 129 over the upper edge of the adjacent link 124 to urge the link downwardly into interlocked relation with the cross bar. When, in forward rocking movement of the arm 113, the platen mechanism encounters an undue resistance such as would be caused by an operator's finger beneath the platen roller, the cross bar 122 acts on the forward sides of the arcuate notches 125 and cams the rear ends of the links 124 upwardly so as to disengage the cross bar 122 from the notches 125. Hence, the cross bar 122 may idle through the balance of its forward stroke, the hooks 129 of the springs 128 sliding at this time along the upper edges of the links 124, and hence further downward actuation of the platen roller PR is prevented. In its return stroke the cross bar 122 is again engaged with the notches 125 so as to be conditioned for the next operation of the mechanism. During normal printing operation, the desired positive rearward actuation of the carriage C is insured by downwardly extending lugs 125' formed on the links 124 just rearwardly of the notches 125. The vertical forward faces of the lugs 125' are, of course, engaged by the cross bar 122 so that the carriage C is positively actuated in its rearward or printing stroke.

Since the present invention has as one of its primary objects the provision of a platen mechanism wherein adjustment of the printing pressure is independent of and does not disturb the adjustment or setting of the line cut-off, the cooperative action of the platen roller with the printing device D in attaining the desired printing action and line cut-off will now be described in detail. Printing devices D of the general character with which platen mechanism of the present invention may be employed are used for the printing of a wide variety of information, and this is true whether the printing device is in the nature of a printing plate with embossed type thereon or is of the stencil type, and since the machine which has been illustrated herein is adapted to employ printing devices having embossed type thereon, the printing devices will herein be described in detail with reference to this particular construction or type of printing device. One embodiment of such a printing device D is illustrated in Fig. 10 of the drawings, and it will be observed that this printing device D has a sheet metal frame 130 having a printing plate 131 releasably mounted thereon by means of a curled edge 132 and engaging lugs 133, this printing plate 131 being held in the desired longitudinal position on the frame 130 by means of yieldable spring lock devices 134. Along the upper edge of the same face of the frame 130, an index card 135 is positioned by means of suitable overhanging lugs 136 and a curled edge 136' formed on the frame 130. This index card 135 has a printing impression formed thereon as at 137 which may include impressions from all or any part of the type characters which are formed on the printing plate 131.

The type characters are formed on the printing plate 131 in a plurality of lines which extend parallel to the longitudinal edge of the printing plate and frame, and for convenience of description these several lines of type will in most instances herein be described and located with reference to the lower edge of the printing plate, since in the printing machine herein disclosed, the printing operation of the several lines of type progresses transversely across the lines of type from the lower edge toward the upper edge of the printing plate. The type characters upon the printing plate 131 may represent many different classes of data or information, depending in a large measure upon the type of business in which the printing machine and the printing devices are being used. One such class of information may include the name of a person, which is usually formed in the upper line of type 140, the street address which is usually formed in the next line 141 of type, the city and state of the address which is usually represented in the next line 142 of type, and a personalized salutation, which is usually formed in the lower line 143 of type, which is in accordance with the standard form of preparing or writing business letters is spaced an extra distance of one line from the line 142.

With the arrangement of type characters in the lines illustrated in Fig. 10, the printing device D may be employed for the addressing of envelopes or the preparation of other forms wherein it is desired to print only the name, street address and city and state, and it may also be employed in printing the full name and address as well as the personalized salutation in the desired relation to the previously printed body portion of a letter, such for example, as the letter 144 which is shown in a fragmentary sense in Fig. 14 of the drawings. Such use of the printing device D, to print different portions of the data represented by type characters on the printing plate 131, requires that provision must be made for cutting off certain portions of the type characters during certain of the printing operations, the particular instance above described being such that during the addressing of an envelope the personalized

salutation carried on the printing plate in line 143 must be cut off or prevented from making a printing impression. In the trade this variation in the extent of the impression which is made from a printing device is known as "variation or adjustment of the line cut-off." In the printing machine disclosed herein, the platen roller PR in its operative or printing movement rolls against the sheet S in a rearward direction so that the bottom line or line 143 of the printing device is first printed, and the lines of type are successively printed toward the top of the printing device so that the line 141 is the last line to be printed in a printing operation. Thus the adjustment or setting of the platen mechanism to vary initial operation of the platen roller in a printing operation, so as to cut off or prevent printing of one or more of the lower lines of type, may be termed the adjustment or setting of the initial line cut-off, while the variation or setting of the platen mechanism to adjust or determine the printing action thereof in the latter portion of the printing operation, so as to cut off or prevent printing of one or more of the upper lines of type, may be termed the adjustment or setting of the terminal line cut-off. The manner in which the initial line cut-off is attained in the present machine is illustrated in Figs. 11 and 12 of the drawings in which a printing device D, having the lines of type carriers arranged as shown in Fig. 10, is shown for purposes of illustration. Thus in Fig. 11 of the drawings, the platen mechanism is so adjusted and arranged that the name and address data as well as the personalized salutation provided by the line 143 of type are printed in a single printing operation with the result that a personalized letter 144 such as that shown in Fig. 14 may be produced. In contrast to the initial line cut-off provided in the platen roller of Fig. 11 of the drawings, the platen roller PR shown in Fig. 12 of the drawings is so adjusted and arranged that in a printing operation merely the name and address data carried on the printing device D will be printed, and as a result the platen mechanism as illustrated in Fig. 12 of the drawings may be employed where it is desired to print only the name and address data to the exclusion of the personalized salutation provided by the line 143 of type on the printing device. Hence the platen shown in Fig. 12 which is so adjusted as to print only the name and address data may be employed to print this name and address data on an envelope 145 as shown in Fig. 15 of the drawings.

The construction and operation of the platen mechanism of Figs. 1 to 43 is such that when the platen roller is in its most forward position and is conditioned for the rearward or operative printing stroke, a particular point on the circumference of the platen roller PR is located directly beneath the axis of the platen roller, and for illustrative purposes this point on the circumference of the platen roller is indicated by an index mark which is identified as X—1 in Figs. 11 to 13. In the return or rearward movement of the platen mechanism or platen carriage C, the platen roller moves with a rolling action so as to rotate in a counterclockwise direction about its rotative axis, and hence the portion or sector of the platen roller PR which is located in a clockwise direction from the index mark X—1 may be said to constitute an operative platen sector or face. The platen PR is of such a diameter that where the number of lines of type to be printed in a single printing operation is relatively small, a plurality of such sectors may be provided on a single platen roller. In the embodiment of the invention which is illustrated in Figs. 1 to 43 hereof, only one of these operative sectors of the platen is employed, but in certain applications of the mechanism illustrated in Figs. 1 and 43, as for example, in the two alternative embodiments which will hereinafter be described, the plurality of faces or sectors of the platen are utilized in effecting a wider and more advantageous use of the present platen mechanism. In Fig. 11 an index point X—2 has therefore been indicated as being disposed 180° about the platen roller PR, this index mark defining the initial edge of a second platen sector in the same sense as the index point X—1.

Having in mind that the rotative or rolling movement of the platen roller PR is governed and is positive in character, it will be evident that particular portions of the periphery of the platen will, in the operative printing stroke of the platen roller, move into an operative relation with particular portions or lines of the printing device, and this characteristic is employed in adjusting or setting the initial line cut-off and is employed in most instances in determining at least in part the terminal line cut-off which is to be effected.

The platen roller PR in effecting the desired printing cooperation between the sheet S, the ribbon R and the printing device D must apply the requisite force to the reverse or back side of the sheet S through a resilient medium, and this resilient medium is mounted directly upon the platen roller PR in the form of a resilient sheathing which may be made of rubber or some other suitable resilient material. This sheathing is ordinarily applied as a continuous tubular coating about the periphery of the platen roller PR, and is then cut away to provide one or more individual platen faces PF which by their form, extent and positioning during the rolling movement of the platen roller PR, determine the line cut-off which is to be attained with the particular platen face. Thus as shown in Fig. 11, the resilient sheathing is cut away for a short distance to the left from the index point X—1 along a plane or surface 146 so that the edge thus formed meets the outer peripheral surface of the sheathing along a line 147 which is so located that in the rearward rolling movement of the platen PR from its initial operative position of Figs. 11 and 28, this edge or line 147 will contact the back side of the sheet S slightly to the right or forwardly of the first line of type which is to be printed. As shown in Fig. 11 of the drawings, where the platen face PF is intended to cause a printing impression to be formed from the line 143 of type which constitutes the salutation, the edge 147 is formed relatively close to the index point X—1, while in Fig. 12 of the drawings wherein the platen roller PR is intended to cut off or avoid printing of the personalized salutation, the corresponding edge, which is there numbered 147', is formed considerably to the left or in a clockwise direction from the index point X—1. Thus the platen faces illustrated in Figs. 11 and 12 will produce different initial line cut-off operation. The two arrangements of the platen shown in Figs. 11 and 12 are intended to print entirely across the printing device from the point or line determined by their initial line cut-off formation, so that in each instance the platen

face is determined by an edge 148 which in these two figures is located the same angular distance in a clockwise direction from the index point X—1.

In Fig. 13 of the drawings there is illustrated a platen roller PR wherein the initial line cut-off formation of the platen face is the same as the initial line cut-off formation shown in Fig. 11, but the formation of the platen face in this figure is terminated in a plane indicated at 148' so that the final or terminal line cut-off prevents printing of the last two lines of the type characters on the printing device D. It should be noted that the printing device D which is shown in Fig. 13 of the drawings is formed somewhat differently from the printing device shown in Figs. 10 to 12, this different arrangement of the type on the printing device shown in Fig. 13 being such that type characters are included in all of the possible lines of the printing plate. Such a formation might be employed, for example, in tax work, wherein the upper two lines might represent the name and address of a property holder, while the lower three lines, that is, the right-hand lines in Fig. 13, would constitute a description of the property owned by that person. In the preparation of a tax roll from a printing device of this general character, it is customary to print the name and address of the property owner in a left-hand column and to print the description of the property in another more right-hand column, and the platen face shown in Fig. 13 of the drawings is adapted for the printing operation involved in the printing of the description of the property in such a second column. It will be understood, of course, that the other or first printing operation, that is, the printing of the name and address of the property owner, would be accomplished through the formation of a platen face in the same general manner as that illustrated in Fig. 11 of the drawings, the peripheral extent of the platen face being so located and of such an extent as to enter into printing cooperation only with the upper two lines of type.

The printing machine illustrated in the drawings is intended and adapted for simultaneous performance of supplemental or auxiliary printing operations, such for example, as the printing of a number from a consecutive numbering device, the printing of a date, or the printing of a signature in the event that the machine is being employed to prepare documents such as checks requiring such signature. To effect such auxiliary printing operations the platen roller PR is of a length somewhat greater than would be necessary for the performance of the primary printing operations from the devices D, and on this additional length of the platen PR an auxiliary printing face PFS may be formed as shown in Fig. 7 by appropriate cutting and forming of the resilient sheathing of the platen roller. This auxiliary printing face PFS is adapted to cooperate through the inked ribbon R with auxiliary printing means which is located beneath the inked ribbon R to the left of the primary printing position as viewed in Fig. 1 of the drawings. The relation of primary printing position to the auxiliary printing means or printing position may be understood and visualized from Fig. 6 of the drawings, which illustrates a sectional shield 150 which forms part of the table top T. The shield 150 has a first or primary opening 151 formed therein to define the primary printing position over the anvil A and a secondary opening 152 which defines the auxiliary printing position. This shield 150 has a forward section 150' which is adapted to be removed relatively easily to expose the forward end of a slide 155 which is mounted on the anvil support 78 for movement from its normal operative position shown in Fig. 4 to a forward position to the right from the position shown in Fig. 4. When the section 150' of the shield has been removed and the slide 155 has been withdrawn forwardly, an auxiliary printing device 156 may be mounted on the slide. This auxiliary printing device 156 may be an embossed plate bearing type characters representing the date, or it may be a signature plate or a consecutive numbering device as desired. After the mounting of such an auxiliary printing device upon the slide 155, the slide is moved forwardly so as to move the printing device into an operative position beneath the ribbon R, after which the removable section of the shield 150' may be replaced in the position shown in Fig. 6.

As hereinabove pointed out, the intensity of the printing impression may be conveniently adjusted by the operator through manipulation of the adjusting handle 95, the manipulation of this adjusting handle being such as to vary the vertical positioning of the platen roller PR. This vertical adjustment of the platen roller PR serves to vary the degree to which the resilient sheathing which forms the platen face PF is compressed during a printing operation, and as a result the intensity or shading of the printing impression is correspondingly varied. While such adjustment of the intensity of the printing impression has heretofore been possible, such adjustment in printing machines employing the geared roller type of platen mechanism has resulted in undesired changing or variation of the initial rotative position of the platen roller PR, and as a consequence the line cut-off operation of the accurately formed and initially accurately positioned platen face has been disturbed, and this change or disturbance in the cut-off operation of the platen face has extended or applied to both the initial and the terminal line cut-off operation thereof.

In accordance with the present invention, the platen mechanism is so constructed and arranged that the adjustment of the printing pressure to be applied by the platen roller is independent in every sense of the line cut-off adjustment or setting of the platen mechanism, and with the novel construction and arrangement provided by the present invention, the operator may accurately and conveniently adjust the printing pressure so as to produce the desired matched impressions. This matching of impressions may be readily accomplished, and even where the run is to be relatively short, this matching or adjustment may be economically performed. The platen mechanism of the present invention is also such that the adjustment of the platen mechanism as to its point of withdrawal of the platen roller away from the sheet S may be easily and accurately performed.

In attaining these desirable characteristics, the platen roller PR is mounted for levelling adjustment as well as vertical adjustment to vary the printing pressure and these adjustments are in accordance with the present invention attained through the medium of the platen supporting plate 92. The supporting plate 92 is preferably formed as shown in detail in Fig. 31 and comprises generally a hollow square in horizontal

cross section. The supporting plate 92 has two relatively heavy side rails 160 connected at one end by a relatively heavy end rail 161 and at the other end by a relatively light brace or strut 162. The tracks 91 are formed separately from the support plate 92, and each track 91 comprises an elongated rectangular plate or strip. One of the tracks 91 is secured along the bottom of each of the side rails 160, the outer edge of each plate extending outwardly somewhat from the edge of the side rail 160 for operative engagement with a flange 90' formed on the outer edge of each of the rollers 90 as shown in Figs. 30 and 36, it being understood that there are two such rollers 90 spaced apart longitudinally of the carriage C so as to engage the under surface of each track 91 at points spaced longitudinally of the track. The other or inner edge of each track 91 projects inwardly from the rail 160 upon which it is mounted to provide an upwardly facing surface 91' (Fig. 31) which is engaged by the associated roller 89 mounted on the carriage C. Each roller 89 engages the track 91 intermediate the spaced points at which the associated two rollers 90 engage the lower face of the track.

The support plate 92 is mounted beneath a web 165 of the head forging 94 by means which permits levelling of the support plate 92 as well as actuation of the printing pressure adjusting knob 95 to effect vertical adjustment of the platen roller PR. To this end the support plate 92 is carried on the web 165 by means which tends yieldingly to move the support plate 92 in an upward direction, and this yieldingly induced upward movement of the support plate 92 is controlled by means through the medium of which the support plate may be levelled as well as adjusted in a vertical direction. The means for urging the support plate yieldingly in an upward direction preferably comprises a pair of bolts or studs 166 having their lower ends threaded into apertures 167 formed in the upper surface of the side rails 162 of the support plate, there being one such aperture 167 in each of the side rails 160 substantially midway between the ends thereof. As shown in Fig. 34 of the drawings, each stud 166 extends upwardly through the web 165 and into a counterbore or pocket in which an expansive coil spring 168 is mounted. Above its coil spring each stud 166 has a pair of nuts 169 which are tightened downwardly on the stud 166 so as to place the associated spring 168 under compression.

The resilient force of the two springs 168 acts, therefore, through the studs 166 to urge the support plate in an upward direction or toward the lower face of the web 165, and means is associated with the web 165 for controlling this upward urging movement in such a manner that the support plate may be readily levelled, and after being so levelled, may be adjusted relatively gradually or in relatively fine increments in a vertical direction. In providing for such levelling and vertical adjustment, three levelling screws 170 are provided which determine the extent to which the support plate may be drawn upwardly by the resilient supporting means. These levelling screws 170 are disposed at widely separated points so as to extend slidably or in an unthreaded relation through vertical bores 171 (Fig. 26) formed in the web 165. The levelling screws 170 extend entirely through the web 165 and the reduced lower end of each levelling screw is seated in a bore or socket 172 formed in an appropriate location in the upper face of the support plate 92. As shown in Fig. 31, one of these sockets 172 is formed in the upper surface of the cross rail 161, while another one of the sockets 172 is formed in each of the side rails 160 adjacent the opposite or forward end thereof.

Upward movement of the levelling screws 170 is governed or limited by nuts 175, one of these nuts being provided on each of the levelling screws 170 immediately beneath the lower face of the web 165. Preferably these nuts 175 are formed on their peripheral surfaces as pinions and the three pinions thus provided are engaged or meshed with a common central gear 176 which is mounted on the lower surface of the web 165 by means of a bolt or pivot pin 177. This pivot pin 177 extends entirely through the web 165 so that its upper end 178 may serve as a positioning or locating means for a cover 179 which is removably positioned on the top of the web 165 to form a decorative continuation of the surface of the arm 72 over the top of the head forging 94. This positioning function of the upper end 178 of the pin 177 is attained by means of a downwardly facing socket 180 formed in the lower face of the cover 179. It will be evident that by rotation of the central gear 176, all of the nuts 175 may be rotated in unison with respect to their screws 170 so that the vertical position of the support plate 92 may be varied, and the central gear 176 is thus rotated and is maintained in its desired adjusted position by means associated with and actuated by the adjusting knob 95. As shown in Figs. 35 and 36 of the drawings, the adjusting knob 95 has a shaft 190 fixed through which projects through a downwardly extending skirt portion 191 of the head forging relatively close to the adjacent nut 175, and on its inner end the shaft 190 has a worm 192 which engages or meshes with one side of said adjacent pinion 175. In order that the worm 192 may have an appropriate engagement with the external teeth 175' of the nut 175, these teeth 175' are slightly helical in their form, and all of the other teeth 175' on the other nuts 175, as well as the teeth of the central gear 176, are correspondingly formed.

As shown in Fig. 36 of the drawings, the shaft 190 has an annular groove 195 formed therein within its bearing in the skirt portion 191, and a spring plunger 196 is mounted in the web 165 so as to engage the annular groove 195 and maintain the shaft 190 in the desired endwise position. The plunger 196 is urged into engagement with the bottom of the groove 195 by means of a spring 197 which surrounds the reduced upper end of the plunger 196, and an adjusting spring and nut arrangement 198 is provided in abutment with the upper end of the spring 197 so that the force with which the plunger 196 engages the shaft 190 may be varied. This adjusting spring and nut arrangement 198 is accessible for manipulation on the upper side of the web 165 as shown in Fig. 9 when the cover 179 is removed. The worm 192 tends, of course, to provide a one-way actuating drive for the gears 175 and their connecting central gear 176 so that when the vertical position of the support plate 92 has been adjusted by means of the adjusting knob 95, the desired adjusted position will be maintained, even though a relatively great upward force may be applied through the adjusting screws 170 and the gearing 175 and 176 to the worm 192. While the self-locking action of the worm 192 may in many instances be sufficient to maintain the desired adjustment of the vertical position of the sup-

port plate 92, I prefer to provide the spring plunger arrangement 196 which by its frictional engagement with the shaft 190 serves to augment the self-locking action of the worm 192 and thereby insure against disturbance of the vertical adjustment of the support plate 192.

The foregoing operation of the vertical adjustment means which is operated by the adjusting knob 95 is predicated upon the maintenance of the several levelling screws 170 in a fixed rotative position during such adjustment so that the several nuts 175 may be rotated in equal amounts with respect to their associated levelling screws 170. In the present instance, this locked rotative positioning of the several levelling screws 170 is effected by means which may be readily released in order that the levelling screws 170 may be individually rotated or adjusted with reference to their associated nuts 175, thereby to permit levelling of the support plate 92. For this purpose the upper end portion of each levelling screw 170 has a non-circular portion 210 (Figs. 9 and 28) formed throughout a considerable portion of its length, this non-circular portion 210 being formed in the present instance by flattening of opposite sides of the levelling screw 170. About the non-circular portion 210 of each levelling screw 170 a securing washer 211 is mounted, each securing washer 211 having a central opening therein which is complemental to the form of the non-circular portion 210. Hence, the securing washer 211 may move along the non-circular portion 210 longitudinally of the levelling screw 170 but when the levelling screw 170 is rotated as by engagement of a screw driver with a kerf 212 formed in the projecting upper end of the levelling screw, the securing washer 211 will be rotated with the levelling screw. When such rotative adjusting movement is imparted to any one or more of the levelling screws 170, it will be understood that the associated nut 175 will be held against rotation by the self-locking action of the worm 192 as well as by the restraining action of the spring plunger arrangement 196, 198, and hence the rotative adjustment of any one of the levelling screws 170 will have the desired levelling effect upon the support plate 92. After the support plate 92 has, by manipulation of the levelling screws 170, been levelled, this desired levelled position is maintained by securing all of the levelling screws 170 in the rotative positions determined by the levelling operation. Such locking of the several levelling screws 170 is preferably effected by means of a plurality of locking washers 214, one of which is provided in overlying relation to the edge of each of the positioning or securing washers 211, and a central locking screw 215 is provided which extends through each of the locking washers 214 and is threaded into the upper face of the web 165. By tightening of its locking screw 215, each of the locking washers 214 may be clamped downwardly upon the associated positioning washer 211. It will be observed that although the locked positioning washers 211 serve to prevent rotative movement of their associated levelling screws 170, the levelling screws may move in a vertical direction in the event that the nuts 175 are actuated by the adjusting knob 95.

The carriage C is mounted beneath the support plate 92 by means of the rollers 89 and 90 which engage the tracks 91 of the support plate and this mounting is such that the positioning and the path of movement of the carriage C are vertically adjusted as well as levelled as an incident to the vertical adjustment and levelling of the support plate 92. The carriage C is preferably of a relatively hollow formation so as to house portions of the platen operating and controlling mechanism, and to this end the carriage C comprises an elongated hollow member which may be described as being of an inverted trough-like form, which opens downwardly for the purpose of housing certain of the operative parts of the platen mechanism, and which has a top wall 220 through which the mounting of the carriage on the guide tracks 91 is effected. The carriage C is best shown in Figs. 16, 18, 26 and 28 wherein it will be evident that the top wall 220 is convexed slightly upwardly, as viewed in transverse cross section, and rear and front walls 221 and 222 are formed so as to depend from the rear and front edges respectively of the top wall 220. End walls 223 and 224 are also formed so as to depend from the ends of the top wall 220 and these end walls 223 and 224 serve to connect the rear and front walls 221 and 222.

The guide rollers 89 and 90 are mounted on the top wall 220 of the carriage C, there being a plurality of bearing means or lugs formed on and projecting in a generally upward direction from the top wall 220 of the carriage. Thus, as seen in Fig. 16 of the drawings, a pair of spaced lugs 225 are formed on the upper face of the top wall 220 to serve as the supporting means for each of the two forward guide rollers 90, and a pin 226 is provided for each of the pairs of lugs 225, the pin extending through suitable bores in the lugs 225 so as to project through and form a bearing shaft for its roller 90.

A pair of similarly spaced bearing lugs 227 is provided for supporting each of the two rear guide rollers 90, these lugs 227 being connected in part to the top wall 220 and in part to the rear face of the rear wall 221, and these lugs extend rearwardly a substantial distance from the rear wall 221 so as to space the rear roller 90 a considerable distance from the corresponding front roller 90. Similar bearing pins 228 extend between each air of lugs 227 and through the associated rear guide roller 90 thereby to provide a bearing for the associated roller 90.

The rollers 89 are supported by means of bearing lugs 230 which project upwardly from the top wall 220 in spaced relation to the line which may be said to connect the two rollers 90 which are to cooperate with the same guide track 91. A stud 231 is mounted in each bearing lug 230 so as to extend in a direction generally toward the line which connects the associated pair of rollers 90, and the roller 89 is mounted on this bearing stud 231 so as to be rotatable thereon. Each mounting stud 231 is held in position by a nut 232. When the carriage is to be mounted in position on the guide tracks 91, the carriage is moved rearwardly or toward the front edge of the support plate 92 and, as will be evident in Figs. 26 and 31, the cross bar or strut 162 is positioned in an upwardly spaced relation with respect to the upper surface 91' of the tracks so that the rollers 89 may be moved rearwardly through the space thus provided and into operative relation with the upper bearing surface 91' of the tracks.

The actuating links 124 are also connected at their forward ends to the outside or rear side of the carriage C by lug means formed on the carriage. Thus, as shown in Fig. 16 of the drawings, a pair of spaced lugs 235 is formed on the

rear wall 221 of the carriage for connection with each of the actuating links 124. Each of these pairs of lugs 235 may, as herein shown, be formed integrally with one of the lugs 227. To connect each link 124 to its pair of lugs 235, a pivot pin 236 extends between the two lugs of each pair through suitable apertures, this pin 236 in each instance extending through an aperture formed in the forward end of the link 124 so that the forward end of the link 124 extends between its pair of lugs 235 and is pivoted thereto by means of its pin 236.

As shown in Figs. 18, 26, 28 and 30, the toggle means 120 is pivoted at its upper end within the downwardly opening enclosure or recess provided by the carriage C, such pivotal mounting being provided by a shaft 240 which is rotatably mounted in suitable bearings 241 formed in the end walls 223 and 224 of the carriage. The toggle means 120 in the present instance comprises two toggles, one located adjacent each end of the housed portion of the shaft 240, each toggle comprising an upper toggle member or link 242 and a lower toggle member or link 243, the upper and lower toggle members 242 and 243 being pivoted together by means of a central pivot shaft 244. The upper toggle links 242 are fixed to the supporting shaft 240 so as to project therefrom in the same direction and to be rotated about the axis of the shaft 240 in unison. The lower ends of the upper toggle links 242 are bifurcated or slotted as at 245 in a plane perpendicular to the axis of the shaft 240, and the upper ends of the lower toggle links 243 extend into these slots 245 so that the pivot shaft 244 may extend through the upper toggle link 242 and each slot 245 to form the desired pivotal connection between the upper and lower toggle links. As shown in Figs. 18 and 30, the pivotal connections between the toggle links of both of the toggles are provided by a single shaft 244 which extends between the two toggles to render the same more rigid and more accurately operable in unison, this shaft 244 also being employed in the actuation and control of the extension or retraction of the toggles, as will be hereinafter more fully explained.

The lower ends of the lower toggle links 243 are employed to provide the requisite mounting for the platen roller PR, and since it is desired to have the platen roller positioned in a predetermined relation to the platen carriage C and the anvil A prior to and during the operative printing stroke of the platen roller, means is provided to guide the lower ends of the toggles as the toggles are extended and retracted. In the present instance this guide means comprises a pair of links 250 and 251, one of which is associated with each of the two toggles. As shown in Fig. 19, the guide link 250 has one end pivotally associated with the lower end of the lower toggle links 243, this particular toggle link 243 being the one which is located at the left-hand end of the carriage C, as viewed in Figs. 1, 8, 27 and 30. Such pivotal association is provided by a pair of interlocked concentric sleeves 252 and 253 which project through an opening 254 in the guide link 250. The sleeve 252 has a flange 255 which engages the right-hand or inner face of the toggle link 243, as viewed in Fig. 19, while the sleeve 253 has a flange 256 which engages the outer or left-hand face of the guide link 250, as viewed in Fig. 19. The other end of the guide link 250 is pivotally connected to a lug 257 which projects rearwardly from the rear wall 221 of the carriage C, as shown in Fig. 16, there being a pivot pin 258 which provides a pivotal connection between the guide pin 250 and the lug 257. The other guide link 251 has one end pivoted by means of a pivot pin 260 to a lug 261 which projects rearwardly from the rear wall 221 of the carriage adjacent the other or right-hand end of the carriage. The form and location of the lug 261 is best shown in Fig. 7 of the drawings, but since Fig. 7 is a rear view of the platen mechanism, the lug 261 appears in this view on the left-hand side of the view. It will be observed that the pivot pins 258 and 260 for the two guide links 250 and 251, respectively, are coaxial so that the up and down movement of the lower ends of the two lower toggle links 243 are guided in a similar and uniform manner, it being noted that the other end of the guide link 251 is pivoted to the lower end of its lower toggle link 243 upon an axis which corresponds or is aligned with the axis of the pivotal opening 254 of the toggle 250.

Since the rotative positioning and the rolling action of the platen roller PR must be accurately controlled in the course of a printing operation, gearing means is provided to impart such actuation and control to the platen roller, and this gearing means is mounted in part upon the guide link 251. The terminal member of this gearing means is, in the present instance, mounted upon the means which provides the pivotal connection between the toggle link 243 and the guide link 251, as is best shown in Fig. 19 of the drawings. The terminal element of the gearing means in the present instance comprises a pinion 265 having a central bore through which a sleeve 266 extends. This sleeve 266 has a flange 267 at its left-hand end, as viewed in Fig. 19, so as to hold the pinion 265 against movement to the left. The sleeve 266 extends through an opening 268 formed in the lower end of the toggle link 243 and into an opening 269 formed in the other end of the guide link 251. The sleeve 266 is held in this relation to the pinion 265, the link 243 and the link 251, by another sleeve 270 which projects inside of the sleeve 266 and is interlocked or secured thereto, the sleeve 270 having an annular flange 271 which engages the outer or right-hand face of the guide link 251, as viewed in Fig. 19.

When a platen roller PR is to be mounted in position between the lower ends of the two toggles, the platen roller PR is positioned between the two toggles in axial alignment with the bearing openings provided by the two sleeves 252 and 270 and a supporting or mounting pin 280 is inserted through the two bearing sleeves and through the central opening of the platen roller. In this connection it should be observed that the platen roller PR is preferably formed as a hollow sleeve-like member as shown in Figs. 19, 20, 21, 22 and 24 and suitable roller bearings 281 and 282 are provided internally within the opposite ends of the sleeve-like platen member for bearing engagement upon the mounting pin 280. As shown in Fig. 19, the left-hand roller bearing 281 comprises a mounting sleeve 283 fixed in a counterbored relation within the left-hand end of the platen roller PR and having a plurality of roller bearing elements 284 mounted therein in proper positions for bearing engagement with the mounting pin 280.

The other roller bearing 282 is of a somewhat different form as will be seen in Figs. 19, 20, 21

and 24, since a portion of this roller bearing member 282 is utilized to provide a rotatively interlocked connection of the platen roller PR with the pinion 265. Thus, as shown in Fig. 24, the roller bearing 282 has a sleeve-like carrier member 285 set in a counterbored relation within the right-hand end of the platen roller PR and is provided with a plurality of roller bearing elements 286 adapted to engage and run upon the periphery of the mounting pin 280. The sleeve-like mounting element 285, however, has a portion of its right-hand end arranged as at 287 to project beyond the end of the platen roller PR for the purpose of interlocking the platen roller PR rotatively with respect to the pinion 265. This portion 287 comprises, in effect, an interlocking member or tooth which in the present instance extends throughout 180° with respect to the axis of the platen roller PR, and to cooperate with this interlocking member 287 on the platen roller PR, the pinion 265 has an arcuate axial flange or interlocking member 288 which also extends throughout 180° with respect to the axis of the pinion 265. Thus, when a platen roller PR is being associated with the pinion 265, this association can be effected in but one rotative relationship, and as a result an operator will invariably mount the platen roller in the proper position and relationship to attain the line cut-off action for which the particular platen roller has been prepared.

When the mounting pin 280 is inserted through the bearing sleeve 252 from the left in Fig. 19 and is moved on through the platen roller so as to engage the two bearings 281 and 282 and extend into the right-hand bearing sleeve 270, the mounting pin 280 is held in position by releasable latch means. This latch means is shown in Figs. 19, 22 and 25 and in the present instance comprises an embracing spring clip 295 which surrounds the end of the sleeve 270 which projects to the right of the flange 271. The flange 271 has an annular groove 296 formed in its outer surface into which the spring clip 295 is fitted, and at one point in the periphery of the sleeve 270 the annular groove 296 is deepened as shown in Fig. 25 to provide a slot 297 through which a flattened portion 298 of the spring clip 295 may extend into interlocking relation with an annular latching groove 299 formed in the surface of the mounting pin 280. The right-hand end of the mounting pin 280 is tapered as at 300 so that when the mounting pin 280 is being shifted to the right into its operative position, the tapered surface 300 engages the flattened portion 298 of the spring clip so as to spread or expand the clip and permit further movement of the mounting pin 280 to the right until the latching groove 299 is registered with the flattened portion 298 of the spring clip. At this time the flattened portion of the spring clip 295 snaps into the groove 299 to latch the mounting pin 280 in the desired longitudinal position. The ends of the spring clip 295 are normally positioned in a crossed relationship, as shown in Fig. 25, to provide opposed finger pieces 301 which may be engaged by an operator between the finger and thumb so as to release the spring clip 295 from its latched relation to the mounting pin when the operator desires to remove the mounting pin.

As has been hereinabove pointed out, the platen roller PR is caused to rotate or roll against the back side of the sheet S in the course of a printing operation, and such rotational movement is timed with relation to the reciprocatory movement of the platen carriage and the platen along the supporting tracks 91. This rotative or rolling movement is imparted to the platen roller PR by gearing means, the terminal element of which is provided by the pinion 265, and certain other elements of which are mounted along the guide link 251. Thus, as shown in Figs. 18 and 19, the gearing means includes a pinion 305 mounted on the pivot pin 260 which supports the upper or rear end of the guide link 251, this pinion 305 being interposed about the pivot pin 260 between the guide link 251 and the bearing lug 261. Between the two pinions 265 and 305, an idler pinion 306 is mounted on the guide link 251 by means of a bearing stud 307, the arrangement being such that the idler pinion 306 is in meshed engagement with the two pinions 265 and 305. The pinion 305 is meshed with and driven by a somewhat larger pinion 310 (Figs. 7 and 32) which forms one element of a cluster gear having a second gear or pinion 311 spaced from the pinion 310 by a sleeve 312 having connecting pins 313 extending through suitable bores therein so as to connect the two pinions 310 and 311 of the cluster gear together in axially spaced concentric relationship. As shown in Figs. 7 and 32, the cluster gear is mounted upon the pivot pin 236 which serves to pivot one of the actuating links 124 to the associated lugs 235 on the platen carriage. In Figs. 7 and 32, the cluster gear is located at the left-hand sides of these views, since these two views are taken so as to look forward toward the rear of the platen mechanism. As seen in certain of the other views, as for example, Figs. 8, 27 and 30, the cluster gear is located at the right-hand side of the platen structure. The pivot pin 236 upon which the cluster gear is mounted is, of course, supported by its two bearing lugs 235, and in addition, the remote end of the pin 236 is supported by a bearing arm 315 (Fig. 27) which constitutes a rearward continuation of the right-hand end wall 224 of the platen carriage C.

In the course of the reciprocation of the platen carriage C, rotative movement is imparted to the gear 311 in timed relation to such reciprocating movement of the carriage. In the present instance this rotating movement is imparted to the gear 311 through the medium of a rack 320 located so as to extend substantially parallel to the path of movement of the carriage C and arranged or meshed with the upper edge of the gear 311, as shown in Figs. 26, 27, 28, 32 and 34. The rack 320 is held against longitudinal movement, so that as the carriage C and the gear 310 which is mounted on and moved with the carriage are reciprocated, the gear 311 must roll along and in meshed relationship with the rack teeth 321 formed on the lower edge of the rack 320. Hence rotative movement is imparted to the platen roller PR and this rotative movement takes place in timed relation to the longitudinal or reciprocating movement of the carriage C.

In the present instance, the characteristics of the mounting of the rack 320 and its manner of association with the gear train cooperate in attaining the desired independence of the printing pressure adjustment with respect to the adjustment or setting of the line cut-off. This desired functioning of the rack and gearing means is attained by so mounting and relating the rack 320 to the gearing means that when the carriage C is moved vertically in response to an adjustment of the printing pressure, the operative rela-

tionship between the rack and the pinion which is meshed therewith is undisturbed, which is to say, the vertical adjustment movement which produces vertical displacement of the gear 311 is attained in such a manner that the rack 320 and the gear 311 are maintained in the same relationship during the course of such printing pressure adjustment. In the present instance this result is attained by pivoting the rear end of the rack 320 upon a pivot pin 322 which is located a substantial distance rearwardly of the most rearward point of engagement of the rack 320 with the gear 311, so that when the gear 311 is moved in a vertical direction in the course of adjustment of the printing pressure, the rack 320 at its point of engagement with the gear 311 will rest upon and ride up and down with the gear 311, thereby to retain the same engaged relationship at all points of adjustment of the printing pressure. It will be recognized, of course, that the amount of vertical adjustment of the platen mechanism required in normal adjustment of the printing pressure is relatively small, so that within this normal range of adjustment the arrangement and proportioning of the parts herein shown preserves the same relationship of the elements of the gear train and prevents disturbance of the line cut-off adjustment. In the present instance, the pivot pin 322 is connected to a stationary bracket 323 which is mounted within a triangular housing 324 which extends over the bearing tube 112' as shown in Figs. 2 and 6, the manner of mounting of the bracket 323 being illustrated in Fig. 23 of the drawings.

In order that the rack 320 may be properly positioned and guided in engagement with the upper surface gear 311, a guide plate 325 is mounted in surrounding relationship to the pivot pin 236 between the gear 311 and the bearing arm 315. Since the guide plate 325 is stationary while the gear 311 rotates, a bearing disc 326 is preferably interposed between the gear 311 and the guide plate 325. At its upper edge the guide plate 325 is bent as at 327 to form a hook-like guideway extending over the top and down the opposite side of the rack 320, as shown in Fig. 32. The guideway 327, therefore, acts to maintain the rack 320 in the proper lateral relationship with respect to the gear 311, and also acts to hold the rack downwardly against and in meshed relationship with the gear 311.

The toggle mechanism 120, which supports the platen roller PR and determines the vertical position thereof, is normally urged toward a folded or retracted position shown in Fig. 26, and in the course of forward movement of the carriage C, the toggle mechanism is shifted to the extended or straightened relationship of Fig. 28 so as to position the axis of the platen roller PR relatively close to the sheet S, as illustrated in Figs. 11 and 12 of the drawings. As the platen roller PR is shifted downwardly from the position of Fig. 26 to the position of Fig. 28, the forward movement of the carriage C causes the gearing mechanism to rotate the platen roller PR and as a result of this timed relation, the platen roller, when it reaches its forward lowered position of Fig. 28, is in the predetermined rotative position necessary to attain the desired line cut-off. In other words, the platen roller PR is at this time in the position described with relation to Figs. 11 to 13, and in this position the platen face PF thereof, which is to be effective in the printing operation, is located in a predetermined relation to the anvil and the printing device D carried thereon and will, in its operative or rearward stroke, effect the desired printing operation only as to the lines of type which have been selected by the form and positioning of the platen face.

During the return or operative printing stroke of the carriage C in a rearward direction, the toggle mechanism 120 is maintained in the extended relation shown in Fig. 28 so that the platen roller PR, as it is driven by the gearing mechanism, moves into operative engagement with the sheet S, and in this operative engagement the platen face PF moves in a predetermined manner such that it cooperates with the proper or selected lines of type so as to produce printing impressions therefrom. Upon the completion of the printing of the last selected line of type, the toggles are broken, that is, shifted from their extended relationship, and are retracted to their folded relationship of Fig. 26 wherein the platen roller is located in a retracted relation with respect to the table top T.

The yielding force which normally urges the toggle mechanism toward the folded or retracted relationship of Fig. 26 is preferably associated with the shaft 240 upon which the upper links 242 of the toggles are fixed. As shown in Figs. 18 and 30, the shaft 240 is supported not only in the two end walls 223 and 224 of the carriage C, but is also supported by a plurality of bearing lugs 340, 341 and 342 which depend from the lower or inner surface of the top wall 220 of the carriage C and are located in longitudinally spaced relation along the shaft 240. The bearing lug 340 is disposed so that the left-hand upper toggle link 242 is disposed between said bearing lug 340 and the end wall 223. The bearing lug 342 is disposed relatively close to the other end wall 224 of the carriage C so that the right-hand upper toggle link 242 is disposed between the bearing lug 342 and the right-hand end wall 224. As herein shown, the other bearing lug 341 is located substantially beneath the left-hand guide roller 89 so that a substantial space is provided about the shaft 240 between the lugs 341 and 342. In this space a coiled torsion spring 345 is mounted in surrounding relation to the shaft 240 and one end of the torsion spring 345 is anchored as at 346 in the bearing lug 342. The other end of the torsion spring 345 is anchored as at 347 in a collar 348 which is rotatable upon the shaft 240 and the torsional action of the spring 345 is transmitted to the shaft 240 by means of complemental one-way-drive clutch teeth 349 formed on the opposed faces of the collar 348 and a collar 350 which is pinned as at 351 to the shaft 240. The one-way-drive clutch teeth 349 are so disposed that the torsion spring 345 may act yieldingly to impart rocking movement to the shaft 240 in a counterclockwise direction, as viewed in Fig. 26, such spring-induced rotational movement of the shaft 240 being operable normally to urge the toggle mechanism to the retracted position of Fig. 26. In order that the torsional stress or effect of the spring 345 may be readily adjusted, the collar 348 has a plurality of radial bores 355 formed therein which may be engaged by a suitable adjusting pin to rotate the collar 348 relative to the collar 350. In order to attain such tightening or tensioning in the spring, as viewed in Fig. 30, the adjusting pin is inserted in the adjacent or forward bore 355 and the projecting end of the adjusting pin is moved downwardly so that the engaged teeth 349 act to cam the collar

348 in a right-hand direction until the teeth were again registered with each other, at which time the spring 345 forces the collar 348 to the left into its normal engagement with the teeth on the collar 350.

As the carriage C moves forwardly from its rearward position of Fig. 26 to its forward position of Fig. 28, the toggles are caused to straighten or move to their extended positions, and this straightening action is imparted in a primary sense to the toggles by applying a rearward or restraining force to the central pivot member or pivot shaft 244 so that as the forward movement of the carriage C progresses, the central pivot shaft 244 is restrained against continuation of such movement with the carriage C. In accordance with the present invention, the means for imparting such a restraining or retarding action to the central pivot shaft 244 is disposed so as to extend rearwardly from the toggle mechanism, and the same means is utilized not only to impart the primary straightening action or force to the toggle mechanism but also to impart the requisite actuating force to the toggle mechanism to initially break the toggles and render them responsive to the retracting action of the retracting means which includes the spring 345. In the present instance this primary actuating and controlling means for the toggles comprises a control link 360 which has an annular bearing loop 361 encircling the pivot shaft 244 at substantially the midpoint of said shaft. The control link 360 extends rearwardly from its point of connection with the pivot shaft 244 and rides in a downwardly opening notch formed between two downwardly projecting lugs 362 formed on the rear wall 221 of the carriage. From the point at which it is guided by the lugs 362 the control link 360 extends rearwardly and upwardly so as to provide a substantially horizontal portion to which the requisite restraining force is applied. In the present embodiment, this restraining force is applied to the control link 360 through the medium of the carriage actuating means, and to this end the control link 360 is operatively associated with the rocker arm 113.

As will be evident in Figs. 6, 7, 27 and 29, the rocker arm 113 has an upper sleeve 364 from which two radial arms 113' project in axially spaced relation, thereby to provide a space 113'' between the two arms 113', and these two arms 113' are connected at their lower ends by an integral transverse sleeve 365 in which the cross bar 122 is mounted. Upwardly of the cross bar 122, that is, radially toward the axis of the shaft 112, a cross pin 366 extends through the two arms 113' and across the space 113'' therebetween, and an operative connection for imparting some of the actuating movements to the control link 360 is provided through the medium of the cross pin 366. For this purpose a longitudinal slot 367 is formed in the control link 360 adjacent the rear end thereof, and the cross pin 366 extends through the slot 367, there being a pair of sleeves 368 on the cross pin 366 on opposite sides of the control link 360 which serve to maintain the control link 360 in a position midway between the two arms 113'. The engagement of the slot 367 with the cross pin 366 serves to provide a lost motion connection between the lever arm 113 and the control link 360, and the functioning and relationship of this lost motion connection will become apparent from a comparison of Figs. 38 to 43, inclusive, of the drawings, wherein the several elements of the platen actuating and control mechanism are illustrated in a plurality of different positions which are assumed successively during a printing cycle.

When the carriage C is in the retracted or rear position which it assumes at the end of a printing cycle, as shown in Fig. 38 of the drawings, the control link 360 and its slot 367 are related to the actuating arm 113 and its cross pin 366 in the manner there shown, the cross pin 366 being spaced considerably in a forward direction from the rear end of the slot 367. As the rock shaft 112 and the actuating arm 113 move in a counterclockwise direction so as to cause forward movement of the carriage C from its rear position of Fig. 38, the control link 360 initially moves forwardly with or at the same rate as the carriage C, but because of the different radial positions of the cross arm 122 and the cross pin 366 with respect to the axis of the shaft 112, the pin 366 moves forwardly at a slower rate than the cross arm 112. Since the control link 360 is at this time moving with the carriage C and the cross arm 122, it will be apparent that after a portion of the forward stroke of the carriage C has been completed, the rear end of the slot 367 moves into abutment with the cross pin 366. This relationship is shown in Fig. 39 of the drawings, and it will be observed that in this first portion of the rocking movement of the shaft 112 from the position of Fig. 38 to the position of Fig. 39, the differential relationship of the two pins 122 and 366 has caused the pin 366 to move through the distance Y indicated in Fig. 38 along the slot 367 thereby to engage the pin 366 with the rear end of the slot 367.

As the rock shaft 112 continues its movement from the position shown in Fig. 39 to the position shown in Fig. 40, this same differential relationship between the horizontal components of movement of the two cross pins 122 and 366 continues, and when the shaft 112 reaches the position shown in Fig. 40, the pin 122 will have moved forwardly or to the right in a horizontal direction through a distance somewhat greater than the horizontal movement of the cross pin 366. This differential between the movements of the two cross pins 122 and 366 is indicated by the letter X immediately below these two pins in Fig. 40 of the drawings, and it will be evident that by reason of this differential between the movement of the two cross pins 122 and 366, the carriage C will have moved through a distance greater than the movement of the control link 360. Hence, during this period of movement of the rock shaft 112, the upper and lower ends of the toggles are moved at the same rate as the carriage C, while the central pivot shaft 244 of the toggles is restrained by the control link 360 and moves at a slower rate, and as a result the toggle means 120 is shifted toward its extended relationship in the amount indicated in Fig. 40 of the drawings. Hence, the control link 360 may be termed a primary means for inducing the desired extension of the toggles.

During the operation of the control link 360 as a primary means for producing the desired extension of the toggles, the gearing mechanism produces rotative movement of the platen roller PR, such rotative movement being in a clockwise direction and being directly proportional to the forward advancing movement of the carriage C. This rotative movement of the platen may be termed a conditioning rotative movement and such conditioning rotation is necessary in order that the platen roller PR may be in the proper rotative position when the forward movement of

the carriage C and the downward advancing movement of the platen roller PR have been completed. In accordance with the present invention, the requisite conditioning rotation of the platen roller PR in a clockwise direction is substantially completed by the time the actuating mechanism and the carriage have reached the positions shown in Fig. 40 of the drawings, thereby assuring that prior to complete straightening of the toggle means 120 the platen face PF, which is to be active in the printing operation, is rotated in clockwise direction, as viewed in Fig. 40, in an amount sufficient to prevent objectionable pressure and reverse rotative movement and pressure of the edge 147 on the form, thereby to prevent smudging. Hence, in the present platen mechanism, when the carriage has reached the point of its forward movement shown in Fig. 40 of the drawings, there is but a very slight amount of further forward movement of the carriage required, and the conditioning rotative movement of the platen roller PR is substantially completed and a secondary or supplemental means is therefore provided whereby the extension of the toggles is completed independently of continued forward movement of the carriage C.

In accordance with the present invention, this secondary actuating means also functions to retain the toggles in their extended relationship during the return or operative printing stroke of the carriage, and in addition, serves to improve the characteristics of both the advancing and retracting movements of the platen roller PR. This supplemental actuating or control means, as herein shown, comprises a spring-biased lever arm 370 pivoted on the left-hand pivot pin 236 which connects the forward end of the left-hand actuating link 124 to the carriage C. As illustrated in Fig. 37 of the drawings, this pivotal mounting is provided by a sleeve 371 fixed on the end of the pivot pin 236 which projects to the right or toward the control link 360. The lever arm 370 has a suitable aperture therein to surround a reduced portion of the sleeve 371, and a nut 372 is threaded onto the end of the sleeve 371 so as to secure the lever arm 370 in the desired axial position thereon. The lever arm 370 projects forwardly from its pivot 236 through a slot 373 formed in the rear wall 221 of the carriage. At its forward end the lever arm 370 has an upwardly facing arcuate notch 375 which is adapted to be engaged with a pin or stud 376 which is located eccentrically with respect to the axis 240 upon an arm 377 which is formed integrally with the sleeve 350.

The lever arm 370 is urged in an upward direction by a spring 378 which is connected to the lever arm 370 at its lower end and at its upper end is connected to an anchor stud 379 which projects from a portion of the left-hand lug 230, as shown in Fig. 16 of the drawings. The sleeve 350 is, of course, fixed to the shaft 240 so as to rotate or rock therewith, and the arm 377 and the pin or stud 376 are so disposed on the shaft 240 that when the toggles are approaching their extended positions, the stud 376 engages a cam surface 370' on the end of the arm 370, as shown in Fig. 39 of the drawings. This camming action rocks the lever arm 370 downwardly, and when the toggles have moved relatively close to their fully extended positions, the stud 376 will ride from the cam surface 370' over the edge of the notch 375 as shown in Fig. 40. Hence the spring 378 will cause the arcuate notch 375 to exert a rearward camming action on the stud 376 which will cause rapid continued movement of the toggle to its extended position. It will be apparent, therefore, that when the toggles have moved relatively close to their extended positions, as shown in Fig. 40 of the drawings, the action of the spring 378 upon the lever 370 causes the arcuate notch 375 to operate with a camming action upon the stud 376 to impart a final rearward movement to the central pivot shaft 244 of the toggles so as to shift them toward and into their fully extended positions. Hence a relatively great shifting movement is imparted to the central pivot shaft 244 of the toggles during a very slight forward or advancing movement of the carriage C. When the toggles have moved to their fully extended positions, a flat surface 380' formed on the upper end of each lower toggle link 243 engages a flat upper surface of the slot 245 thereby to prevent movement of the toggles to an over-center position. Such engagement of the surface 380' with the top of the slot 245 serves to position the two links of each toggle in a truly aligned relation and cooperates with the positioning links 250 and 251 in maintaining the axis of the platen roller PR in the desired relationship to the carriage C during the rearward or operative printing stroke of the platen roller.

Since the lever arm 370 serves to hold the toggles in their extended positions, the return movement of the actuating rock shaft 112 and the actuating arm 113 causes the control link 360 to move in a rearward direction with relation to the actuating links 124 during such return stroke of the carriage. During such relative movement of the control link 360, means carried upon this link is arranged to strike an abutment which retards further rearward movement of the link 360. When such further rearward movement is stopped, the rearward movement of the central pivot shaft 244 of the toggles is likewise stopped, and as the carriage C moves further in a rearward direction, the toggles are in effect broken, that is, their movement toward retracted or folded relationship is initiated. It will be understood that the spring 378 acts upon the lever arm 370 with a sufficient force to maintain the toggles in their extended relationship against the normal forces acting upon the various elements of the toggle mechanism and the platen roller during the printing stroke of the platten roller, but when a positive actuating force is applied to the central pivot shaft 244 of the toggles, such force overcomes the retaining action of the lever arm 370 and will cause the desired breaking of the toggles and thereby move the central pivot shaft 244 thereof forwardly with relation to the upper and lower shafts or pivots of the toggles. Such initiation of the retracting movement of the toggles causes the stud 376 to move against the arcuate forward side of the notch 375 in the lever 370, and the resulting cam action rocks the lever arm 370 downwardly until the stud 376 moves over the forward edge of the notch 375 and onto the sloping forward cam surface 370' of the lever arm 370. The upward force of the spring 378 upon the lever arm 370 then acts through the cam surface 370' to augment the retracting action of the torsion spring 345, and the platen roller PR is thereby withdrawn rapidly to its retracted position of Figs. 26 and 38. The relationship of the cam surface 370' to the stud 376 when it produces such accelerated or augmented retracting action is illustrated in Fig. 43 of the drawings, the stud 376 in this figure having moved onto the upper portion of the cam surface 370'.

As hereinbefore pointed out, it is often desirable to vary the point at which such retraction of the platen roller PR is initiated, this possibility of variation being desirable since the platen roller PR is often so formed as to avoid printing of one or more of the terminal lines of type on a printing device. Such an adjustment or formation of the platen roller PR is illustrated in Fig. 13 of the drawings wherein the terminal edge 148' of the platen face PF is arranged in such a position and relation that the printing operation is terminated after the printing of the first three lines of type from the printing device D. In such an instance many operators consider it desirable to initiate withdrawal of the platen roller PR immediately upon completion of the printing of the last selected line of type.

Such adjustment of the point of withdrawal of the platen roller PR is attained through the further utilization of the control link 360, and for this purpose an abutment means in the form of an abutment lug 380 is mounted upon the control link 360 so that it may be secured in various adjusted positions longitudinally of the link 360. In the present instance, this abutment lug 380 is mounted in and is adjustable along the slot 367 and is maintained in the desired position and relation by means of a rectangular rib 381 which projects, as shown in Fig. 16 of the drawings, from one side of the abutment lug 380, this projection 381 extending into the slot 367 so as to ride in relatively firm sliding relationship with upper and lower side edges of the slot. The lug 380 is held in position by a screw 382 which passes through a washer 383 and is threaded into the projection 381. The washer 383 is of a width substantially greater than the width of the slot 367 so that when the screw 382 is tightened, the abutment lug 380 is secured in position upon the control link 360.

When the actuating mechanism is moving the carriage C through its rearward or operative printing stroke, the abutment lug 380 is arranged to strike suitable abutment means at the proper time in such return stroke to initiate the desired retracting or upward movement of the platen roller PR, and in the present instance this cooperating abutment means is mounted on the rocker arm 113 so that a differential motion is brought into play in much the same sense as in the extending movement of the toggles, as hereinbefore described. The rocker arm 113 is therefore provided with a cross pin 385, extending between the two arms 113' of the rocker arm at a point located between the cross pin 366 and the axis of the shaft 112, there preferably being a sleeve 386 surrounding the cross pin 385 between the two side portions 113' of the rocker arm 113. Since the movement of the parts is relatively rapid, the rear face of the abutment lug 380 is preferably provided with a spring element 388 secured in place by a screw 389, and this spring element 388 is arranged to provide the desired abutment between the abutment lug 380 and the cross member 385.

The operation of the abutment lug 380 in initiating retracting movement of the platen roller PR is best illustrated in Figs. 42 and 43 of the drawings. It will be noted in Fig. 42 of the drawings that the carriage C has in its rearward stroke moved to such a point that the abutment lug 380 is in engagement with the cross pin 385, so that in further rearward movement of the carriage the rate of movement of the carriage by its actuating links 124 will exceed the rate at which the cross pin 385 moves in a rearward direction, with the result that the movement of the control link 360 will be retarded. Hence the central pivot shaft 244 of the toggles will, in effect, be held against rearward movement so that the carriage and the associated upper and lower ends of the toggles will move rearwardly with respect to the shaft 244, and this operation or relationship is illustrated in Fig. 43 of the drawings wherein it will be noted that the toggle has been broken and is in such a condition that it may be drawn rapidly to its retracted position by means of the spring 345 (Figs. 30 and 37) and the action of the spring-biased cam surface 370'.

It will be observed, of course, that the position of the abutment lug 380 may be adjusted along the slot 367 so as to vary the point at which such withdrawing movement of the platen roller is initiated, and ordinarily the operator makes this adjustment in accordance with the terminal cut-off operation of the particular platen face which is being used. In some instances the abutment lug 380 may become loose in its slot 367, or the operator may fail to secure the abutment lug in position, and means is provided which is operable in such instances to cause withdrawal of the platen roller PR just prior to the time when the carriage C reaches the rearward limit of its stroke. This supplemental means includes a pin 390 projecting laterally from the control link 360, as shown in Fig. 27 of the drawings, and this pin 390 is arranged in the rearward movement of the control link 360 to engage a stationary abutment. This stationary abutment is provided on the mounting plate 92, as shown in Fig. 31 of the drawings. Preferably, the abutment means is provided by an angle bracket 391 having one leg secured by a screw 392 to the bottom of the rear cross bar 161 of the supporting plate 92. The other leg of the angle bracket 391 projects downwardly and has a pair of spring arms 394 and 395 secured to its front and rear faces, respectively. In the course of the rearward movement of the carriage C, the pin 390 may in some instances engage the forward face of the forward spring arm 394 so as to retard the rearward movement of the control link 360 and thereby induce breaking of the toggles in substantially the same manner as the abutment lug 380. It will be understood, of course, that such action of the pin 390 and the spring arm 394 takes place only in the event that the abutment lug 380 is positioned in substantially the forward end of the slot 367, and that in all other instances the breaking of the toggles is induced through the action of the abutment lug 380 and the associated cross pin 385.

The rear spring arm 395 is arranged to cooperate with a pin 398 which projects from the control link 360 in such a position as to cooperate with other elements of the structure during the forward stroke of the carriage C to bring about the desired supplemental actuation of the central pivot shaft 244. Thus the pin 398 is so positioned on the control link 360 that while the stud 376 is camming rearwardly over the cam surface 370', the pin 398 serves to bend and impart tension to the spring arm 395. Thus when the stud 376 moves from the cam surface 370' and onto the upper surface of the lever 370, the spring 395 acts upon the control link 360 to move the pivot shaft 244 rapidly in a rearward direction. This action serves to bring the stud

376 more rapidly into a position where it may be acted upon by the camming surface of the arcuate notch 375, and hence the pin 398 and the spring arm 395 cooperate with the supplemental actuating means of the platen roller PR to bring about a more desirable mode of actuation of the platen roller in its downward advancing movement.

In Figs. 44 to 50, inclusive, of the drawings, there is illustrated an alternative embodiment of the present invention wherein means is provided whereby the operator may selectively employ any one of a plurality of operative platen faces which are provided on the platen roller PR, and such selection may be made in this embodiment of the invention without removal or replacement of the platen roller PR. Thus, as shown in Figs. 49 and 50, the platen roller PR in this embodiment may have a plurality of platen faces such as the platen face PF and the platen face PF—2 disposed in different sectors of the periphery of the platen roller PR, as described generally in connection with Figs. 11 to 13, inclusive, of the drawings. It will be noted in Figs. 49 and 50 that the platen face PF corresponds in form and position with the platen face PF illustrated in Fig. 12 of the drawings, this platen face being arranged to provide an initial cut-off which avoids printing of the line 143 of type shown in the printing device D illustrated in Fig. 10. The platen face PF shown on the platen roller of Figs. 49 and 50 is related to the index mark X—1 in the same manner as the platen face PF of Fig. 12, while the other platen face PF—2 is formed in a predetermined relation to the other index mark X—2, the position and location of which has been described in connection with Figs. 11 to 13, inclusive, of the drawings. The platen face PF—2 could, of course, have any desired form and relationship to the index mark X—2, but for purposes of illustration the platen face PF—2 is formed in the same manner as the platen face PF illustrated in Fig. 11 of the drawings, but in Figs. 49 and 50 of the drawings this platen face is disposed or located on the platen roller PR with relation to the index mark X—2 rather than with relation to the index mark X—1.

In this embodiment of the invention, means is provided whereby the operator may render the platen faces PF or PF—2 selectively effective in a printing operation and this selection of the platen faces is accomplished by means associated with the gearing which imparts the desired rotative or rolling movement to the platen roller during the printing operation. In the present instance this selection is effected by shifting of the rack 320 and for this purpose a plurality of rack teeth 400 are formed along the upper edge of the rack 320 adjacent the rear end thereof, and means are provided for shifting the rack 320 longitudinally so as to vary its initial relationship with respect to the gearing means and particularly with respect to the gear 311.

It will be recalled that in the embodiment of Figs. 1 to 43 of the drawings, the rear end of the rack 320 was pivotally supported upon a bracket 323 carried on the vertical or side wall 324' of a housing 324. In the present embodiment the bracket 323 is replaced by means which also provides a pivotal support for the rack 320, and in addition provides for longitudinal adjustment of the rack 320 between a plurality of positions which determine which of the platen faces is to be effective in a printing operation. Thus, as shown in Fig. 45 of the drawings, the housing 324 has a U-shaped bracket 401 mounted therein so as to provide spaced bearings 402 and 403 for a shaft 404 which projects through the side wall 324' of the housing 324. On the outer or projecting end of the shaft 404 a knob 405 is fixed and this knob has an off-center index pin 406 projecting therefrom and adapted for registration with either one of two index openings 407 formed in an index plate 408 secured as by screws 409 to the outer face of the vertical side wall 324' of the housing 324. Between the two bearings 402 and 403 the shaft 404 has a relatively wide pinion 410 pinned thereto and this pinion 410 is meshed with the teeth 400 formed on the upper edge of the rack 320. The rack 320 is supported in such meshed engagement with the lower edge of the pinion 410 by means of a guide plate 411 which engages the right-hand side of the pinion 410, as shown in Fig. 45 of the drawings. This plate 411 has an aperture 412 through which the shaft 404 extends, thereby to pivotally support the plate 411 on the shaft 404. At its lower edge the plate 411 has a pair of transversely extending arms 414 which engage the lower edge of the rack 320 so as to support the rack in engagement with the lower edge of the pinion. The rack 320 is maintained in the proper lateral position by engagement in a slot 415 formed in an upwardly projecting web 416 in the U-shaped member 401.

The index pin 406 is urged toward engagement with one or the other of the openings 407 by means of a coil spring 418 which surrounds the shaft 404 between the bearing 403 and the plate 411, this spring 418 tending to shift the shaft 404 and the associated parts to the left in Fig. 45. Hence, when it is desired to rotate the pinion 410, the knob 405 is withdrawn to the right in Fig. 45, thereby to disengage the index pin 406 from the index openings 407 with which it has been engaged. The shaft 404 and the pinion 410 may then be rotated until the index pin 406 is aligned with the other one of the index openings 407. Such withdrawing movement of the shaft 404 is in the present instance limited by engagement of the plate 411 with an abutment shoulder 420 formed on the web 416, as shown in Fig. 45 of the drawings.

The positioning of the index openings 407 is so related to the pinion 410 and to the other elements of the gear train that when the index pin 406 is engaged with one of the index openings 407, the platen face PF will be positioned rotatively so as to be active or operative in the printing operation, while when the index pin 406 is engaged with the other of the index openings 407, the platen face PF—2 will be operative in the printing operation. Thus, as shown in Fig. 49 of the drawings, the index pin 406 is engaged with the rear one of the index openings 407 and the rack 320 is withdrawn to its rearmost position. With this adjustment of the parts, the platen face PF—2 is rendered operative in the printing operation, as will be evident from its location in Fig. 49 of the drawings. In Fig. 50 of the drawings, the index pin 406 is illustrated in engagement with the forward one of the two index openings 407 so that the rack 320 has been moved to its forward position. With this positioning of the parts the platen face PF is rendered operative in the printing operation, as will be evident in Fig. 50 of the drawings.

This comparatively easy adjustment or selection of the platen face which is to be operative, finds several advantageous uses, as for example,

when the operator desires to employ selectively the different cut-off arrangements or adjustments which may be provided on different platen faces of the same platen roller. In other instances, where the same cut-off is to be used, the different platen faces of the same platen roller may be formed from resilient materials having different characteristics. For example, one of the platen faces may be somewhat harder than the other so that the operator may readily shift one or the other of the two platen faces into operative position and thereby attain a better matching of the printing impression with the characteristics of the paper or of the ribbon or with other governing factors. Thus, in either of these instances, different platen faces have different impression-forming characteristics, and the platen face having the desired impression-forming characteristics may be rendered effective by the operator through a relatively simple adjustment.

In Figs. 51 to 60, inclusive, of the drawings, another embodiment of the present invention is illustrated, this embodiment being particularly adapted for use where successive printing impressions are to be made from different portions of the type carried by a printing device, the different impressions being made by providing selectively operable platen faces having different line cut-offs. In the embodiment illustrated in Figs. 51 to 60, inclusive, the selective printing of different portions of the information carried by a printing device D in successive printing cycles is accomplished automatically so that this embodiment of the invention is particularly adapted for use in connection with a two-column listing operation. Such two-column listing operations may be accomplished with the printing machine herein disclosed through the use of a two-column listing attachment of the character described and claimed in my co-pending application, Serial No. 410,097, filed September 8, 1941, through the use of which the sheet S is so advanced and shifted laterally that a first impression from a particular printing device may be made with a platen face PF—2 so as to print, for example, the name and address from the first two lines of a printing device such as that shown in Fig. 13 of the drawings, this first printing impression being made in the first or left-hand column of the sheet, and thereafter a second printing impression is made from other lines such as the lower three or more lines of the printing device through the use of a suitably formed platen face PF—4, this second impression from the same printing device D being made in the second or some other more right-hand column of the sheet S. The arrangement of platen faces required to effect the above described two-column listing operation is illustrated in Figs. 51, 59 and 60 of the drawings, it being observed that the platen face PF—3 is in this instance located in that sector of the periphery of the platen roller which lies in a clockwise direction from the index point X—1, while the platen face PF—4 is located in the sector of the periphery of the platen roller which lies in a clockwise direction from the index point X—2.

In the embodiment illustrated in Figs. 51 to 60, inclusive, the shifting of the platen roller PR so as to render the two platen faces PF—3 and PF—4 selectively effective in the desired sequence is attained automatically so that such shifting or selective operation of the two platen faces PF—3 and PF—4 does not require attention or skill on the part of the operator. It will be understood, of course, that when more than one printing impression is to be made from each printing device D, the machine is so adjusted that advancing of the printing device D out of the printing position and into the collecting drawer K is delayed until the desired number of printing impressions have been made from the printing device. The mechanism for causing such operation of the machine is disclosed in my aforementioned co-pending application, Serial No. 388,998, filed April 17, 1941, in which it is pointed out that such printing operations of the machine are under the control of a duplicate or multiple printing control pedal 425, as shown in Fig. 1 of the drawings.

In attaining such automatic shifting or selection of the platen faces PF—3 and PF—4, the rack 320 of the platen gearing is shifted longitudinally in the same general manner as in the embodiment disclosed in Figs. 44 to 50, inclusive, there being an actuating shaft 404' mounted in a U-shaped bracket 401' supported on the housing 324 in substantially the same manner as in the embodiment of Figs. 44 to 50, inclusive. The shaft 404' has a gear 426 meshed at its lower edge with the rack teeth 400 formed on the upper edge of the rack 320, and a carrier plate 411' is mounted on the shaft 404' so as to engage the lower edge of the rack 320 and maintain the same in engagement with the gear 426. This manner of support provides for pivotal movement of the rack 320 during adjustments of the printing pressure in substantially the same manner as the pivot 322 shown in the embodiment of Figs. 1 to 43. The rack 320 is guided in a lateral sense by a groove 427 formed in a web 428 in the lower portion of the U-shaped bracket member 401'.

A coiled spiral torsion spring 430 surrounds the shaft 404' between the two spaced bearings provided between U-shaped bracket 401', as shown in Figs. 53 and 58, and the inner end of the torsion spring 430 is anchored as at 431 on the shaft 404' while the outer end of the spring 430 is anchored as at 432 to a portion of the U-shaped bracket 401', as shown in Fig. 58. The action of the spring 430 is such that it tends to rotate the shaft 404' in a clockwise direction (Fig. 51), thereby to tend to withdraw the rack 320 in a rearward direction, that is, in a left-hand direction, as viewed in Figs. 51, 59 and 60.

Means is provided whereby the shaft 404' is automatically actuated to shift the rack 320 back and forth between the positions required to render the desired platen faces effective. In the present instance, two such platen faces PF—3 and PF—4 are provided, and hence the automatic means is arranged to shift the rack 320 back and forth between the two positions required to render these two platen faces PF—3 and PF—4 effective in the desired printing operations. In the present embodiment, this automatic means is arranged for actuation by the means which actuates the platen carriage C, the operative connection being provided between the rocker arm 113 and the shaft 404'. Thus, as shown in Figs. 51 to 54, inclusive, a supplemental housing 435 is mounted on the outer face of the vertical wall 324' of the housing 324 and the requisite operating mechanism is mounted within this housing. The housing 435 has a vertical wall 435' with a horizontally extending wall 436 along its upper and side edges. The

mounting of the supplemental housing 435 is accomplished by means such as screws 437 which extend through the wall 435' and are threaded into the vertical wall portion 324' of the housing 324. Within the supplemental housing 435 cam-controlled actuating means is provided for actuating and controlling the rotative position of the shaft 404', and means is provided for actuating this cam-controlled actuating means from the rocker arm 113. The cam-controlled actuating means, as herein shown, includes a gear segment 440 suspended pivotally by means of a sleeve 441 from a pivot stud 442 mounted in the vertical wall 435' of the housing 435 a substantial distance above the axis of the shaft 404'. This gear segment 440 engages a pinion 443 pinned on the projecting end of the shaft 404' so that the rotative position of the shaft 404' may be governed by controlling the position of the gear segment 440. Such control of the segment 440 is attained through the medium of cam means including a cam roller 445 mounted on a stud 446 which projects from the segment 440 a substantial distance below the axis of its supporting stud 442. The cam roller 445 is adapted to engage with the surface or peripheral edge of a cam plate 450 and it is through actuation of the cam 450 that the segment 440 is rocked back and forth so as to control or select the platen faces which are to be effective. The cam 450 is mounted rotatively upon the enlarged bearing stud or head 451 formed on a bolt 452 which extends through a boss 453 formed on the wall 435', and preferably this bolt 452 extends through the vertical wall 324' of the housing 324 and has a nut 455 thereon so that it acts also as a part of the means for holding the supplemental housing 435 in position. The spring 430 acts, of course, through the shaft 404' and the pinion 443 to bias the segment 440 in a counterclockwise direction, as viewed in Fig. 51, thereby to yieldingly maintain the cam roller 445 in engagement with the peripheral edge of the cam 450, and the peripheral edge of the cam 450 is formed with different cam surfaces or positions such that by shifting the cam 450 about its supporting axis, the cam roller 445 may be actuated to either one of two different positions, one of these positions, shown in Figs. 51 and 59, being such as to permit the spring 430 to withdraw the rack 320 in a rearward direction in the amount required to render the platen face PF—4 effective in a printing operation of the platen mechanism. One such surface on the cam 450 is indicated at 460, while another such surface, spaced from the axis of the cam 450 a distance greater than the spacing of the cam surface 460, is indicated at 461, and in accordance with the number of impressions which are to be made from each of the platen faces PF—3 and PF—4, cam surfaces corresponding to the cam surfaces 460 and 461 are formed about the periphery of the cam 450. In the present instance the cam 450 is designed in such a manner that when used with the actuating mechanism herein shown, the platen faces PF—3 and PF—4 are moved into operative position alternately. Hence the cam 450 is so formed that cam surfaces 460 and 461 alternate with each other about the periphery of the cam, there being, of course, connecting leading and receding surfaces so as to provide for proper operation and control of the movement of the cam roller 445. In the present instance actuating means is provided for the cam 450 which in each printing cycle of the platen carriage C imparts a 60° advancing movement to the cam 450 about its supporting axis. In providing for such 60° actuation of the cam 450, a ratchet wheel 465 having six equally spaced teeth 466 is mounted in fixed relationship to the cam 450, the cam 450 and the ratchet wheel 465 being mounted on opposite faces of a centrally apertured hub 467, there being reduced portions on opposite ends of the hub upon which the cam 450 and the ratchet wheel 465 are centered and are held in assembled relationship by tie pins 468. After the cam and ratchet wheel assembly has been mounted upon the bearing stud 451, it is held in position thereon by a cover plate 470 which is secured in place by screws 471, one of which extends through the cover plate and is threaded into the stud 442, and the other of which extends through the cover plate 470 and is threaded into the bearing stud 451.

The cam assembly is actuated in each operating cycle of the carriage C by means of a pawl 475 which is pivoted at one of its ends on the cross pin 385. The pawl 475 is relatively long and extends in a forward direction just below and outside of the cover plate 470, as shown in Fig. 54, and at its forward end the pawl 475 has a projecting pin 476 which extends beneath the lower edge of the cover plate 470 so as to be engageable with the teeth 466 of the ratchet wheel 465. The pawl 475 is biased by means of a torsion spring 478 acting between the pawl 475 and the rocker arm 113 so that the pin 476 tends to engage the edge of the ratchet wheel 465. In the advancing or forward movement of the rocker arm 113, the pin 476 of the pawl 475 is moved into engagement with the lowermost one of the teeth 466, and the arrangement is such that continued forward movement of the rocker arm 113 to the end of its forward stroke serves to move the ratchet and the associated cam 450 through 60° about the axis of the bearing stud 451. Thus, if the cam roller 445 is initially located in engagement with one of the surfaces 460 of the cam 450, the movement of the ratchet wheel and the cam 450 through 60° in the course of a forward advancing movement of the carriage C will serve to move the next cam surface 461 into operative engagement with the cam roller 445. Such shifting of the cam 450 causes the segment 440 to be rocked in a clockwise direction from its position of Figs. 51 and 59 and into the position shown in Fig. 60 of the drawings. It will be observed that such shifting movement of the segment 440 causes corresponding shifting movement of the rack 320, and this shifting movement takes place during the idle or conditioning stroke of the platen carriage C. Hence, during the operative printing or return stroke of the carriage C, the platen face PF—3 will in this instance be rendered effective in the printing operation.

In the next forward or conditioning movement of the carriage C, the pawl 475 will move into operative engagement with the next one of the teeth 466 and will advance the cam 450 through another 60° increment of movement, thereby to shift the cam 450 until the cam roller 445 moves off of the relatively high surface 461 and onto the next surface 460 of the cam. This permits return movement of the segment 440, by the spring 430, in a counterclockwise direction so that it again assumes the position of Figs. 51 and 59. Such shifting of the segment 440 causes the rack 320 to be correspondingly shifted so that the platen

face PF—4 is automatically positioned in such a relationship that it will be effective in the return or printing stroke of the carriage C.

When it is desired to dispense with the automatic shifting or selection of platen faces, it is unnecessary to remove the cam assembly, there being a control disc 480 mounted on the inner face of the cover plate 470 in such relation that it may be shifted so as to render the pawl 475 inoperative. In the present instance, the control plate 480 has a threaded stud 481 projecting therefrom through an arcuate slot 482 formed in the cover plate 470, and a fastening nut 483 is provided on the projecting end of the stud 481. This arcuate slot is centered upon the axis of the lower mounting screw 471, and the control plate 480 has an opening formed therein adapted to be positioned about the outer end of the bearing stud 451. During normal operation of the automatic platen selecting mechanism, the control disc 480 is positioned as shown in Fig. 55 of the drawings, wherein it will be evident that the control disc is cut away at 484 so as to permit the pawl 475 to move into operative engagement with the teeth 466 of the ratchet wheel 465. When it is desired to render the pawl 475 inoperative, the control plate 480 is shifted in a clockwise direction as viewed in Fig. 55, until it reaches the position shown in Fig. 56, and in this position the cam control disc 480 provides a surface 485 which is engaged by the pin 476 of the pawl 475 during the advancing movement of the rocker arm 113. This engagement of the pin 476 with the surface 485 of the control disc 480 serves to guide the pin 476 past the lower tooth 466 so that the pawl 475 is ineffective to impart rotative movement to the cam assembly.

The cam and ratchet assembly herein illustrated provides, of course, for alternate selection of the two platen faces PF—3 and PF—4, but this sequence may be readily changed by removal of this particular cam and ratchet assembly and substitution of a different assembly wherein the cam faces 460 and 461 are disposed in the different sequence which is desired. Such removal and replacement may be readily effected after removal of the cover plate 470.

Operation

When the printing machine is at rest between printing cycles, the platen mechanism P is positioned as shown, for example, in Figs. 3, 4 and 38, with the platen carriage C in its rearward position and with the platen roller PR withdrawn to its upper and inactive position. While the platen mechanism is thus positioned, a platen roller PR having the desired platen face or cut-off characteristics, such as the platen face PF, is mounted in position on the mounting pin 280 so as to condition the platen mechanism P for the production of printing impressions from the selected line or lines of type of the printing devices D. Such printing devices D are sequentially advanced to printing position on the anvil A beneath the inked ribbon R, and after a suitable form or sheet S has been positioned so as to be supported by the shield 150 over the inking ribbon R, the platen mechanism P is operated through a printing cycle so as to effect printing cooperation of the sheet S with the printing device D which is then at printing position.

Such actuation of the platen mechanism P through its printing cycle is initiated in most instances by depression of the control pedal 116 which releases the one-revolution clutch 102 for operation through its one-revolution cycle by the constantly driven drive shaft 100. The clutch 102 acts to correspondingly rotate the eccentric 101 through one revolution, so as to reciprocate the link 103 and cause a rocking cycle of the lower rock shaft 106. By means of the connecting lever and linkage system this rocking movement of the lower shaft 106 produces a corresponding rocking cycle of the upper rock shaft 112, and this rocking movement of the shaft 112 is utilized to reciprocate the platen carriage C.

By means of the overload release connection of its cross bar 122 with the carriage-actuating links 124, the arm 113 actuates the carriage forwardly during the first half of the rocking cycle of the rock shaft 112, and then withdraws the carriage C positively in a return or reverse direction during the concluding half of the rocking cycle of the shaft 112. In the course of such forward movement of the platen carriage C the toggle means 120 are actuated to advance the platen roller PR downwardly to the active position of Fig. 41, and the gearing means is also active to impart a preliminary or conditioning rotation to the platen roller PR so as to position the platen face PF thereof in the proper rotative relation to attain the desired cut-off action in the subsequent rearward or printing stroke of the platen roller.

The lowering or advancing movement of the platen roller PR to its active position is effected by straightening of the toggle means 120 from its folded relation of Fig. 38 to its extended relation of Fig. 41, and this straightening action is attained through the cooperative action of a primary actuating means which operates in timed relation with the forward movement of the platen carriage C and a secondary actuating means which is, in a sense, dependent upon the forward movement of the carriage but, when brought into action, operates independently of continued forward movement of the carriage to complete the extension of the toggle means 120. The downward actuation of the toggle means 120 is effected against the yielding force of the adjustable torsion spring 345 which tends normally to fold the toggle means and thereby withdraw the platen roller PR to its inactive position of Fig. 38.

The primary downward actuation of the platen roller PR is effected by the control link 360 which during a portion of the forward actuation of the carriage C is retarded or restrained by the cross pin 366 of the arm 113 so as to move forwardly at a rate slower than that of the carriage. This results in correspondingly retarding the central pivot shaft 244 of the toggle means, and hence a straightening action is induced in the toggle means 120 which lowers the platen roller PR toward its active position. As the carriage C approaches the forward limit of its stroke, such straightening of the toggle means causes the stud 376 to engage the cam surface 370' on the forward end of the spring biased lever 370, thereby to rock the lever 370 downwardly against the biasing action of its spring 378.

As the lever 37 reaches the lower extent of its movement the pin 390 on the control link 360 engages and applies a slight tension to the spring arm 395, so that when the stud 376 rides onto the top of the lever 370 and off of the upper end of the cam surface 370', the spring arm 395 acts to shift the control link 360 and the stud 376 rearwardly to a point overlying the forward half of the arcuate notch 375. The spring 378 then acts

to draw the arm 370 upwardly so as to exert a camming action on the stud 376, and this camming action serves to shift the toggles to their fully extended positions independently of continued forward movement of the carriage C. Thus the lever 370 and the elements associated therewith act as a secondary means for imparting the desired conditioning movement to the platen roller PR.

At the time when the secondary actuating means comes into play to complete the downward extension of the toggle means, the forward movement of the carriage is substantially complete, so that the conditioning rotative movement of the platen roller is also substantially completed. Hence the initial cut-off edge of the platen face completes its upward and rearward conditioning movement without exerting objectionable force on the sheets, and as a result smudging is avoided even when a considerable number of carbon copies are being made.

The conditioning movement thus imparted to the platen roller serves to locate the platen face PF in such a position that in the return or rearward stroke of the platen carriage the platen face PF will be rolled across the sheet S so as to bring about printing cooperation of the sheet with only those lines of type which have been selected by the form and position of the platen face PF on the platen roller PR.

Rearward movement of the carriage C is induced by rearward rocking movement of the arm 113, and in such movement the control link 360 initially idles along the pin 366, and the toggles are held in their extended relation by the restraining action of the spring-biased lever 370 upon the stud 376. Upon completion of the printing of the last selected line of type, the abutment lug 380 strikes the cross pin 385 and rearward movement of the central pivot shaft 244 of the toggles is thereby retarded to a rate which is less than the rate of rearward movement of the carriage. As a result, the stud 376 is urged forwardly against the sloping forward side of the arcuate notch 375 and the lever 370 is thereby cammed downwardly until the forward edge of the notch 375 is shifted rearwardly beneath the stud 376. The cam surface 370' then moves beneath the stud 376 and is urged upwardly so as to augment the action of the torsion spring 345 in producing upward withdrawal of the toggles and the platen roller PR.

In the event that the printing impression thus produced is uneven, thereby indicating that the path of platen movement is not level or parallel to the face of the type, the requisite levelling of the platen may be accomplished by adjustment of one or more of the levelling screws 170. This adjustment operates to level the support plate 92 and its tracks 91, and after completion of the levelling operation the several levelling screws 170 are fixed in their adjusted rotative positions by means of their locking screws 215.

Thereafter the platen mechanism is maintained in levelled relation by the locked relation of the levelling screws, and vertical adjustments may be effected by means of the knob 95 so as to vary the printing pressure.

In the platen mechanism of the present invention this adjustment of the printing pressure is attained independently of the line cut-off adjustment, this result being attained by reason of the construction of the geared drive of the platen roller PR. This geared drive is such that within the normal range of printing pressure adjustments the relationship of elements of the gearing is not varied or disturbed by adjustments of printing pressure. Thus in the embodiment of Figs. 1 to 43, the initial pinion 311 of the geared drive engages the horizontal rack 320 at a point spaced a substantial distance from the pivot 322 which fixes the rack 320 against longitudinal movement. With this construction the vertical movement of the pinion 311 entailed in a printing pressure adjustment merely pivots the rack 320 through a slight angle while maintaining the same geared relationship between the rack 320 and the pinion 311. Hence the line cut-off adjustment previously made by the form and positioning of the platen face PF is maintained the same.

Since each platen roller PR must, in its mounting, be associated with the gearing in a predetermined relation, a particular platen roller, when again put in place in the machine, will invariably attain the cut-off for which it was originally designed. When an operator wishes to vary the point of withdrawal of the platen roller so as to correspond with the final cut-off adjustment of a particular platen roller or platen face, the abutment lug 380 is adjusted along the slot 367 so as to strike the cross pin 385 at the desired point in the retracting stroke of the carriage.

In the embodiment of Figs. 44 to 50, the platen mechanism of the present invention may be manipulated readily and easily by the operator to select, for operation, any one of a plurality of platen faces provided on a single platen roller. Such selection is effected by actuation of the selecting knob 405, which shifts the rack 320 to any one of a plurality of longitudinal positions. The selected positioning of the rack 320 operates to determine the platen face which will be effective in the printing operation, and this selection is utilized to change the impression-forming characteristics of the platen mechanism. In some instances the platen faces of a particular platen roller may be of different hardness, so that the selection by means of the selecting knob 405 may be utilized to vary the character of the printing impressions, while in other instances the different platen faces of a particular platen roller may be formed with different line cut-off characteristics, and in such an instance the selecting knob 405 may be operated to change the cut-off action of the platen mechanism.

The embodiment of the invention illustrated in Figs. 51 to 60, inclusive, of the drawings provides for variation of the impression-forming characteristics of the platen mechanism in the same sense as the embodiment of Figs. 44 to 50, inclusive, but in the form illustrated in Figs. 51 to 60, inclusive, this change or selection is automatically attained. The shifting or automatic selection of the platen faces is attained by the replaceable cam and ratchet assembly which is operated by the pawl 475 so as to rotate the cam 450 through a predetermined angle as an incident to each operation of the platen mechanism. The cam 450 is so formed as to actuate a roller 445 which has a geared operating connection with the pinion 426.

Thus the cam 450 operates through the pinion 426 in opposition to the spring 478 to determine the longitudinal position of the rack 320 and this, in turn, determines which of the platen faces is to be operative in the printing operation. The cam faces 460 and 461 in the cam 450 may be positioned in different sequence to produce corresponding sequential selection of the platen

faces, but, in the form illustrated, the cam 450 is so formed as to shift the two platen faces into operative position alternately. With this arrangement of the cam faces of the cam 450 the platen mechanism is particularly adapted for two-column listing and similar operations.

The hereinabove described novel apparatus is effective to produce printing impressions on sheets or the like and reference herein to a sheet is to be understood to be generic to either a printed or unprinted sheet or to an envelope or the like and all else upon which an impression is made upon operation of the novel apparatus of the present invention.

From the foregoing description it will be evident that the present invention materially simplifies the use of roller platen mechanisms, in that the line cut-off and printing pressure adjustments are rendered wholly independent. Hence an operator may readily and easily make the adjustments required to produce printing impressions of the best quality or appearance. The present platen mechanism also improves the characteristics of the conditioning movements of the platen roller in that the downward advancing movement of the platen roller is completed by a secondary actuating means after substantial completion of the forward movement of the carriage. Hence the present invention imparts a wider field of usefulness to roller platen mechanisms and makes it possible to produce carbon copies without objectionable smudging thereof.

It will also be evident that the present invention simplifies the use of roller platen mechanisms in that different platen faces of a single platen roller may be easily and conveniently selected, either manually or automatically.

While I have illustrated and described selected embodiments of my invention, it is to be understood that these are capable of variation and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a printing machine, a platen mechanism including a carriage, a platen roller on said carriage, track means for said carriage, means for moving said platen roller relative to said carriage into and from an operative position wherein the roller is effective to press a sheet into printing relation with a printing device supported in cooperative relation with said platen mechanism, means for moving the carriage along the track means to thereby move said platen roller across said printing device, adjusting means effective to vary the pressure exerted by said platen roller in pressing a sheet into printing relation with the printing device, gearing means for imparting predetermined rotative movement to said platen roller to thereby insure predetermined cooperation between the printing roller and the printing device during movement of the roller across the device, and means supporting said gearing means and operative upon manipulation of the adjusting means to vary the pressure exerted by said platen roller to maintain the predetermined relation between the platen roller and the printing device.

2. In a printing machine, a platen mechanism including a carriage, a platen roller on said carriage, track means for said carriage, means for moving said platen roller relative to said carriage into and from an operative position wherein the roller is effective to press a sheet into printing relation with a printing device supported in cooperative relation with said platen mechanism, means for moving the carriage along the track means to thereby move said platen roller across said printing device, adjusting means effective to vary the pressure exerted by said platen roller in pressing a sheet into printing relation with the printing device, gearing means for imparting predetermined rotative movement to said platen roller to thereby insure predetermined cooperation between the printing roller and the printing device during movement of the roller across the device, and a movable support for said gearing means operable to maintain the predetermined relation between the platen roller and the printing device upon manipulation of the adjusting means to vary the pressure exerted by said platen roller.

3. In a printing machine of the character described, an anvil upon which a printing device may be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing such a sheet toward such a printing device to produce an impression from the printing device onto the sheet, said platen mechanism comprising a supporting arm extending over said anvil in spaced relation thereto, supporting means mounted on said arm over said anvil, a carriage supported and guided on said supporting means for reciprocation along a path which extends over said anvil, a platen roller, means mounted on said carriage for advancing said platen roller from a retracted position with relation to said anvil to an operative printing position wherein the platen roller may be moved along a path parallel to said anvil to press a sheet toward a printing device supported on said anvil to produce an impression from said printing device onto said sheet, means operable to vertically adjust said platen roller to vary the printing pressure thereof, gearing means operative to impart controlled rotative movement to said platen roller during periods of printing cooperation of the platen roller with a sheet and a printing device, and support means for gearing means movable upon adjustment of said platen roller to vary the printing pressure thereof to thereby enable the relation among the gearing means and the platen roller to be maintained and thereby insure the desired controlled rotative movement of said platen roller.

4. In a printing machine of the character described, an anvil upon which a printing device may be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing a sheet toward such a printing device to produce an impression from the device onto the sheet, said platen mechanism comprising a supporting arm extending over said anvil in spaced relation thereto, supporting means mounted on said arm over said anvil, a carriage supported and guided on said supporting means for reciprocation along a path which extends over said anvil, a platen roller, means supporting said platen roller on said carriage and operable to advance said platen roller from a retracted position with relation to said anvil to an operative printing position wherein the platen roller is operative to press a sheet toward a printing device supported on said anvil to produce an impression from said printing device onto said sheet, resilient means forming a resilient platen face on said platen roller, gearing means for imparting rotative movement

to said platen roller during and in predetermined timed relation to the reciprocative movement of said carriage so as to operatively engage said platen face with the printing device in predetermined relation, and means operable to simultaneously adjust said platen roller and all of the engaged portions of said gearing toward and away from said printing position whereby to vary the printing pressure while maintaining the same relationship between said platen roller and said gearing during adjustment of the printing pressure.

5. In a printing machine of the character described wherein a printing device is supported in printing position for the formation of a printing impression from the printing device onto a sheet, platen mechanism for pressing such a sheet toward such a printing device to produce an impression from the device onto the sheet, said platen mechanism comprising a carriage supported and guided for reciprocation along a path which extends over said printing position, a platen roller mounted on said carriage for advancing movement between a retracted position to an operative printing position wherein the platen roller is operative to press a sheet toward a printing device supported at said printing position to produce an impression therefrom, resilient means on said platen roller forming a resilient platen face thereon, gearing means for imparting rotative movement to said platen roller during and in predetermined timed relation to the reciprocative movement of said carriage so as to operatively engage said platen face with the printing device in predetermined relation, and means operable to simultaneously adjust said platen roller and all of the engaged portions of said gearing toward and away from said printing position whereby to vary the printing pressure while maintaining the same relationship between said platen roller and said gearing during adjustment of the printing pressure.

6. In a printing machine of the character described, means defining a printing position at which a printing device may be positioned, means for supporting a sheet in opposed relation to a printing device located at printing position, and platen mechanism for pressing such a sheet into printing cooperation with a printing device thus positioned, said platen mechanism comprising a supporting frame, a carriage supported and guided on said frame for reciprocation along a path which extends across said printing position, a platen roller, means supporting said platen roller on said carriage for reciprocation with said carriage and for shifting movement between a retracted inactive position and an advanced active position wherein the platen roller is operative in movement of the carriage in one direction to press a sheet into printing cooperation with a printing device at said printing position, printing pressure adjustment means operative between said frame and said carriage for adjusting the platen mechanism to vary the printing pressure exerted by said platen roller, and gearing means operable independently of and unaffected by the position of adjustment of said printing pressure adjusting means to control the rotative position of said platen roller and to impart controlled rotative movement thereto during periods of printing cooperation of the platen roller with a sheet and a printing device.

7. In a printing machine of the character described, an anvil upon which a printing device may be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing such a sheet toward such a printing device to produce an impression from the device onto the sheet, said platen mechanism comprising a supporting arm extending over said anvil in spaced relation thereto, a supporting track mounted on said arm over said anvil, a carriage supported and guided on said track for reciprocation along a path which extends over said anvil, a platen roller, means supporting said platen roller on said carriage for advancing movement of said platen roller from a retracted position with relation to said anvil to an operative printing position wherein the platen roller is operative to press a sheet toward a printing device supported on said anvil to produce an impression from said printing device onto the sheet, means operable to vertically adjust said track so as to impart like adjustment to said platen roller to vary the printing pressure thereof, and gearing means for rotating said platen roller during and as an incident to reciprocatory movement of said carriage, said gearing means comprising a plurality of intermeshed pinions one of which is rotatively interlocked with said platen roller in driving relation thereto and another of which is mounted on said carriage for vertical adjustment therewith, a rack meshed with a second one of said pinions and extending generally parallel to said path, and means supporting said rack in predetermined longitudinal relationship upon said arm and for movement substantially vertically at its point of engagement with said second one of said pinions so as to maintain the same geared relationship thereto during adjustment of the printing pressure.

8. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said mechanism comprising a supporting arm extending over said anvil in spaced relation thereto, a carriage mounted on said arm for reciprocation along a path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means operable as an incident to movement of said carriage to impart rotative movement to said platen roller in timed relation to such movement of said carriage, a primary means operable as an incident to movement of said carriage in a forward direction to shift said toggle means toward an extended relation wherein said platen roller is in said operative position, and a secondary means operable with a yielding force when said toggle means has approached relatively close to said extended relation to impart a final movement to said toggle means to said extended relation independently of the said forward movement of said carriage.

9. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said mechanism comprising

a carriage mounted for reciprocation along a path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means for rotating said platen roller in timed relation to the reciprocatory movement of said carriage, a primary means operable upon said toggle means to impart a downward movement to said platen roller, and spring means operable to supersede said primary means as said toggle means approaches its extended relation whereby to move said toggle means rapidly to a fully extended position.

10. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said mechanism comprising a carriage mounted for reciprocation along a path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means operable as an incident to movement of said carriage in one direction to shift said toggle means to an extended relation wherein said platen roller is in said operative position, means operable to latch said toggle means in said extended relation, means operable as said carriage moves in the other direction through a printing stroke to break said toggle after the desired printing has been effected, said latch means being operable upon said toggle means when said toggle means has been thus broken to accelerate the retracting movement of said platen roller toward said retracted position.

11. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said platen mechanism comprising a carriage mounted for reciprocation along a path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means operable as an incident to movement of said carriage to impart rotative movement to said platen roller in timed relation to such movement of said carriage, a primary means operable as an incident to movement of said carriage in a forward direction to shift said toggle means toward an extended relation wherein said platen roller is in said operative position, and a secondary means comprising a spring-biased cam means rendered operative as an incident to the movement of said carriage in a forward direction when said toggle means has approached relatively close to said extended relation to impart a final movement of said toggle means to said extended relation independently of the said forward movement of said carriage.

12. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said mechanism comprising a carriage mounted for reciprocation along a path extending over said anvil, a platen roller, means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means for rotating said platen roller in timed relation to the reciprocatory movement of said carriage, a primary means operable upon said supporting means in timed relation to movement of said carriage to impart a downward movement to said platen roller toward said lower operative position, and spring means operable to supersede said primary means as said platen roller approaches relatively close to said operative position whereby to move said platen roller rapidly to said operative position independently of the movement of said carriage.

13. In a printing machine, means defining a printing position at which a printing device is adapted to be supported for the performance of a printing operation, means for supporting a sheet over a printing device at said printing position, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device upon the sheet, said mechanism comprising a carriage mounted for reciprocation along a path extending over said printing position, a platen roller, means shiftably and rotatably supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced upwardly from said printing position to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device at printing position, means operable as an incident to movement of said carriage in one direction to shift said platen roller toward said lower operative position, means operable to latch said platen roller in said lower operative position, means operable as said carriage moves in the other direction through a printing stroke to release said latch means after the desired printing has been effected, said latch means being operable when thus released to accelerate the retracting movement of said platen roller toward said retracted position.

14. In a printing machine, an anvil upon which a printing device is adapted to be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing the sheet against such printing device to produce an impression from the printing device onto the sheet, said platen mechanism comprising a carriage mounted for reciprocation along a path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position wherein said platen roller is spaced up-

wardly from said anvil to a lower operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet against a printing device on said anvil, means operable as an incident to movement of said carriage to impart rotative movement to said platen roller in timed relation to such movement of said carriage, a primary means operable as an incident to movement of said carriage in a forward direction to shift said toggle means toward an extended relation wherein said platen roller is in said operative position, a secondary means comprising a spring-biased cam means mounted on said carriage and rendered operative as an incident to the movement of said carriage in a forward direction and when said toggle means has approached relatively close to said extended relation to impart a final movement to said toggle means to said extended relation independently of the said forward movement of said carriage, said spring-biased cam means being operable in rearward movement of said carriage to latch said toggle means in extended relation, and means formed in part by a portion of said primary means operable in such return movement to release said toggle means from the latching action of said spring-biased cam means.

15. In a printing machine having means providing a printing position whereat a printing device is adapted to be positioned, means for supporting a sheet in opposed relation to a printing device at said printing position, and platen mechanism for pressing the sheet into printing cooperation with such printing device to produce an impression from the printing device upon the sheet, said platen mechanism comprising a carriage mounted for reciprocation along a path extending past said printing position, a platen roller, toggle means supporting said platen roller on said carriage for movement relative to said carriage from a retracted position wherein said platen roller is spaced substantially from said anvil to an operative position wherein said platen roller is adapted to roll along the adjacent surface of the sheet to press the sheet into printing cooperation with a printing device at printing position, means operable as an incident to movement of said carriage in one direction to shift said toggle means to an extended relation wherein said platen roller is in said operative position, latch means including a latch element connected to and movable in timed relation to the extending and folding movements of said toggle means and a cooperating spring-biased latch lever operable to latch said toggle means in extended relation, and platen roller retracting means operable as said carriage moves in the other direction through a printing stroke to break said toggle after the desired printing has been effected.

16. In a printing machine, means defining a printing position at which a printing device is adapted to be supported, means for supporting a sheet over a printing device at said printing position, and platen mechanism effecting printing cooperation between a sheet and such printing device, said platen mechanism comprising a carriage mounted for reciprocation along a path extending over said printing position, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to an operative position wherein said platen roller is adapted to roll along the upper surface of the sheet to press the sheet into printing cooperation with a printing device at printing position, means operable as an incident to movement of said carriage to impart rotative movement to said platen roller in timed relation to such movement of said carriage, a primary means operable as an incident to movement of said carriage in a forward direction to shift said toggle means toward an extended relation wherein said platen roller is in said operative position, a secondary means comprising a spring-biased cam means mounted on said carriage and rendered operative as an incident to the movement of said carriage in a forward direction when said toggle means has approached relatively close to said extended relation to impart a final movement of said toggle means to said extended relation independently of the said forward movement of said carriage, said spring-biased cam means being operable in rearward movement of said carriage to latch said toggle means in extended relation, means formed in part by a portion of said primary means operable in such return movement to release said toggle means from the latching action of said spring-biased cam means, said spring-biased cam means including a cam surface operative after such release of the toggle means to urge said toggle means toward its retracted position.

17. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for reciprocating movement along the path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to a position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, an operating arm adapted to move back and forth through an operating cycle, a link connecting said operating arm to said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, a second link having a lost motion connection with said operating arm and connected to said toggle to impart a toggle-straightening movement to said toggle when said operating arm is moving said carriage in one direction, adjustable abutment means on said second link adapted to cooperate with said operating arm when said operating arm is moving in the other direction to break said toggle, and spring means operable after the toggle has been broken by said link to impart a rapid retracting movement to said platen roller.

18. A printing machine of the character described comprising means defining a printing position, an impression arm positioned over said printing position in spaced relation thereto, means for supporting a sheet at said printing position beneath said impression arm, and platen mechanism mounted on said impression arm comprising a carriage mounted for reciprocating movement along the path extending over said printing position, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to a position wherein said toggle means is extended and said platen roller is located adjacent said printing position and in position to apply printing pressure upon a sheet at said printing position, an operating arm adapted to move back and forth through an operating cycle, a link connecting

said operating arm to said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, a second link having a lost motion connection with said operating arm and connected to said toggle to impart a toggle-straightening movement to said toggle when said operating arm is moving said carriage in one direction, adjustable abutment means on said second link adapted to cooperate with said operating arm when said operating arm is moving in the other direction to break said toggle, and spring means operable after the toggle has been broken by said link to impart a rapid retracting movement to said platen roller.

19. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for reciprocating movement along the path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to a position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, an operating arm adapted to move back and forth through an operating cycle, a link connecting said operating arm to said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, and a second link having a lost motion connection with said operating arm and connected to said toggle to impart a toggle-straightening movement to said toggle when said operating arm is moving said carriage in one direction.

20. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for reciprocating movement along the path extending over said anvil, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to a position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, an operating arm adapted to move back and forth through an operating cycle, a link connecting said operating arm to said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, a second link having a lost motion connection with said operating arm and connected to said toggle to impart a toggle-straightening movement to said toggle when said operating arm is moving said carriage in one direction, and adjustable abutment means on said second link adapted to cooperate with said operating arm when said operating arm is moving in the other direction to break said toggle.

21. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for movement along the path extending over said anvil through a forward stroke and a rearward or return stroke, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to an advanced active position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, driving means located rearwardly of said carriage and operable to impart reciprocating movement to said carriage, control means also located rearwardly of the forward edge of said carriage and connected to said toggle to impart a toggle-straightening movement to said toggle when said driving means is moving said carriage in one direction, adjustable means on said control means adapted to cooperate with said driving means when said operating arm is moving in the other direction to break said toggle, and spring means operable after the toggle has been broken by said link to impart a rapid retracting movement to said platen roller.

22. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for movement along the path extending over said anvil through a forward stroke and a rearward or return stroke, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to an advanced active position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, driving means located rearwardly of said carriage and operable to impart reciprocating movement to said carriage, and control means also located rearwardly of the forward edge of said carriage and connected to said toggle to impart a toggle-straightening movement to said toggle when said driving means is moving said carriage in one direction.

23. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm comprising a carriage mounted for movement along the path extending over said anvil through a forward stroke and a rearward or return stroke, a platen roller, toggle means supporting said platen roller on said carriage for movement from a retracted position to an advanced active position wherein said toggle means is extended and said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over the anvil, driving means located rearwardly of said carriage and operable to impart reciprocating movement to said carriage, control means also located rearwardly of the forward edge of said carriage and connected to said toggle to impart a toggle-straightening movement to said toggle when said driving means is moving said carriage in one direction, and adjustable means on said control means adapted to cooperate with said driving means when said operating arm is moving in the other direction to break said toggle.

24. In a printing machine of the character described, a frame having a printing position at which a printing device may be positioned, means

for supporting a sheet in an operative relationship to a printing device at said printing position, and platen means for effecting printing cooperation between such a sheet and such a printing device comprising a platen carriage, means providing a track along which said platen carriage may be reciprocated, a platen roller having a plurality of different faces disposed thereabout in different arcuate sectors of the periphery of the platen roller, said different platen faces having different impression-forming characteristics, means supporting said platen roller rotatably upon said platen carriage for shifting movement from a retracted inactive position to an advanced active position wherein one of said platen faces may be rolled across a sheet in printing cooperation therewith, means for initially determining the rotative position of said platen roller with relation to said printing position including gearing means having an initial member shiftable between a plurality of positions, said gearing means being operable in response to the location of said initial member in different ones of said positions to render different ones of said platen faces effective in a printing operation, and means for shifting said initial member between its said positions.

25. In a printing machine of the character described, a frame having a printing position at which a printing device may be positioned, means for supporting a sheet in an operative relationship to a printing device at said printing position, and platen means for effecting printing cooperation between such a sheet and such a printing device comprising a platen carriage, a supporting frame member and means including a track supported on said frame member and along which said platen carriage may be reciprocated, a platen roller having a plurality of platen faces disposed thereabout in different arcuate sectors of the periphery of the platen roller, different ones of said platen faces having different impression-forming characteristics, means supporting said platen roller rotatably upon said platen carriage for advancing movement to an active position wherein one of said platen faces may be rolled across a sheet in printing cooperation therewith, means for initially determining the rotative position of said platen roller with relation to said printing position including gearing means having a terminal pinion drivingly connected to said platen roller, at least one secondary pinion mounted on a fixed axis on said carriage and drivingly connected to said terminal pinion, and an initial member comprising a rack disposed substantially parallel to said track and meshed with said secondary pinion, means supporting said rack on frame member for shifting movement between a plurality of positions, said gearing means being operable in response to the location of said rack in different ones of said positions to render different ones of said platen faces effective in a printing operation, and means for shifting said rack between its said positions and for releasably holding the rack in any one of said positions.

26. In a printing machine of the character described, means defining a printing position at which a printing device may be supported, means for supporting a sheet in opposed relation to such a printing device at said printing position, platen means for pressing such a sheet into printing cooperation with such a printing device, said platen means comprising a carriage mounted for reciprocatory movement across said printing position, a platen roller having a plurality of different platen faces disposed in different arcuate segments about its periphery with each of said platen faces having different impression-forming characteristics, means supporting said platen roller on said carriage for advancing movement from a retracted position to an active position adjacent said printing position, driving means for imparting rotative movement to said platen roller during reciprocation of said carriage, said driving means being adjustable to any one of a plurality of relationships to said platen roller, in each of which relationships said driving means renders a different one of said platen faces effective in a printing operation, means for shifting said driving means to any one of said relationships, and means operable to adjust the printing pressure applied by said platen roller independently of said driving means.

27. A printing machine of the character described comprising means defining a printing position at which a printing device may be supported, means for supporting a sheet in opposed relation to such a printing device at said printing position, platen means for pressing such a sheet into printing cooperation with such a printing device, said platen means comprising a carriage mounted for reciprocatory movement across said printing position, a platen roller having a plurality of different platen faces disposed in different arcuate segments about its periphery with each of said platen faces having different impression-forming characteristics, means supporting said platen roller on said carriage for advancing movement from a retracted inactive position to an active position adjacent said printing position, driving means for imparting rotative movement to said platen roller during reciprocation of said carriage, said driving means being adjustable to any one of a plurality of relationships with respect to said platen roller, in each of which relationships said driving means renders a different one of said platen faces effective in a printing operation, means operable upon platen roller supporting means to advance the platen roller from its inactive to its active position, and platen face selecting means operable to adjust said driving means to any one of said relationships and thereby to select the platen face which is to be operative in a printing stroke of said platen roller.

28. A series printing machine of the character described through which printing devices having a plurality of lines of type matter are adapted to be sequentially passed, means defining a printing position at which such printing devices may be successively positioned for the performance of a plurality of printing operations from each of such devices, and platen mechanism for performing such a plurality of printing operations from each printing device comprising a platen carriage, a track supporting said carriage for reciprocatory movement across said printing position, a platen roller having a plurality of effective platen faces each formed to print a different portion of the type matter from a printing device, means supporting said platen rotatably upon said carriage, means including a gear train the terminal member of which is rotatively interlocked with said platen roller for rotating said platen roller during a printing operation, said gear train including an initial member mounted for shifting movement between a plurality of positions, in each of which positions said initial member conditions said gear train to

render a different one of said platen faces effective in a printing operation, and automatic means operable to shift said initial member of said gear train to different ones of said positions in predetermined sequence whereby to render said different platen faces effective to form printing impressions from different portions of the type matter of a printing device in the plurality of printing operations performed from each such printing device.

29. A series printing machine of the character described through which printing devices having a plurality of lines of type matter are adapted to be sequentially passed, means defining a printing position at which such printing devices may be successively positioned for the performance of a plurality of printing operations from each of such devices, and platen mechanism for performing such a plurality of printing operations from each printing device comprising a platen carriage, a track supporting said carriage for reciprocatory movement across said printing position, a platen roller having a plurality of effective platen faces each formed to print a different portion of the type matter from a printing device, means supporting said platen rotatably upon said carriage for movement between an inactive retracted position and an advanced active position wherein said platen roller is operative to produce a printing impression, means including a gear train the terminal member of which is rotatably interlocked with said platen roller for rotating said platen roller during a printing operation, said gear train including an initial member mounted for shifting movement between a plurality of positions, in each of which positions said initial member conditions said gear train to render a different one of said platen faces effective in a printing operation, and automatic means operable as an incident to movement of said carriage to shift said initial member of said gear train to different ones of said positions in predetermined sequence whereby to render said different platen faces effective on different portions of said type matter on a printing device in the plurality of printing operations performed from each such printing device.

30. In a printing machine of the character described, means defining a printing position at which a printing device may be supported, means for supporting a sheet in opposed relation to such a printing device at said printing position, platen means for pressing such a sheet into printing cooperation with such a printing device, said platen means comprising a carriage mounted for reciprocatory movement across said printing position, a platen roller having a plurality of different platen faces disposed in different arcuate segments about its periphery with each of said platen faces having different impression-forming characteristics, means supporting said platen roller on said carriage for advancing movement from a retracted position to an active position adjacent said printing position, driving means for imparting rotative movement to said platen roller during reciprocation of said carriage, said driving means being adjustable to any one of a plurality of relationships to said platen roller, in each of which relationships said driving means renders a different one of said platen faces effective in a printing operation, means for reciprocating said carriage, and means actuated by said reciprocating means operable automatically to shift said driving means between its several relationships in predetermined sequence and in timed relation to the operation of said reciprocating means.

31. In a printing machine of the character described, means defining a printing position at which a printing device may be supported, means for supporting a sheet in opposed relation to such a printing device at said printing position, platen mechanism for pressing such a sheet into printing cooperation with such a printing device, said platen mechanism comprising a carriage mounted for reciprocatory movement across said printing position, a platen roller having a plurality of different platen faces disposed in different arcuate segments about its periphery with each of said platen faces having different impression-forming characteristics, means supporting said platen roller on said carriage for advancing movement from a retracted position to an active position adjacent said printing position, driving means for imparting rotative movement to said platen roller during reciprocation of said carriage, said driving means being adjustable to any one of a plurality of relationships to said platen roller, in each of which relationships said driving means renders a different one of said platen faces effective in a printing operation, means for reciprocating said carriage, actuating means operated by said reciprocating means and operable automatically to shift said driving means between its several relationships in predetermined sequence and in timed relation to the operation of said reciprocating means, and manually operable means for disabling said actuating means.

32. In a printing machine of the character described, means defining a printing position at which a printing device may be supported, means for supporting a sheet in opposed relation to such a printing device at said printing position, platen means for pressing such a sheet into printing cooperation with such a printing device, said platen means comprising a carriage mounted for reciprocatory movement across said printing position through an idle conditioning stroke in one direction and an operative printing stroke in the other direction, a platen roller having a plurality of different platen faces disposed in different arcuate segments about its periphery with each of said platen faces having different impression-forming characteristics, means supporting said platen roller on said carriage for advancing movement from a retracted inactive position to an active position adjacent said printing position, driving means for imparting rotative movement to said platen roller during reciprocation of said carriage, said driving means being adjustable to any one of a plurality of relationships with respect to said platen roller, in each of which relationships said driving means renders a different one of said platen faces effective in a printing operation, means operable upon platen roller supporting means to advance the platen roller during said idle stroke from its inactive position to its active position, platen face selecting means for shifting said driving means to any one of said relationships, and means operable upon said platen face selecting means during said idle stroke to effect automatic selection of said platen faces in predetermined sequence.

33. A printing machine of the character described comprising a frame having a printing position at which a printing device may be positioned, means for supporting a sheet in an operative relationship to a printing device at

said printing position, and platen means for effecting printing cooperation between such a sheet and such a printing device comprising a platen carriage, a supporting frame member upon which said platen carriage is reciprocably mounted, a platen roller having a plurality of different faces disposed thereabout in different arcuate sectors of the periphery of the platen roller, said different platen faces having different impression-forming characteristics, means supporting said platen roller rotatably upon said platen carriage for advancing from an inactive retracted position to an active position wherein one of said platen faces may be rolled across a sheet in printing cooperation therewith, means for initially determining the rotative position of said platen roller with relation to said printing position including gearing means having a terminal pinion drivingly connected to said platen roller, at least one secondary pinion mounted on a fixed axis on said carriage and drivingly connected to said terminal pinion, and an initial member comprising a rack disposed substantially parallel to said track and meshed with said secondary pinion, means supporting said rack on frame member for shifting movement between a plurality of positions, said gearing means being operable in response to the location of said rack in different ones of said positions to render different ones of said platen faces effective in a printing operation, and means for shifting said rack between its said positions comprising spring means urging said rack in one direction and shiftable cam means operable against said spring means for urging said rack in the other direction, and means operable in timed relation to the reciprocation of said carriage for shifting said cam means.

34. In a printing machine of the character described, an anvil upon which a printing device may be supported, means for supporting a sheet over a printing device on said anvil, and platen mechanism for pressing such a sheet toward such a printing device to produce a printing impression from the device onto the sheet, said platen mechanism comprising a supporting arm having a mounting head thereon positioned over said anvil in spaced relation thereto, a platen carriage, a supporting plate including a track beneath and upon which said carriage is reciprocably mounted, means mounting said supporting plate on the lower surface of said mounting head and operable to urge said plate upwardly with a resilient force toward the lower surface of said head, adjustable means for limiting such upward movement of said plate, a platen roller, means supporting said platen roller on said carriage for advancing movement of said platen roller from a retracted position with relation to said anvil to an operative printing position wherein the platen roller is operative to press a sheet toward a printing device supported on said anvil to produce a printing impression from said printing device on said sheet, gearing means for rotating said platen roller during and as an incident to reciprocatory movement of said carriage, said gearing means comprising a plurality of inter-meshed pinions one of which is rotatively interlocked with said platen roller in driving relation thereto and another of which is mounted on said carriage for vertical adjustment therewith, a rack meshed with a second one of said pinions and extending generally parallel to said path, and means supporting said rack in predetermined longitudinal relationship upon said arm and for movement substantially vertically at its point of engagement with said second one of said pinions so as to maintain the same geared relationship thereto during vertical adjustment of said printing pressure, and manually actuatable means operable upon said adjustable means to verticaly adjust said supporting plate so as to impart like adjustment to said platen roller to vary the printing pressure thereof.

35. In a printing machine of the character described, means defining a printing position at which a printing device may be positioned, means for supporting a sheet over a printing device at printing position, and platen mechanism for pressing such a sheet into printing cooperation with a printing device thus positioned, said platen mechanism comprising a supporting frame, a platen carriage, a support plate having a track beneath and upon which said carriage is reciprocably mounted, means mounting said plate on said frame to guide said carriage for reciprocation along a path which extends across said printing position, said last mentioned means serving to guide said plate for limited vertical adjusting movement and including resilient means operable to urge said plate upwardly, means operable to control such resiliently induced upward movement including a plurality of levelling screws extending upwardly from said plate and having abutment nuts thereon for engagement with downwardly facing surfaces on said frame to limit such upward movement, means for individually adjusting the rotative positions of said levelling screws while permitting longitudinal movement thereof, means including a non-reversing actuating drive operable to adjust the rotative positions of said nuts in unison, a platen roller, and means supporting said platen roller on said carriage for reciprocation with said carriage and for shifting movement between a retracted inactive position and an advanced active position wherein the platen roller is operative in movement of the carriage in one direction to press a sheet into printing cooperation with a printing device at said printing position.

36. In a printing machine of the character described, means defining a printing position at which a printing device may be positioned, means for supporting a sheet over a printing device at printing position, and platen mechanism for pressing such a sheet into printing cooperation with a printing device thus positioned, said platen mechanism comprising a supporting frame having a lower surface and a readily accessible upper surface, a platen carriage, a support plate having a track beneath and upon which said carriage is reciprocably mounted, means mounting said plate on said frame to guide said carriage for reciprocation along a path which extends across said printing position, said last mentioned means including resilient means operable to urge said plate upwardly, means operable to control such resiliently induced upward movement including a plurality of levelling screws extending upwardly from said plate and having abutment nuts thereon for engagement with downwardly facing surfaces on said frame to limit such upward movement, means accessible for manipulation on said upper surface of said frame for individually adjusting the rotative positions of said levelling screws while permitting longitudinal movement thereof, means operable to adjust the rotative positions of said nuts in unison, and a platen roller supported on said carriage for re-

ciprocation with said carriage and for shifting movement between a retracted inactive position and an advanced active position wherein the platen roller is operative in movement of the carriage in one direction to press a sheet into printing cooperation with a printing device at said printing position.

37. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and platen mechanism mounted on said impression arm and comprising a carriage mounted for reciprocating movement along a path extending over said anvil, a platen roller, means supporting said platen roller on said carriage for advancing movement from an inactive retracted position to an advanced active position wherein said platen roller is located adjacent said anvil and in position to apply printing pressure upon a sheet positioned over said anvil, an operating arm adapted to move back and forth through an operating cycle, a link connecting said operating arm to said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, a second link having a lost motion connection with said operating arm, platen roller control means operatively associated with the means supporting said platen roller for imparting movement to said platen roller between said retracted position and said active position, said platen roller control means being operatively connected to said second link for actuation thereby in the course of the operating cycle of said arm.

38. A printing machine of the character described comprising an anvil, an impression arm positioned over said anvil in spaced relation thereto, means for supporting a sheet beneath said impression arm and over said anvil, and a platen mechanism mounted on said impression arm and comprising a carriage mounted for reciprocating movement along a path extending over said anvil, a platen roller supported on said carriage for movement from a retracted inactive position to an advanced active position wherein said platen roller is located adjacent said anvil and in a position to apply printing pressure upon a sheet positioned over said anvil, an operating arm adapted to move back and forth through an operating cycle, a link connected to said operating arm and said carriage to impart reciprocating movement to said carriage in an operating cycle of said arm, platen roller actuating means for shifting said platen roller back and forth between said positions, a second link having one end connected to said platen roller actuating means and having a lost motion connection with said operating arm to impart movement to said platen roller from said inactive position to said active position when said operating arm is moving said carriage in one direction, adjustable abutment means on said second link adapted to cooperate with said operating arm when said operating arm is moving in the other direction to initiate movement of said platen roller from said active position toward said inactive position, and spring means operable after such movement of the platen roller from its active position has been initiated to impart a rapid retracting movement to said platen roller.

39. In a printing machine of the character described, a frame having a printing position at which a pinting device may be positioned, means for supporting a sheet in an operative relationship to a printing device at said printing position, and platen means for effecting printing cooperation between such a sheet and such a printing device comprising a platen carriage, means providing a track along which said platen carriage may be reciprocated, a platen roller having a plurality of different faces disposed thereabout in different arcuate sectors of the periphery of the platen roller, said different platen faces having different impression-forming characteristics, means supporting said platen roller rotatably upon said platen carriage for shifting movement from a retracted inactive position to an advanced active position wherein one of said platen faces may be rolled across a sheet in printing cooperation therewith, means operable to initially determine the rotative position of said platen roller with respect to said printing position including gearing means having a plurality of gearing elements connected in a gear train originating in a normally fixed gearing element and terminating in a gearing element in predetermined driving relation to said platen roller, one of said gearing elements being shiftable to any selected one of a plurality of different relationships with respect to the other gearing elements, said gearing means being operable in response to the establishment of different ones of said relationships to render different ones of said platen faces effective in a printing operation, and means for establishing said different relationships selectively.

40. In an addressing machine, a frame having a printing area, a carriage pivoted to swing to and from a printing position, means to lock the carriage when it is swung to a printing position, spring means urging the locking means to a locking position, when the carriage is swung to a printing position, a printing roller, means to roll the roller across the printing area, and a slidably mounted member connected to the carriage and engageable with a movable part of the roller rolling means to be slid thereby to move the locking means to an unlocking position, against the action of the spring means, substantially at the end of the printing operation.

41. In an addressing machine, a frame having a printing area, a carriage pivoted to swing to and from a printing position, means to lock the carriage when it is swung to a printing position, spring means urging the locking means to a locking position, when the carriage is swung to a printing position, a printing roller, means to roll the roller across the printing area, and a slidably mounted member connected to the carriage and arranged to be slid by movement of the roller rolling means, said member being arranged for its sliding movement to move the locking means to an unlocking position, against the action of the spring means, substantially at the end of the printing operation.

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