Oct. 10, 1944. C. J. HUEBER 2,359,850

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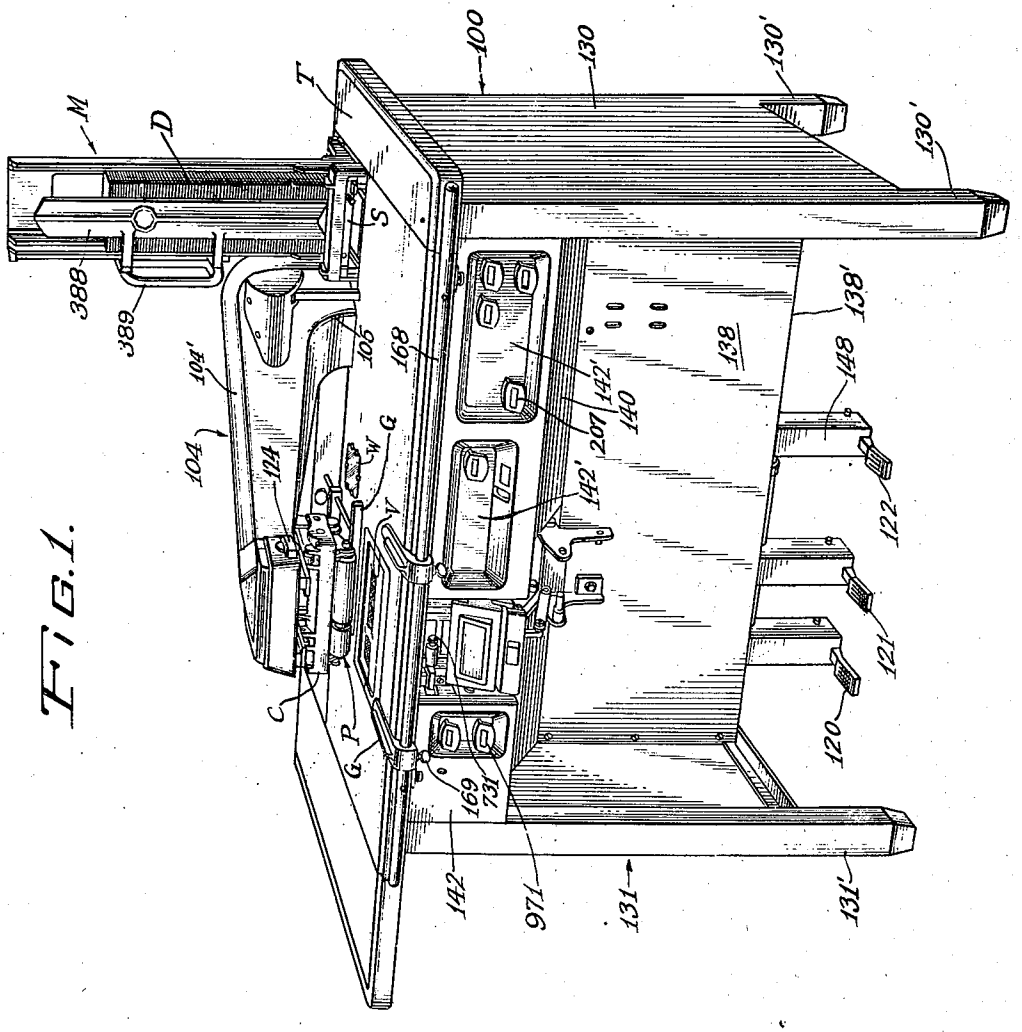


FIG. 1.

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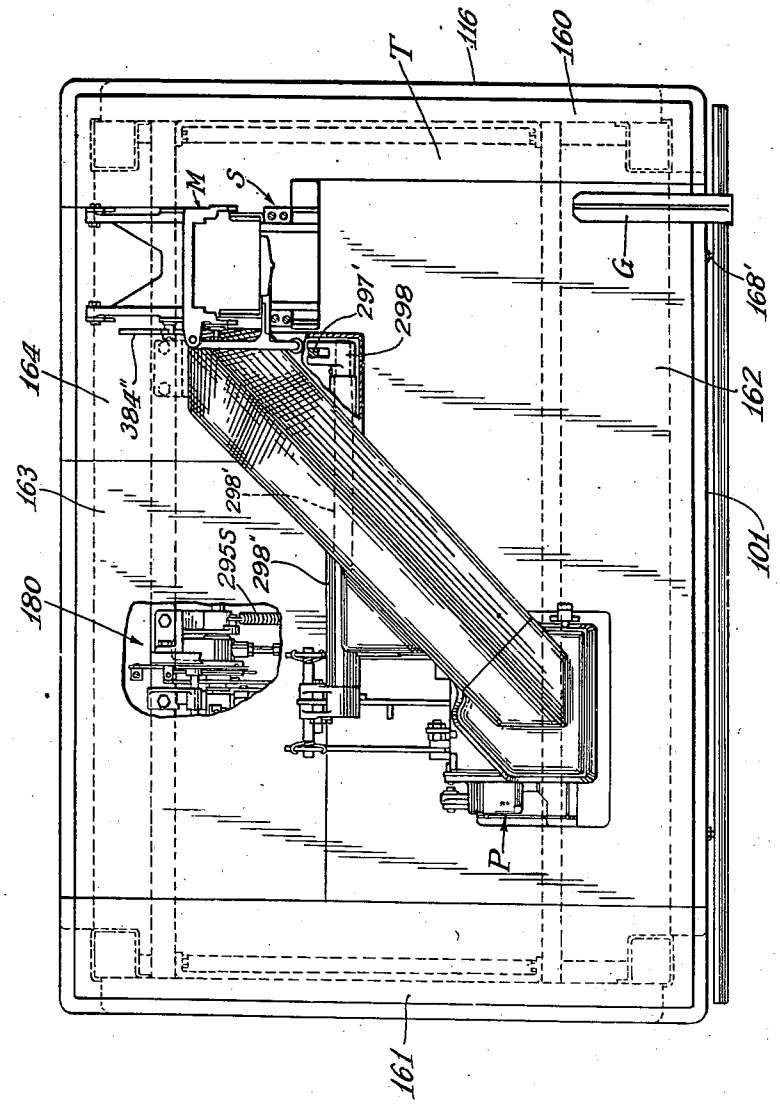


FIG. 2.

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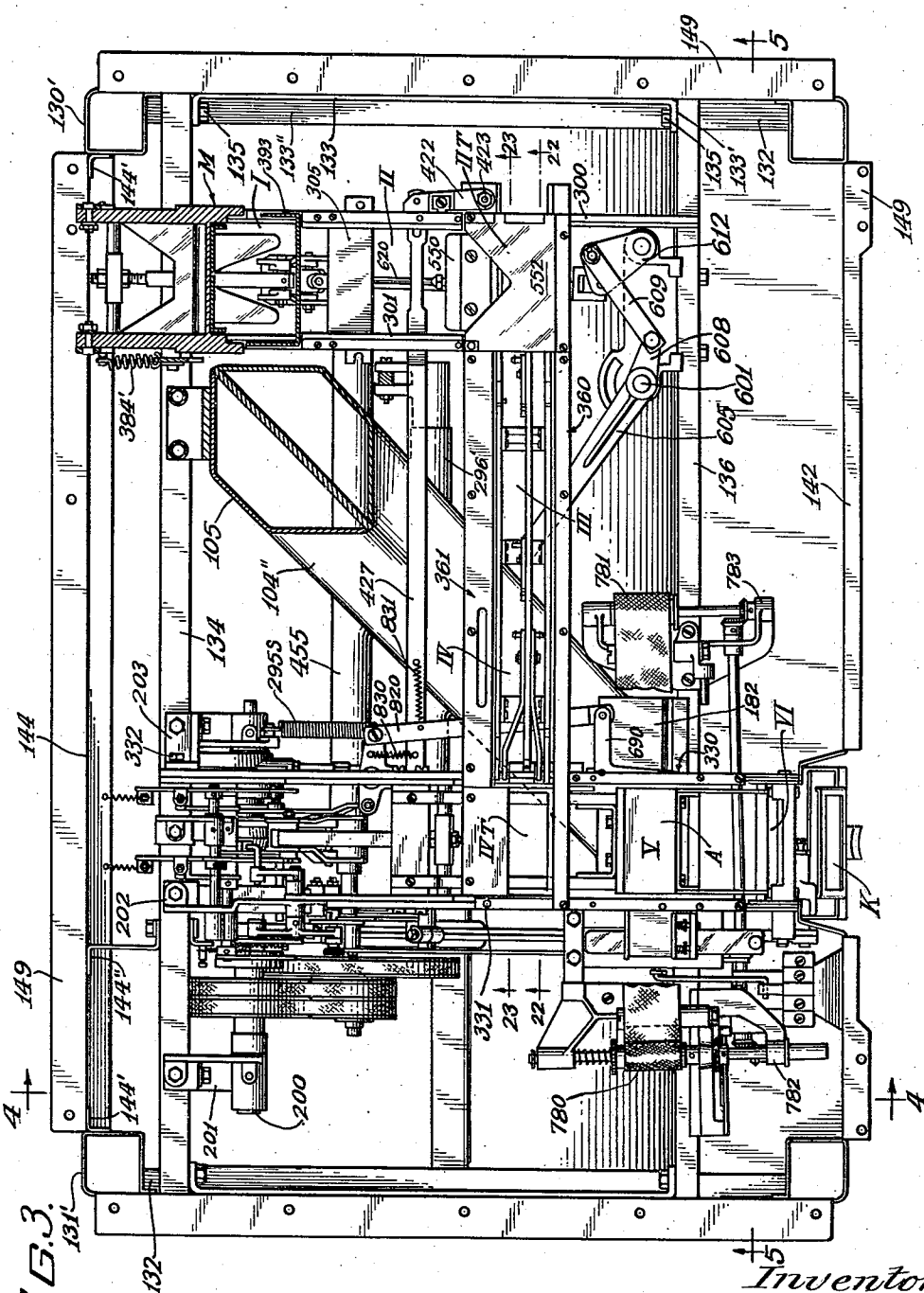


FIG. 3.

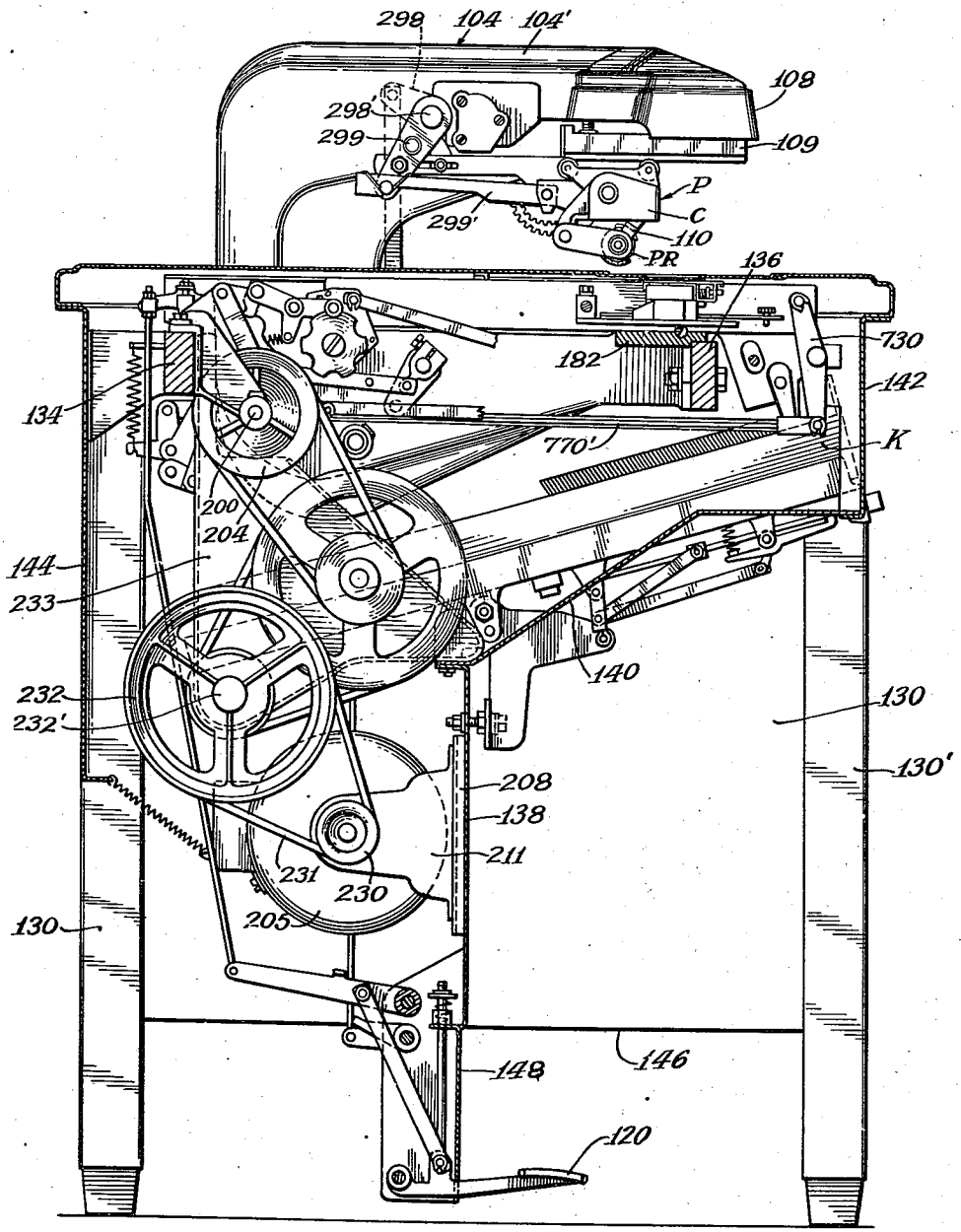
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FIG. 4.



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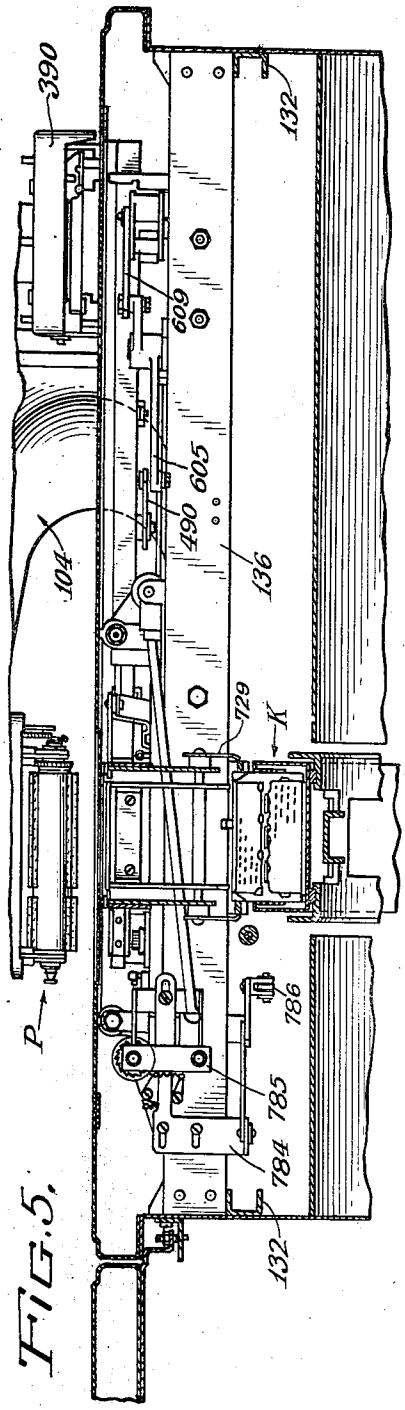


FIG. 5.

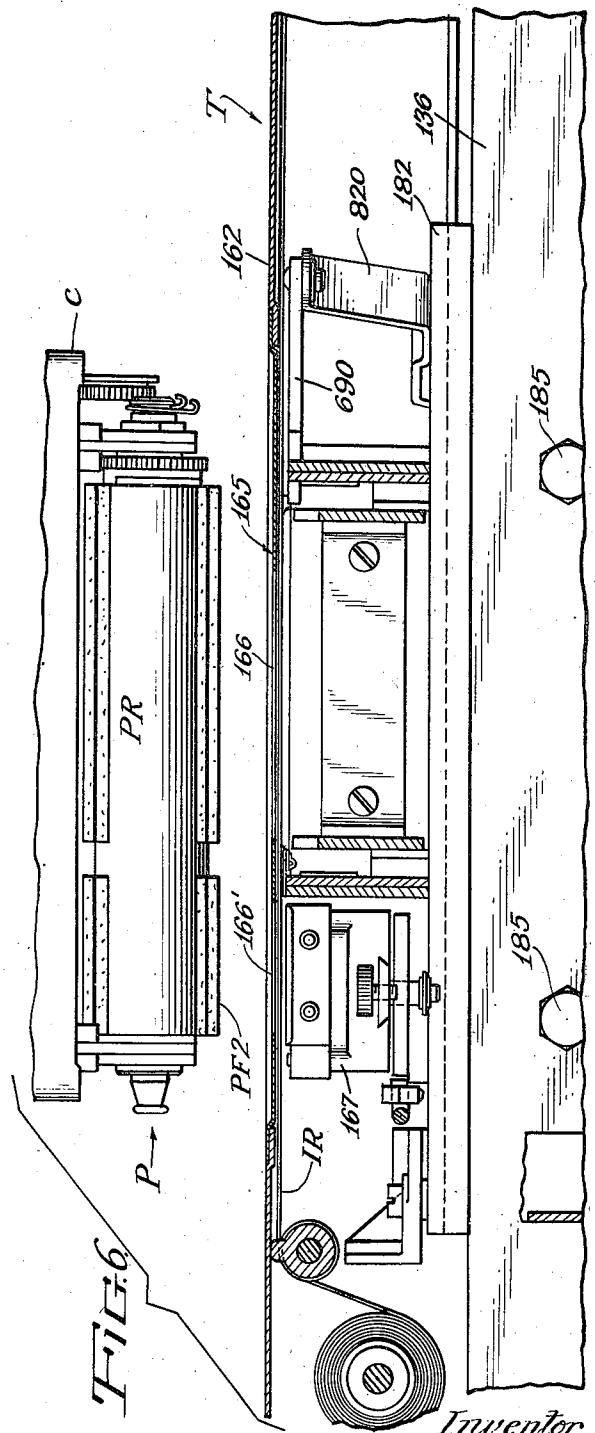


FIG. 6.

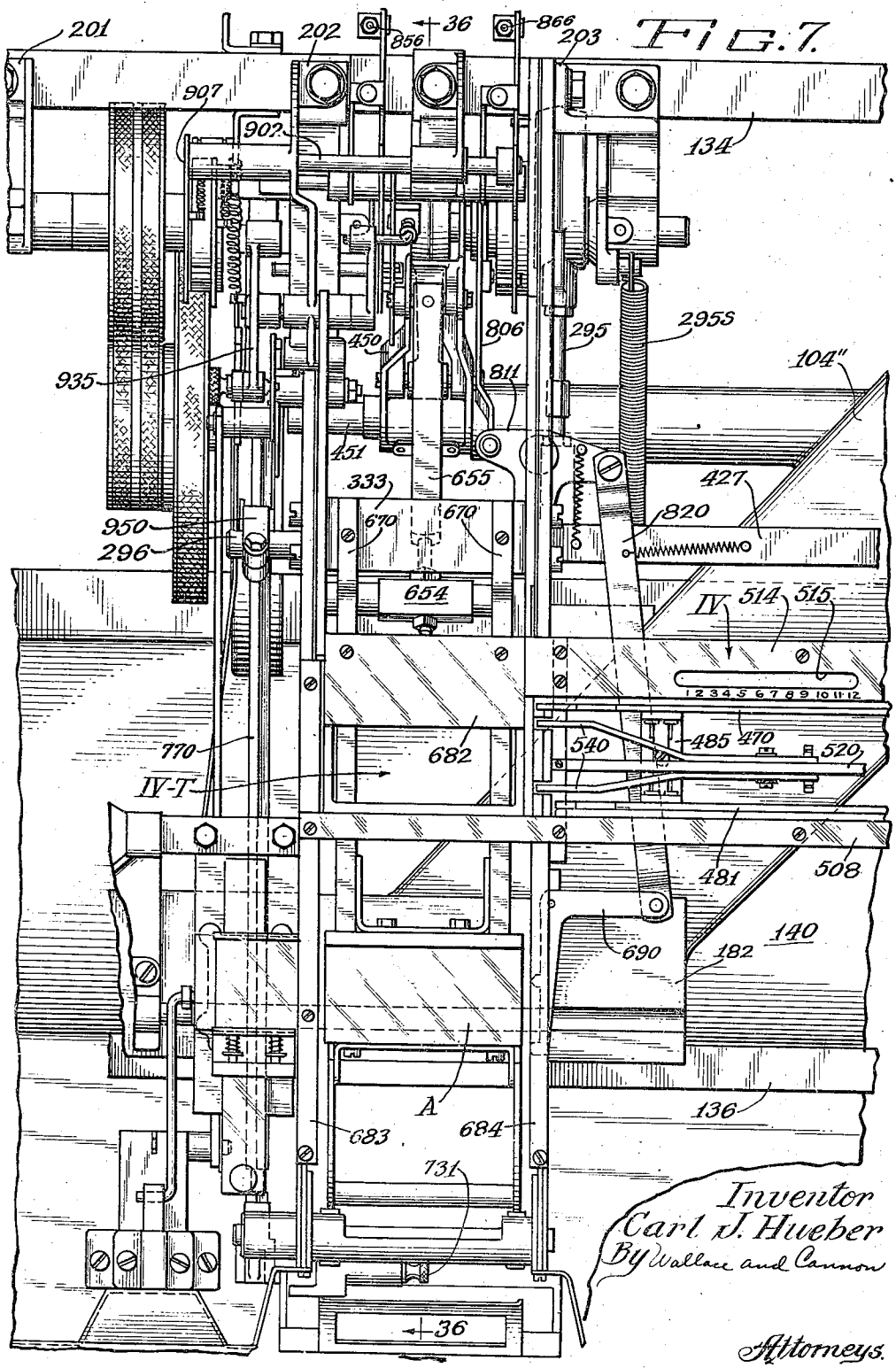
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FIG. 7.



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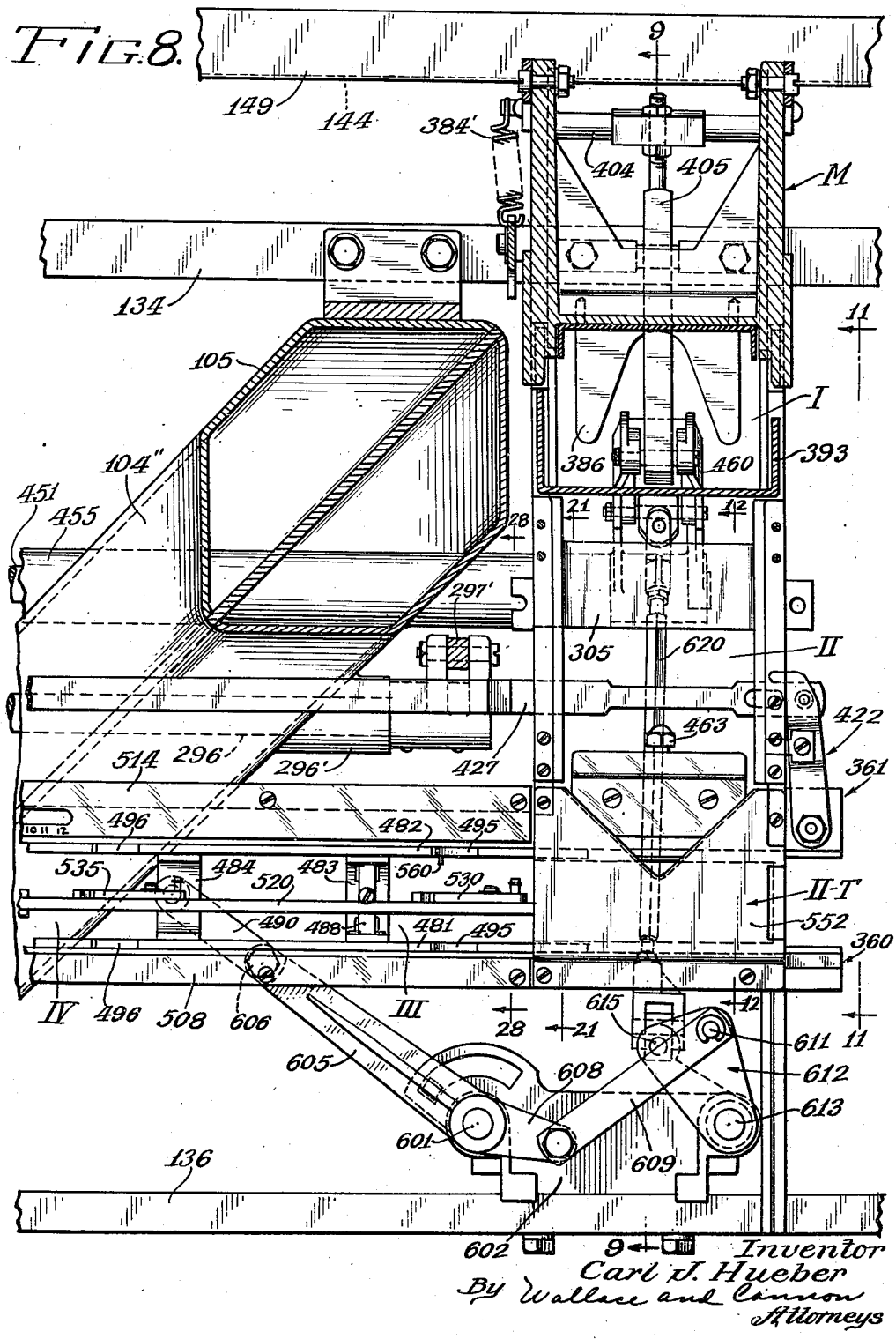
Attorneys.

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FIG. 8.



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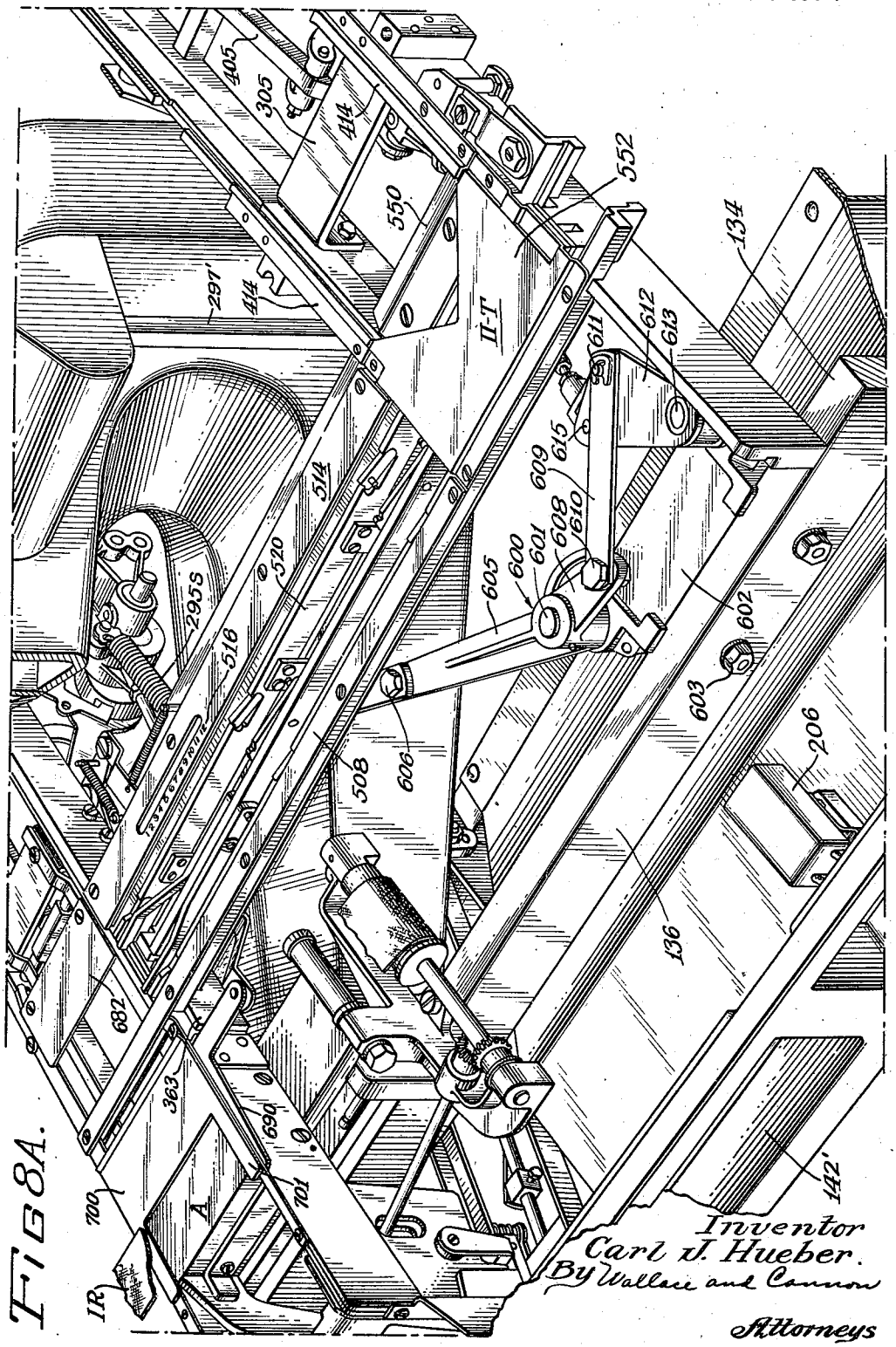


FIG 84.

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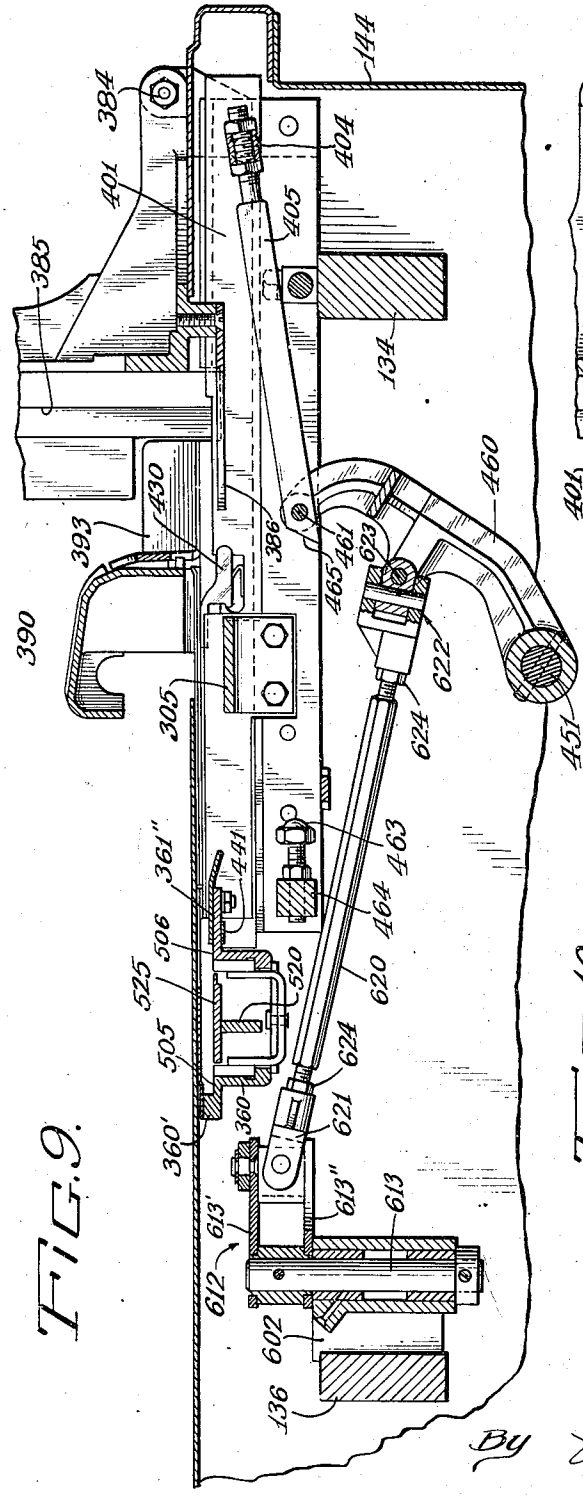


FIG. 9.

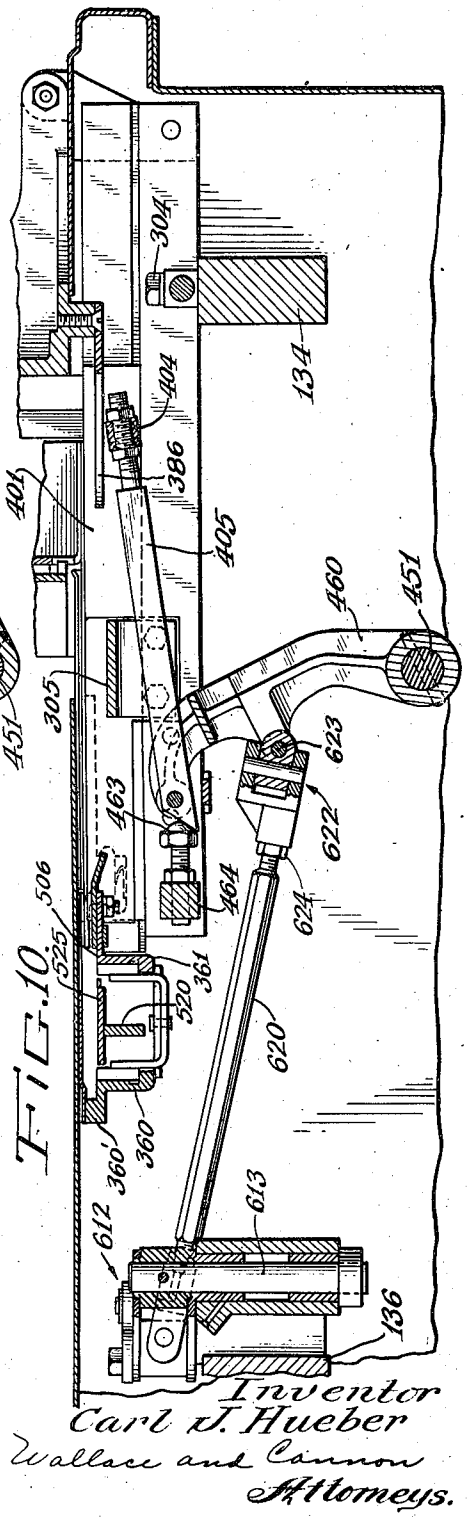


FIG. 10.

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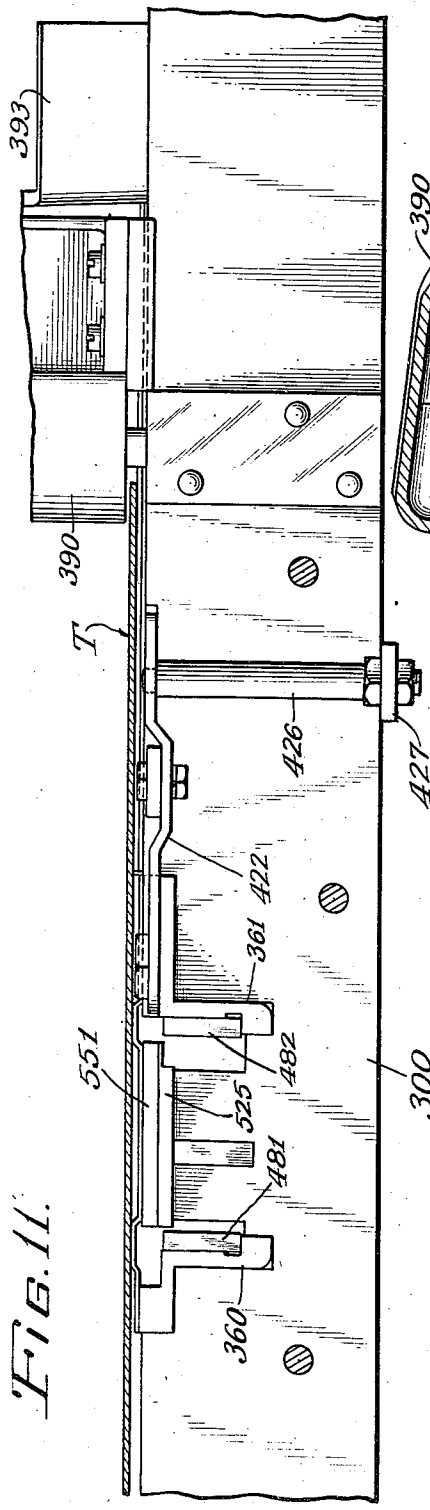


FIG. 11.

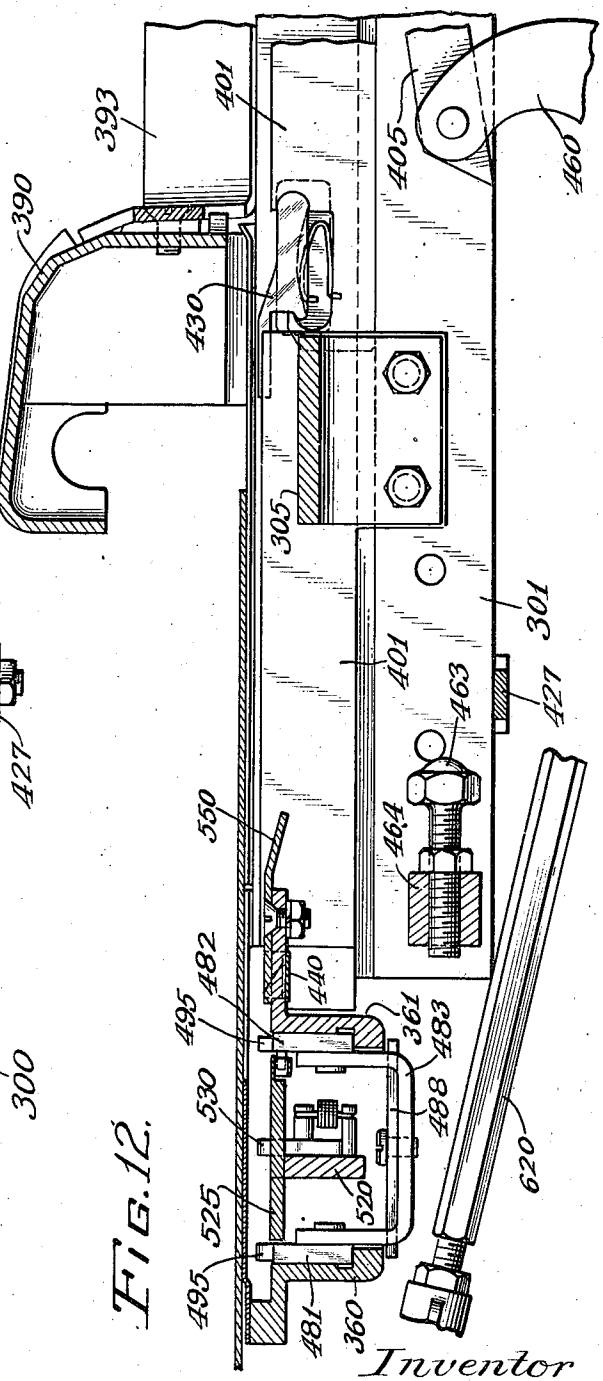


FIG. 12.

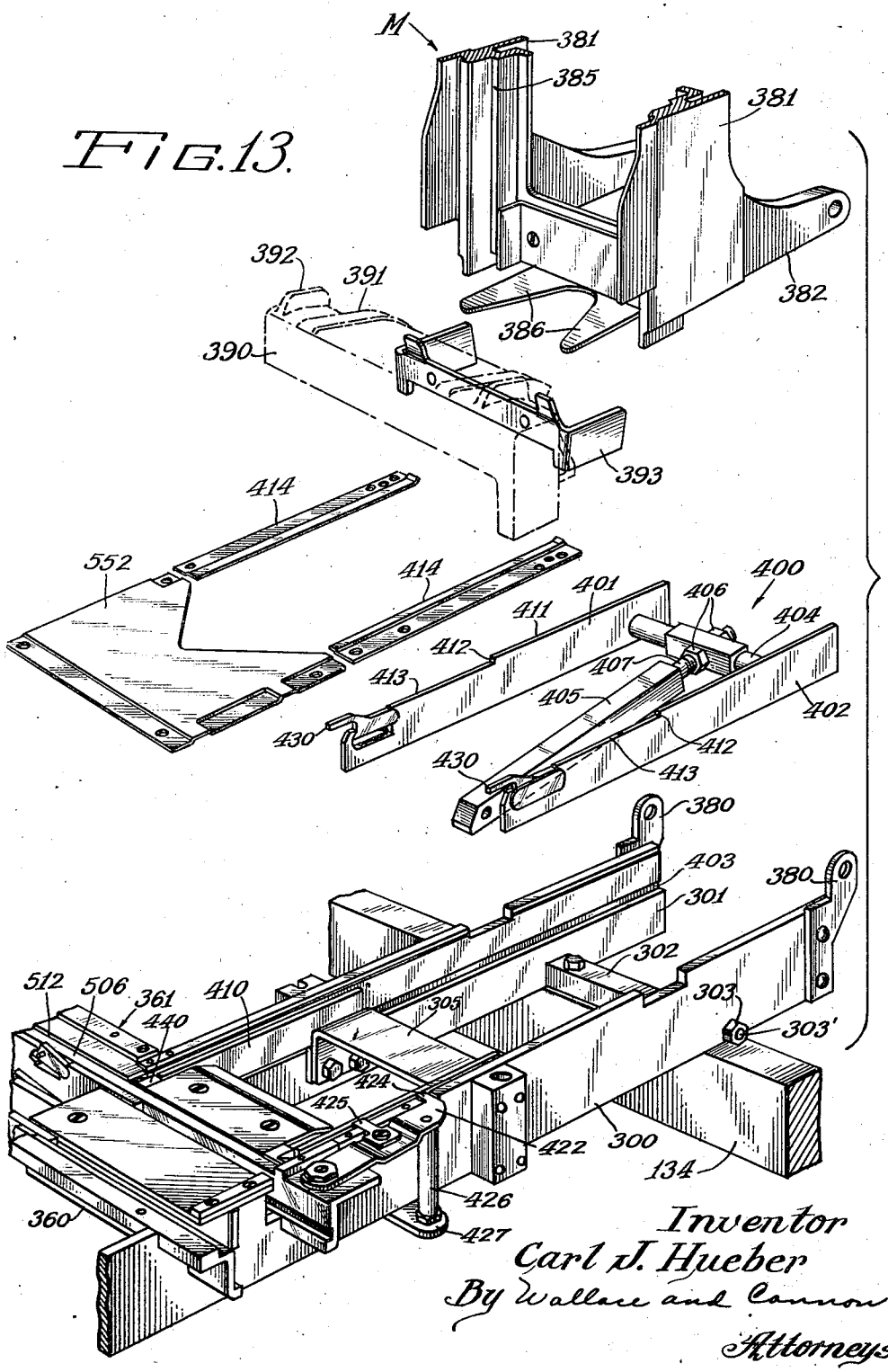
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FIG. 13.



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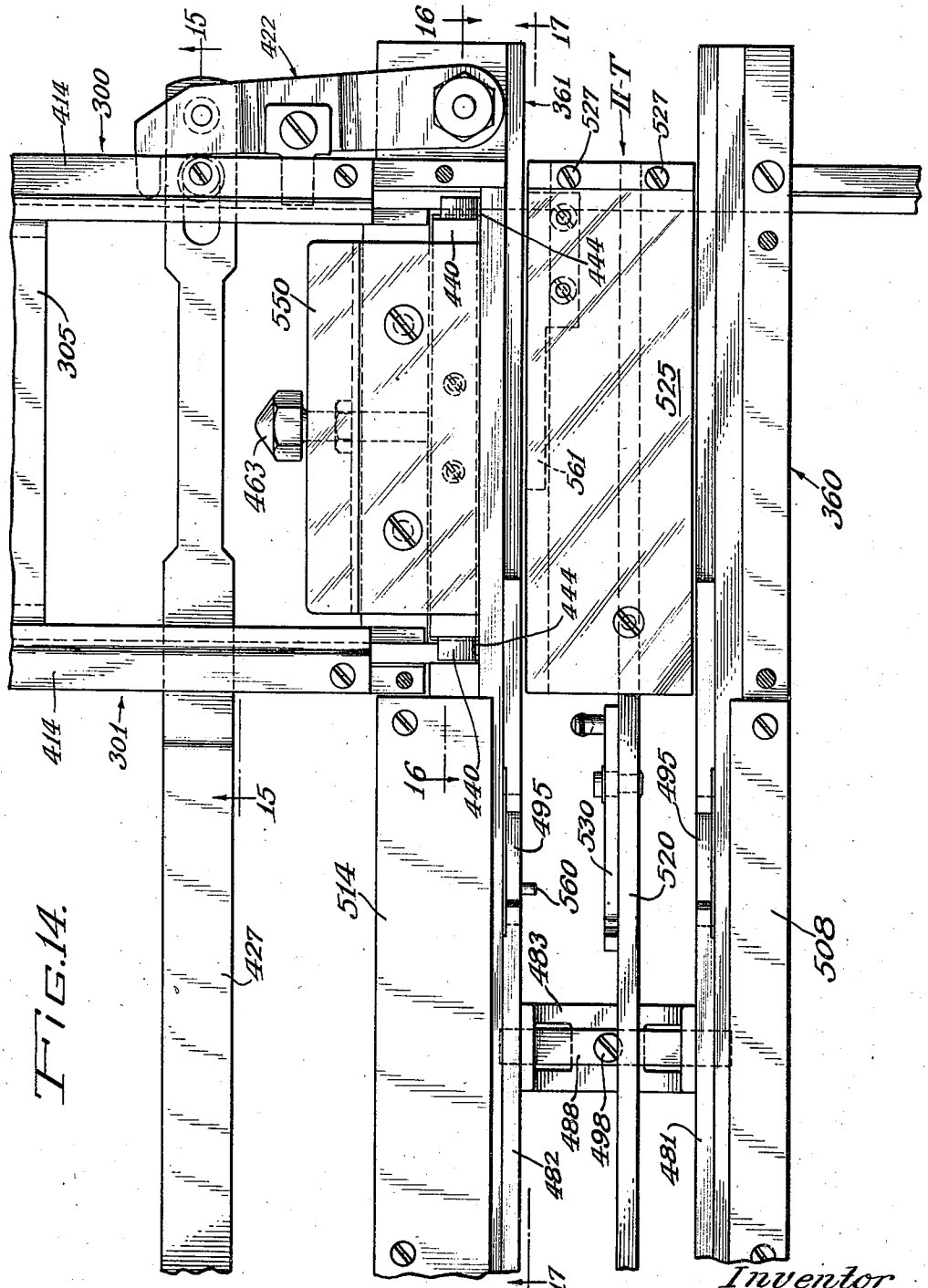


FIG. 14.

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Fig. 15.

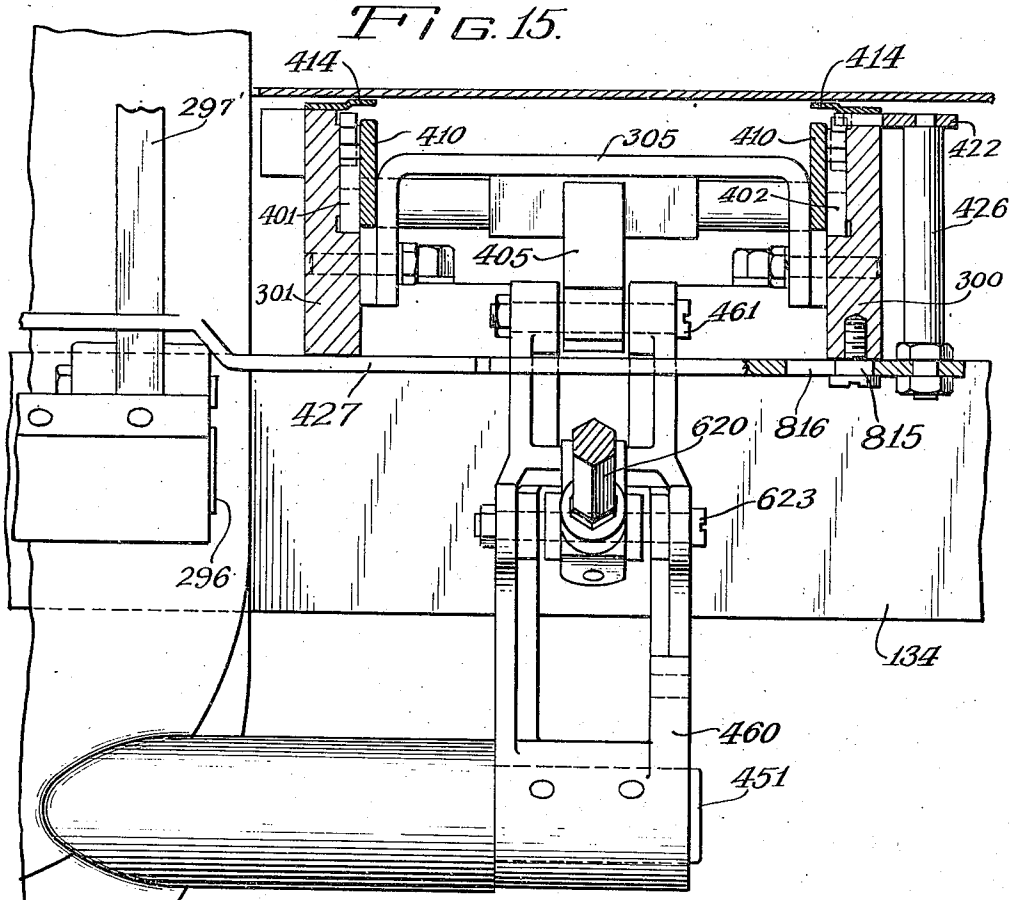
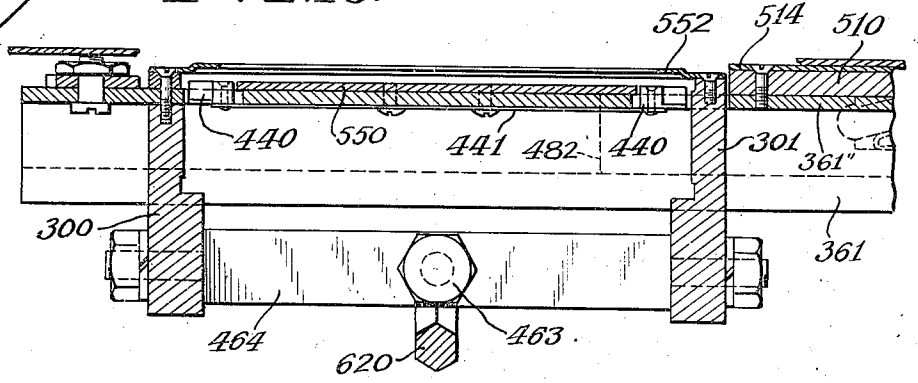


Fig. 16.



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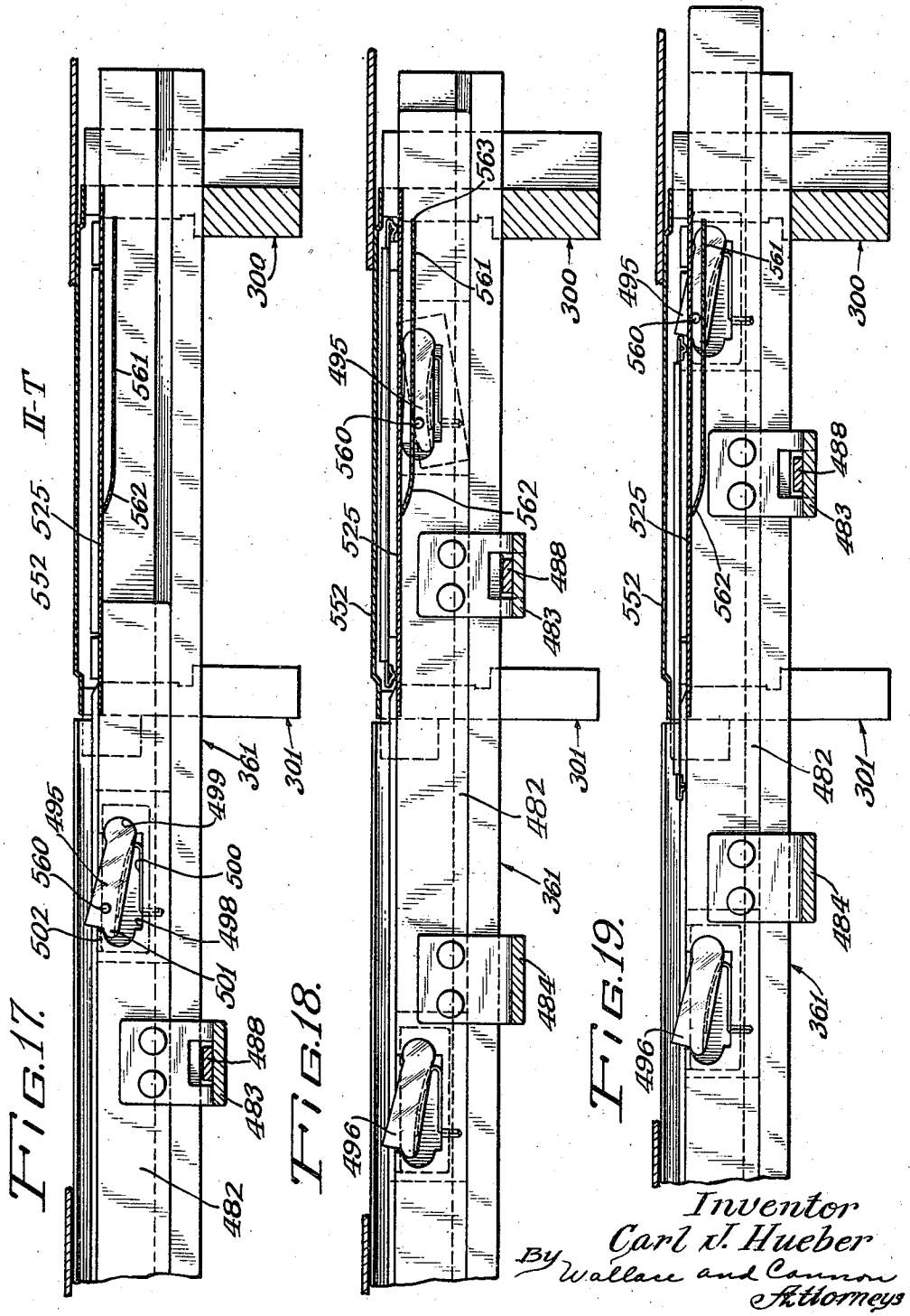


FIG. 17.

FIG. 18.

FIG. 19.

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FIG. 20.

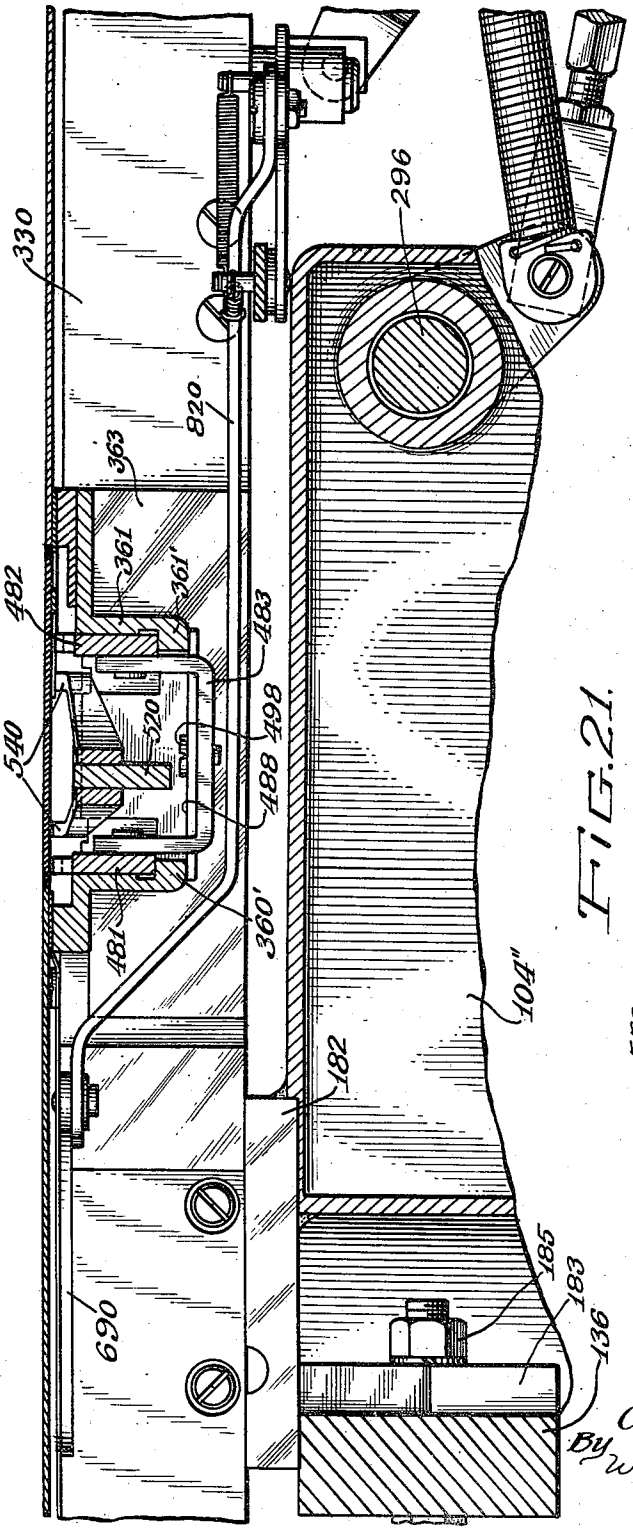
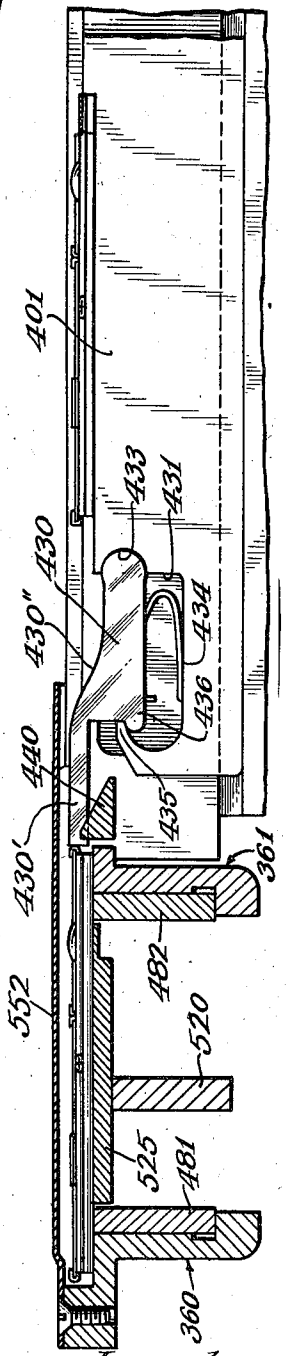


FIG. 21.



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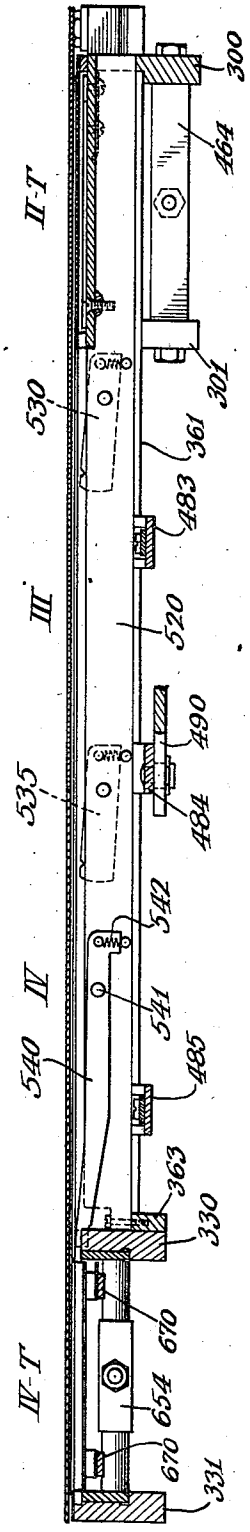


Fig. 22.

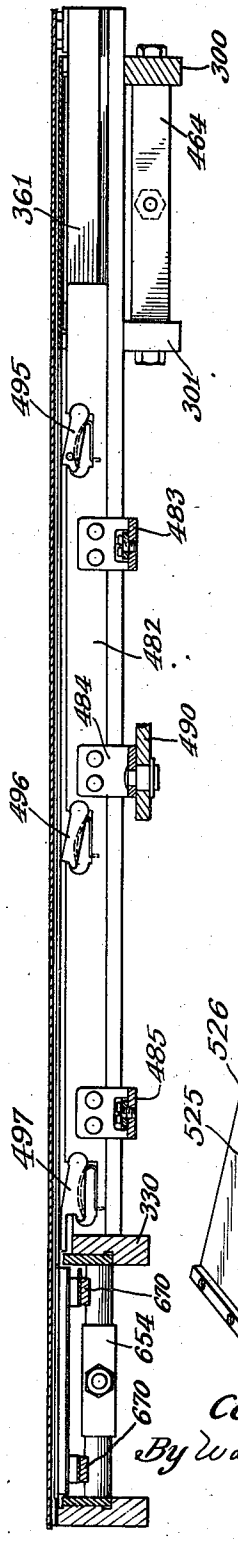


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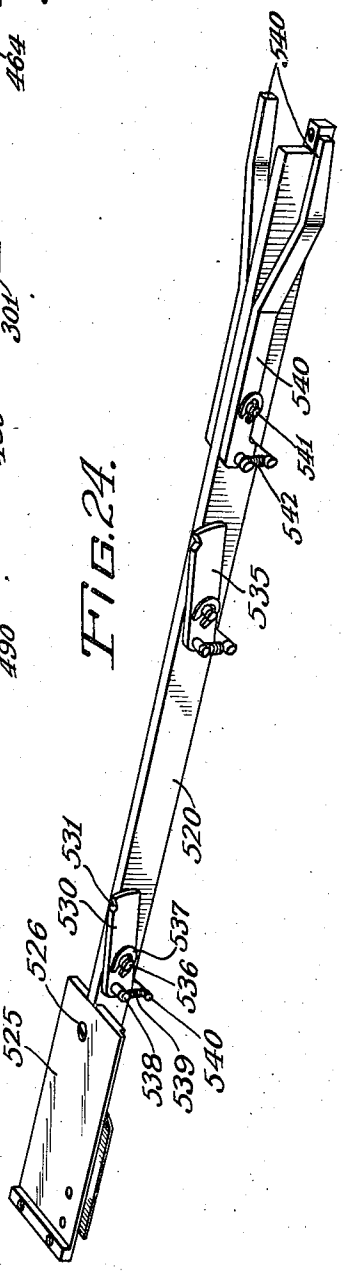


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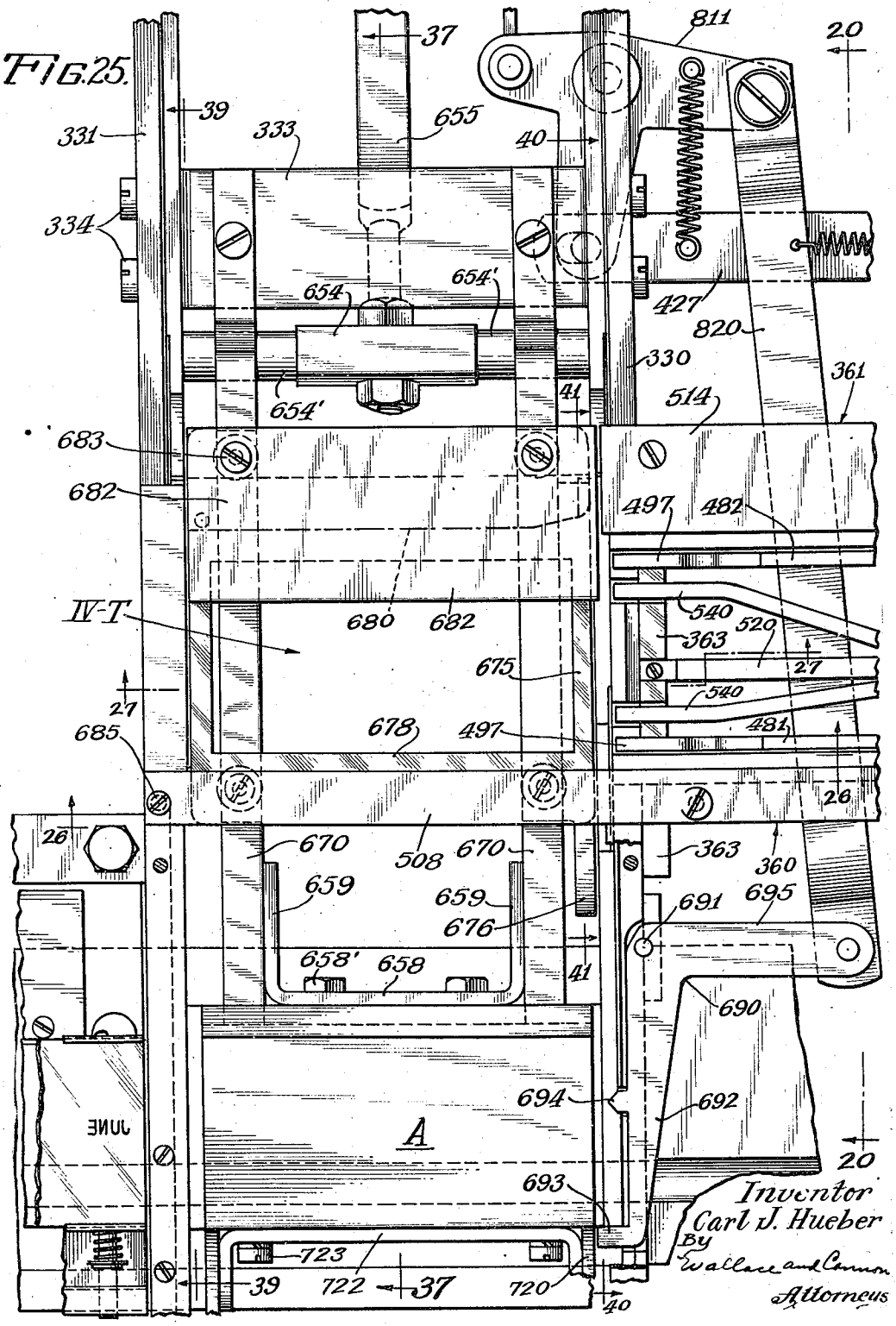
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FIG. 25.



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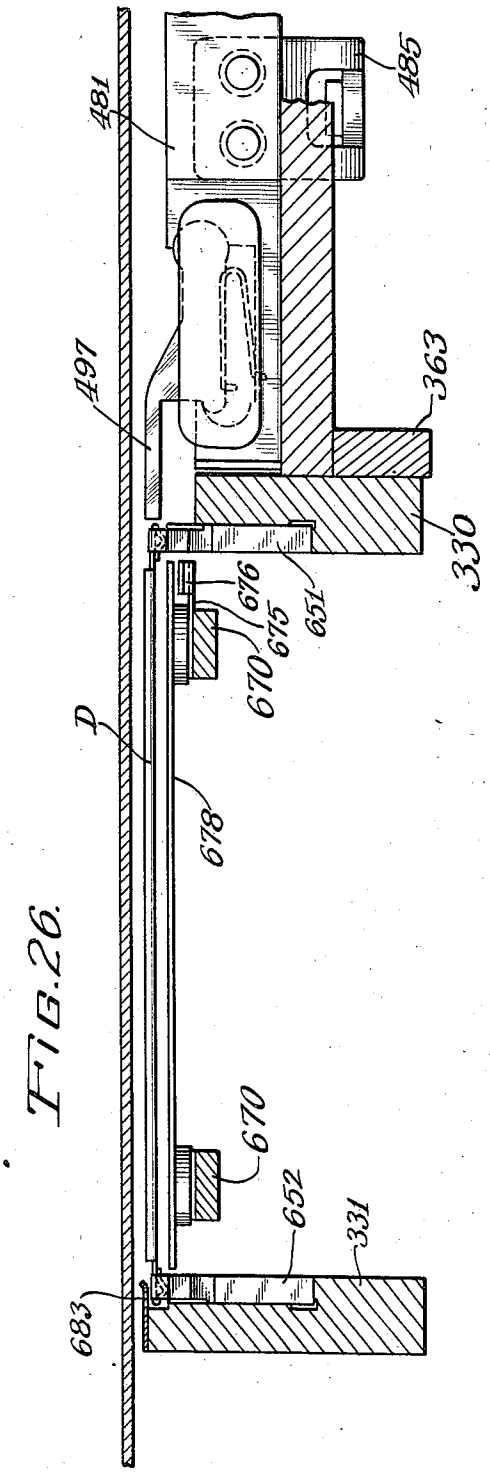


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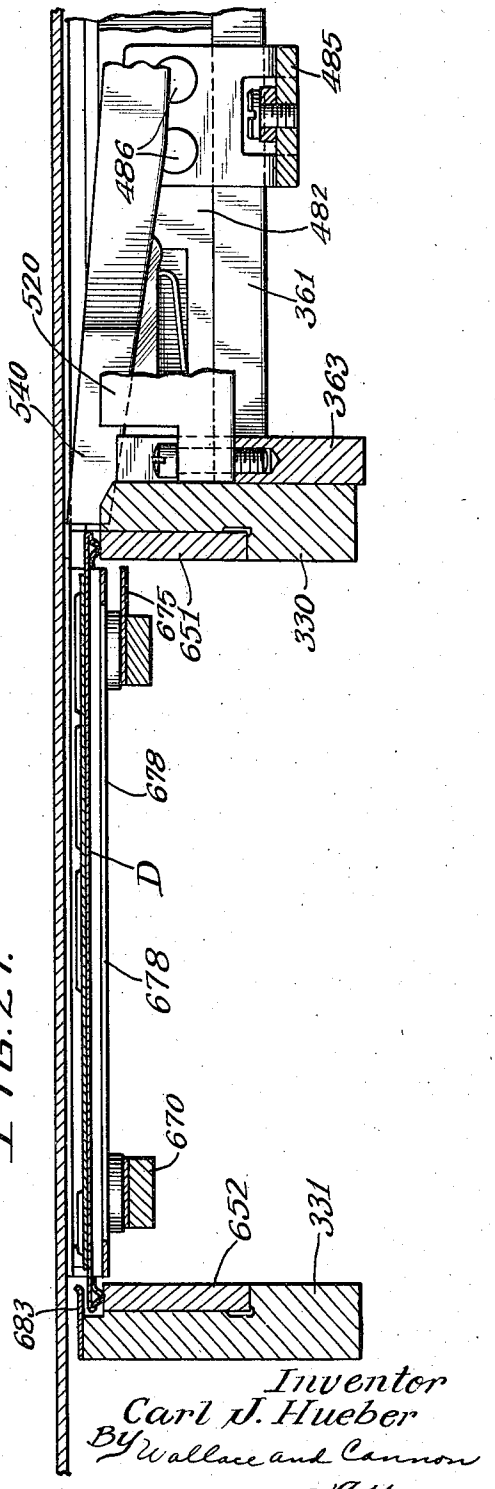


FIG. 27.

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FIG. 28.

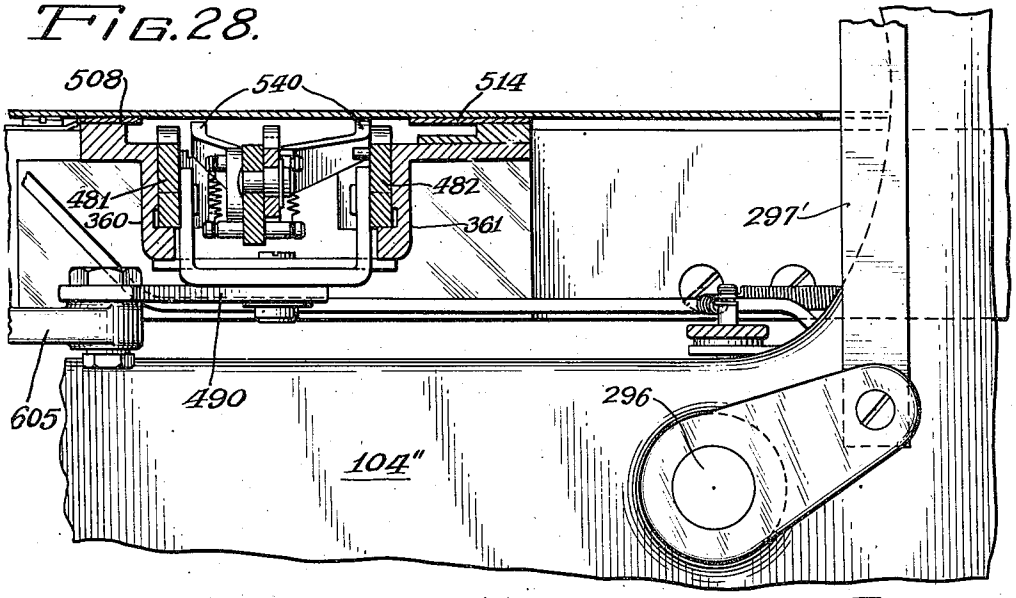


FIG. 29.

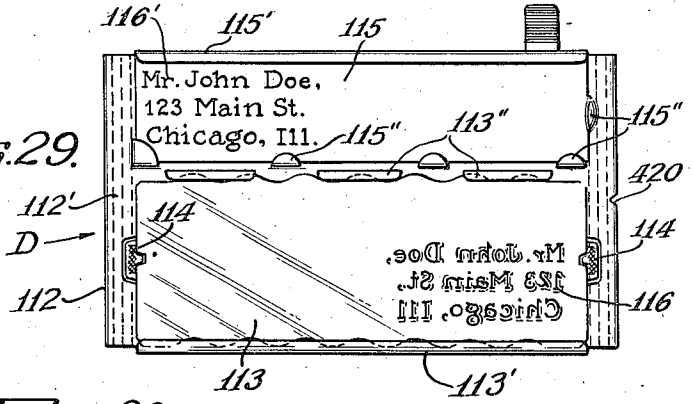
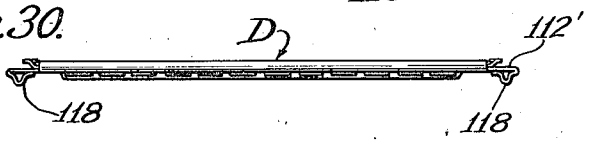


FIG. 30.



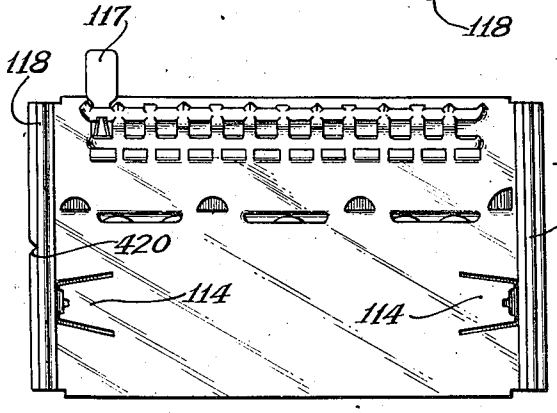


FIG. 31.

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FIG. 32.

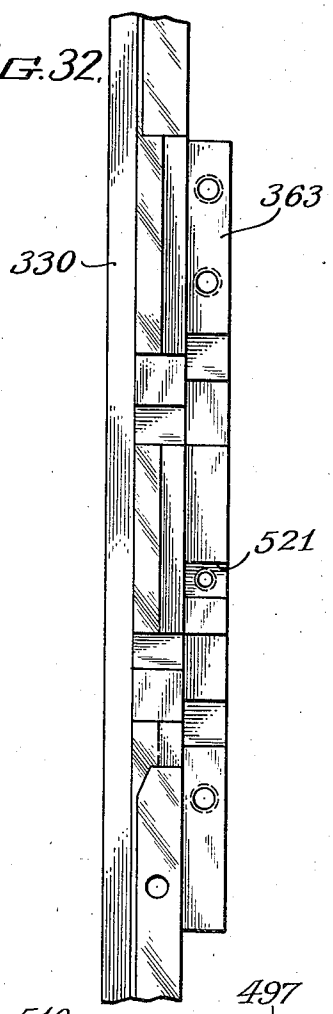


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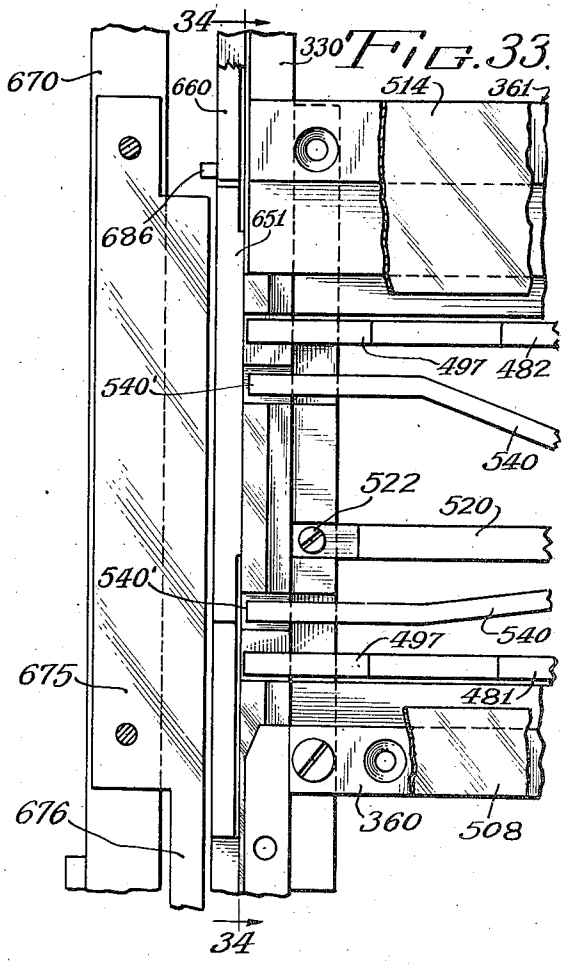
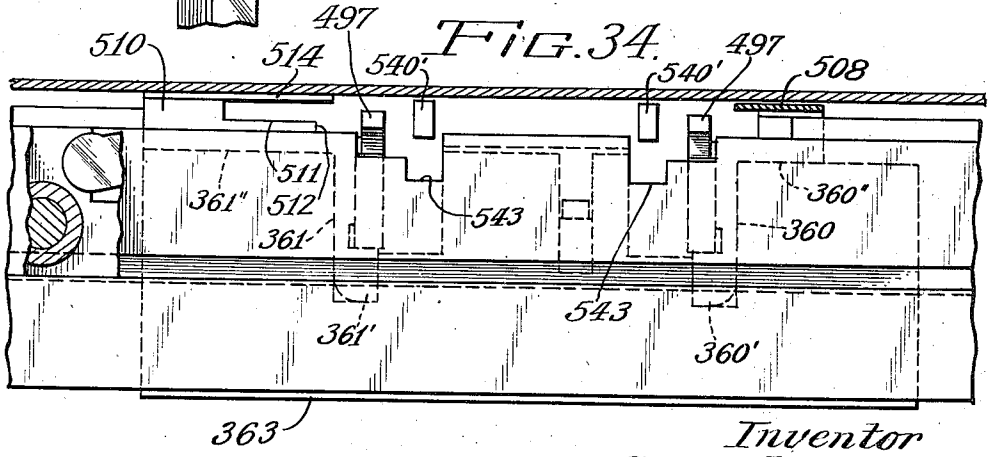


FIG. 34.



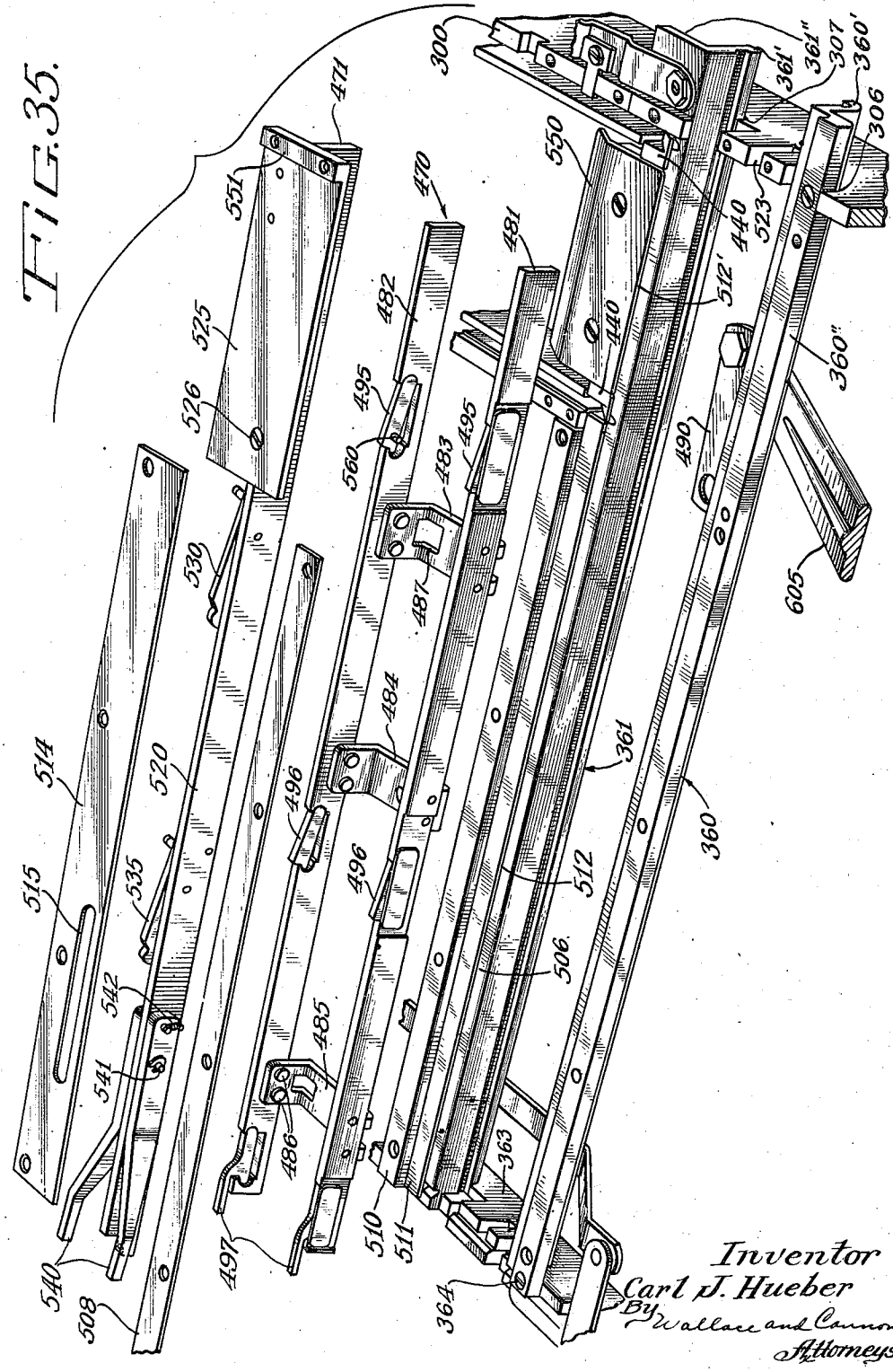
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Fig. 35.



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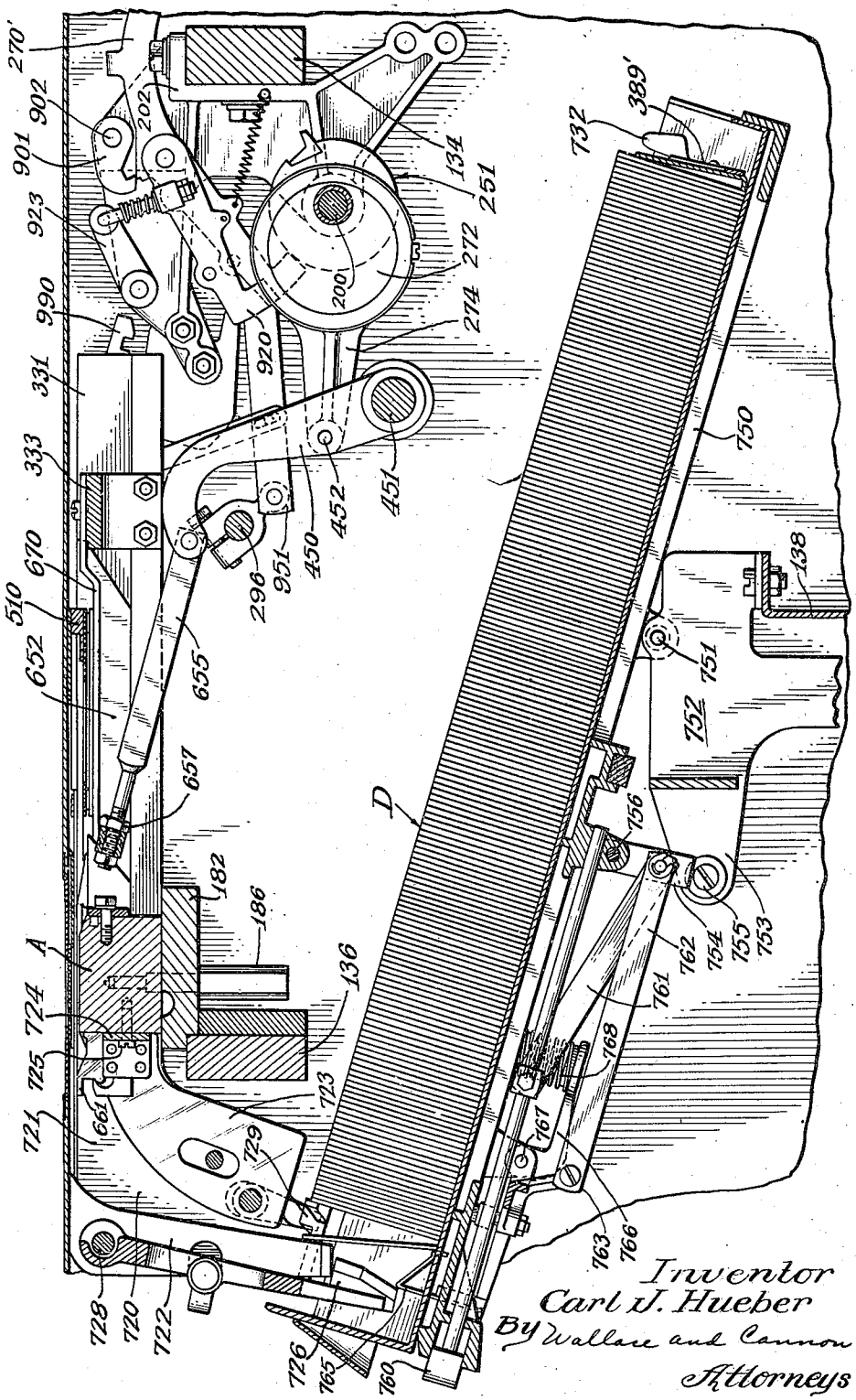


Fig. 36.

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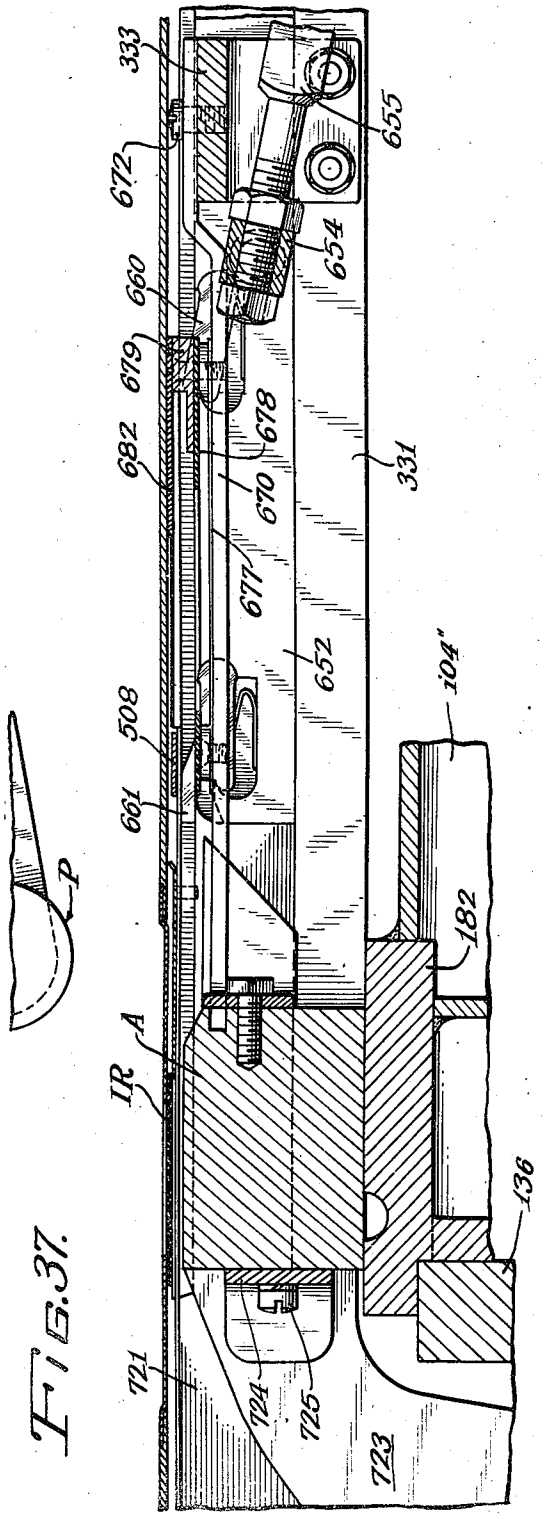


FIG. 37.

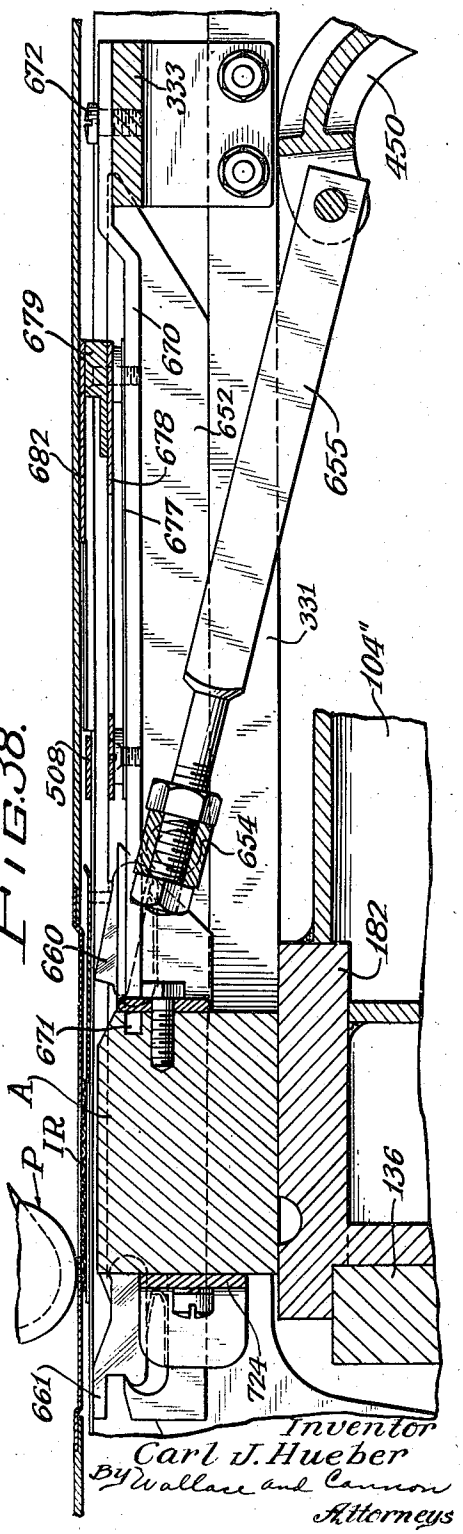


FIG. 38.

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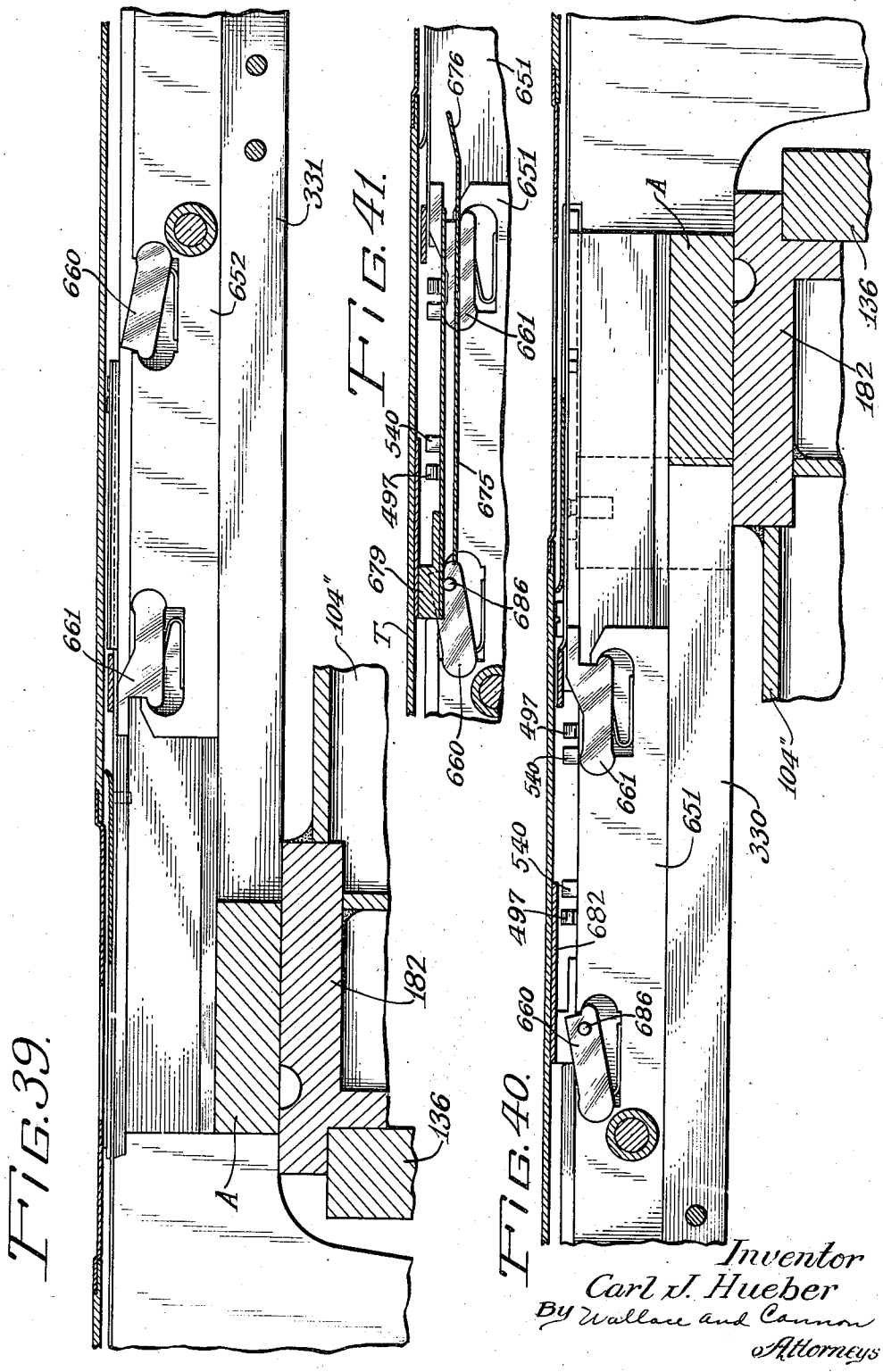


FIG. 39.

FIG. 41.

FIG. 40.

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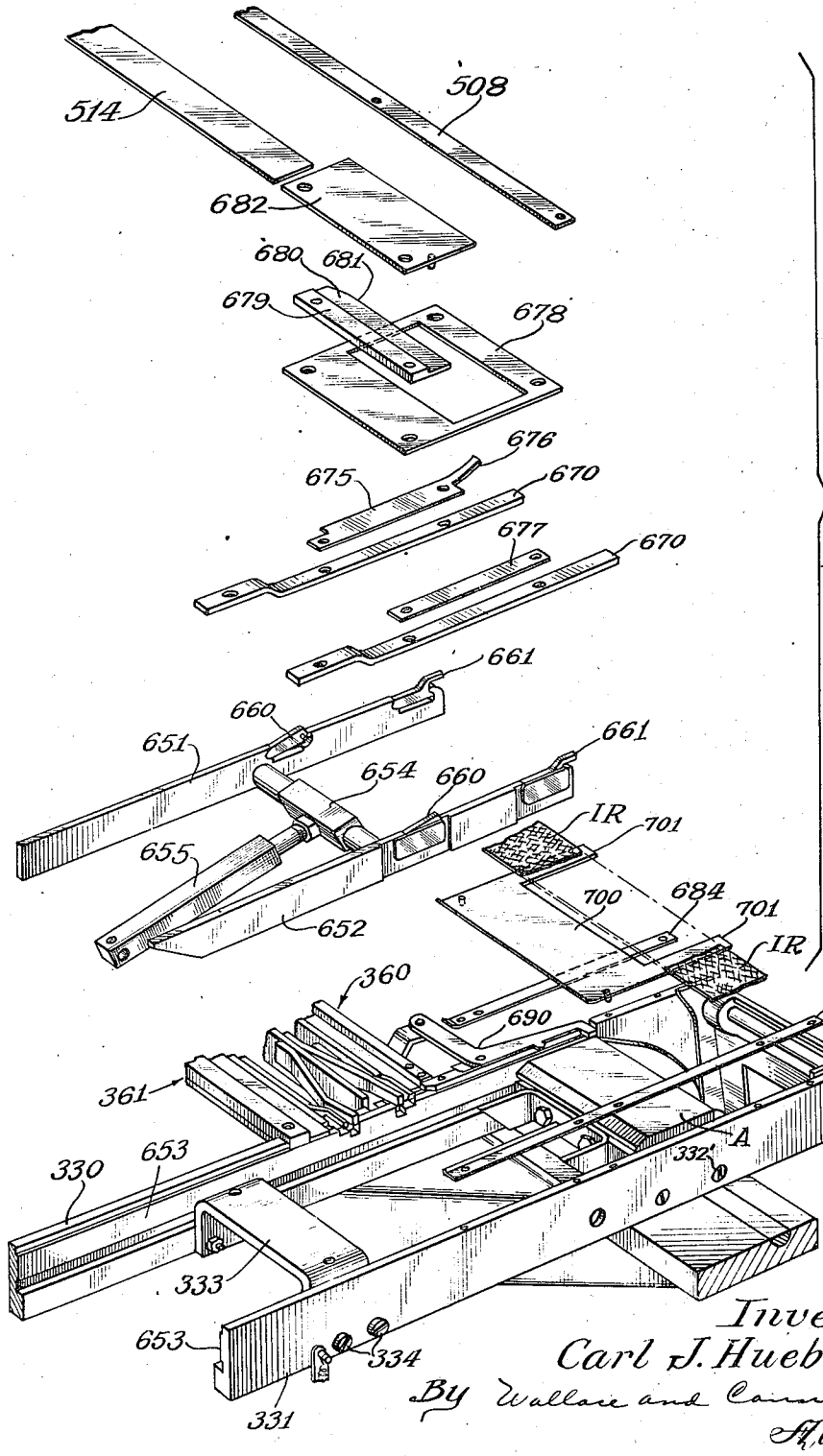


FIG. 42.

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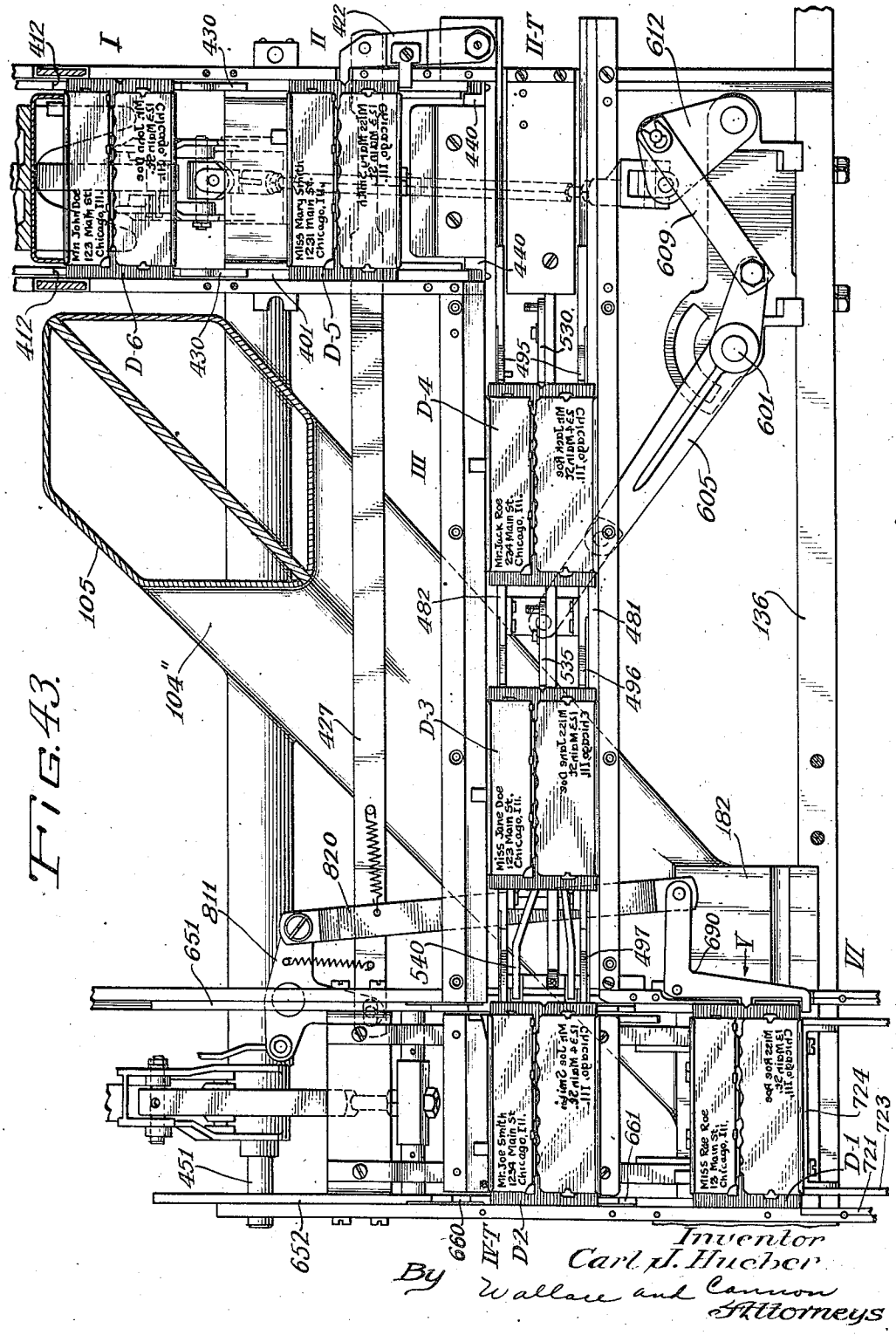


FIG. 43.

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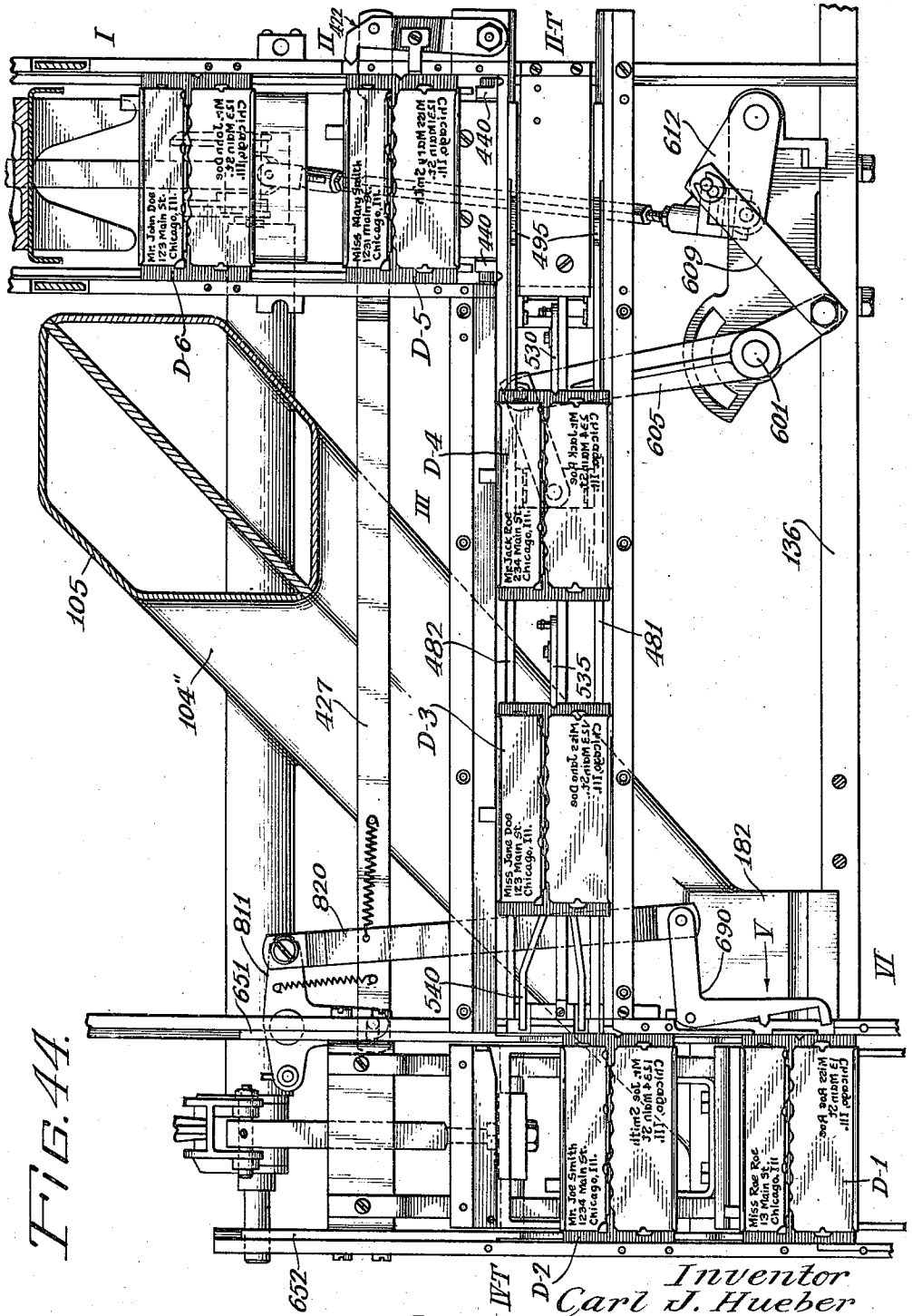


Fig. 44.

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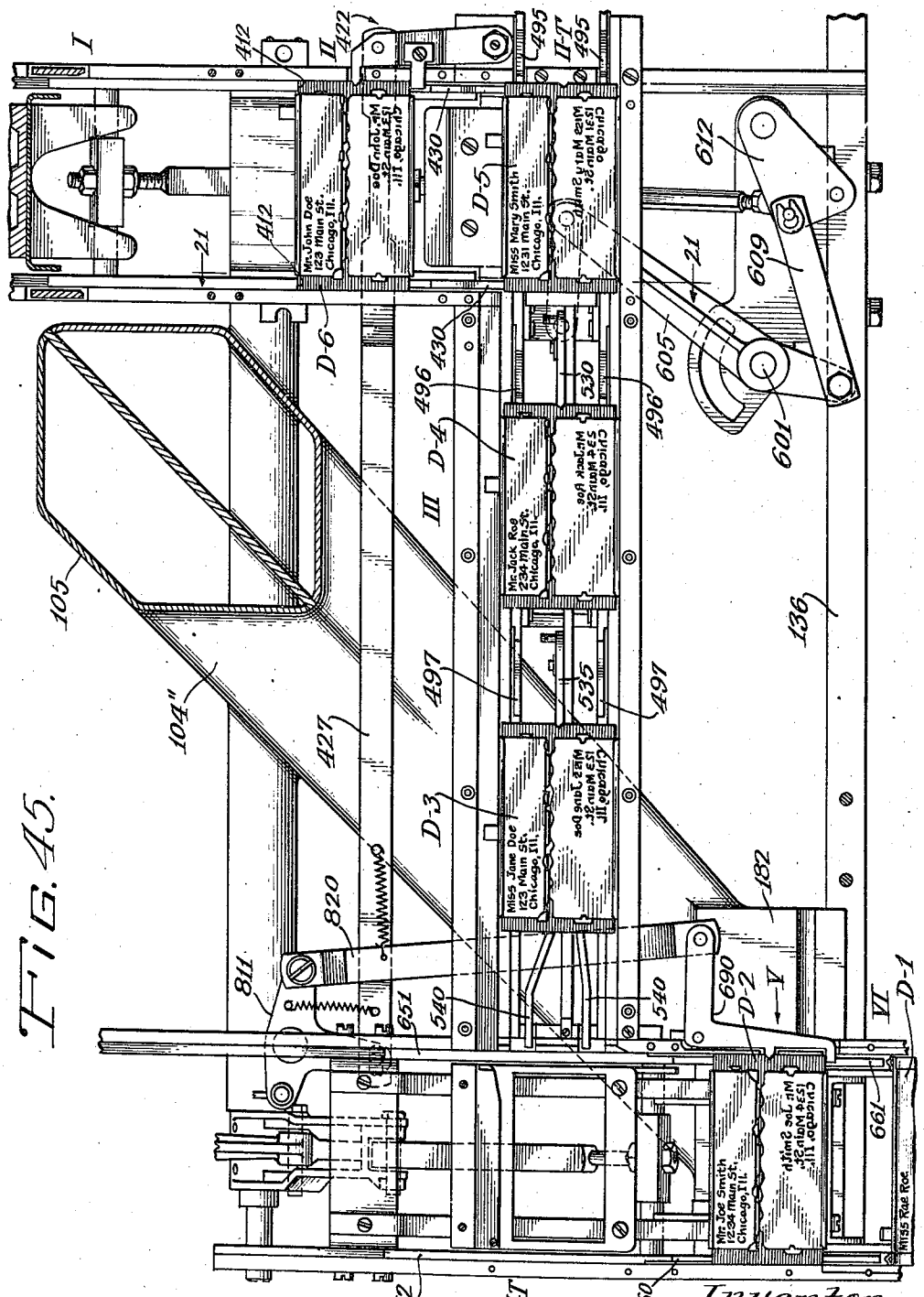


FIG. 45.

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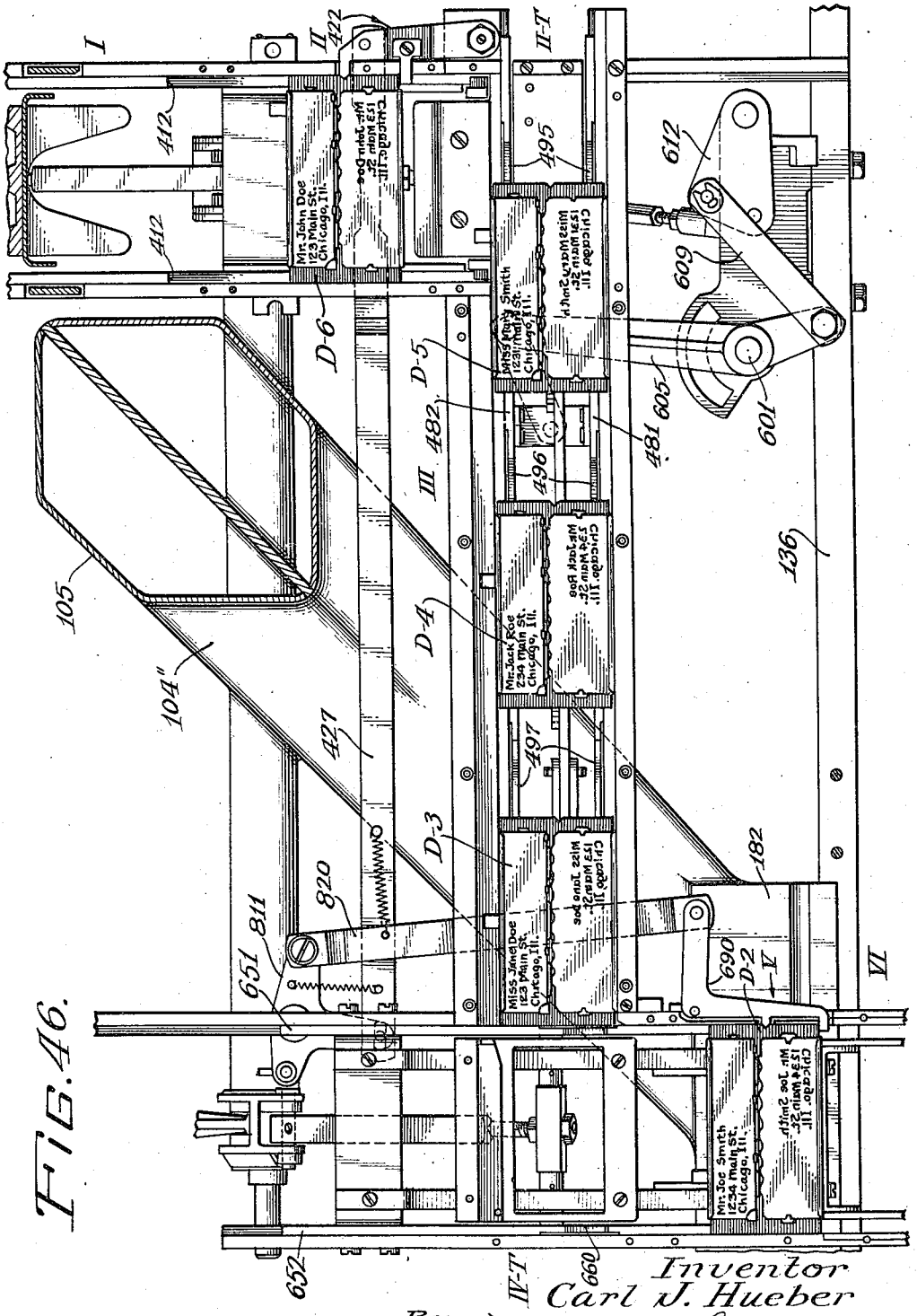


FIG. 46.

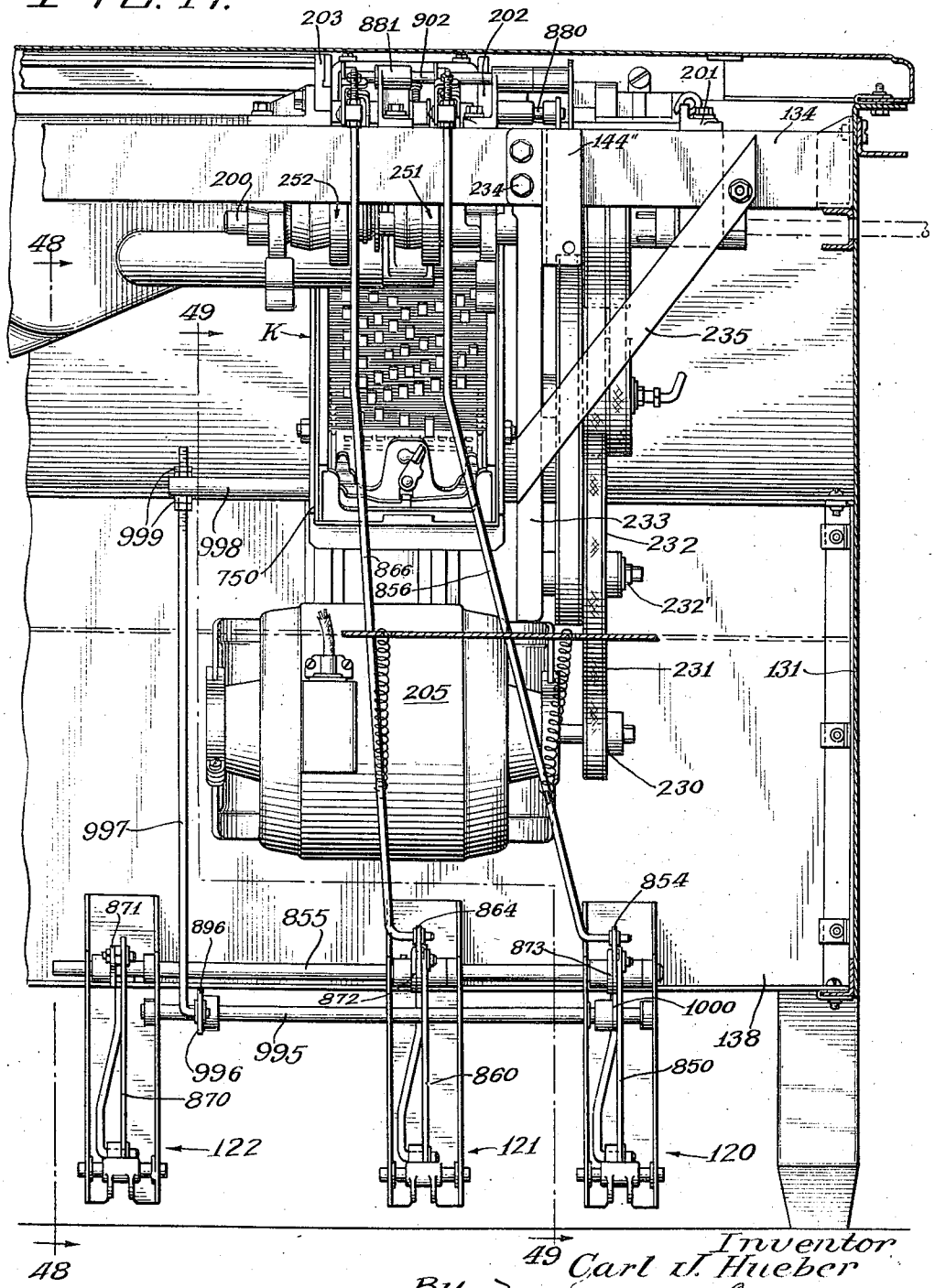
Inventor
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FIG. 47.



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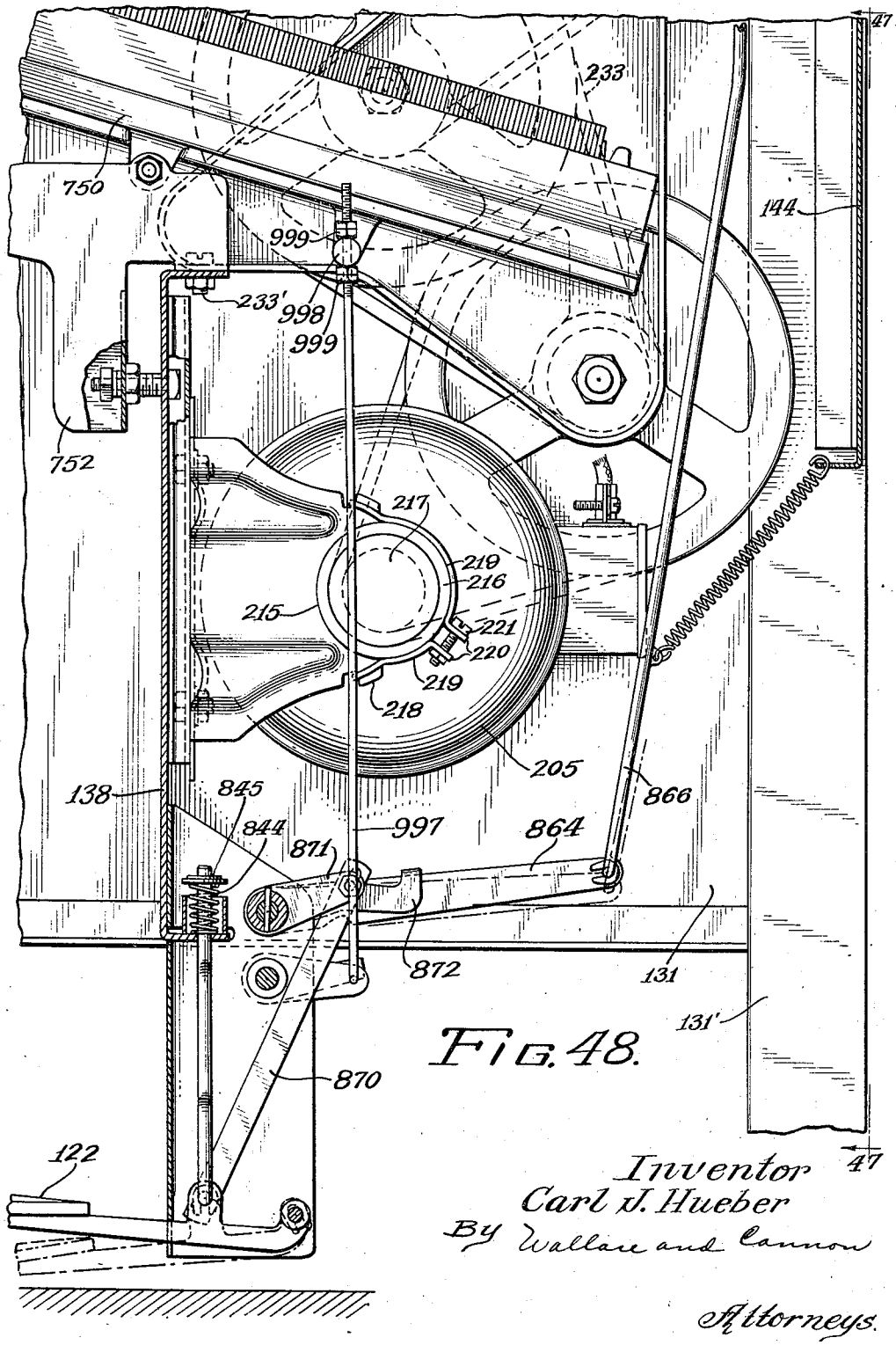


FIG. 48.

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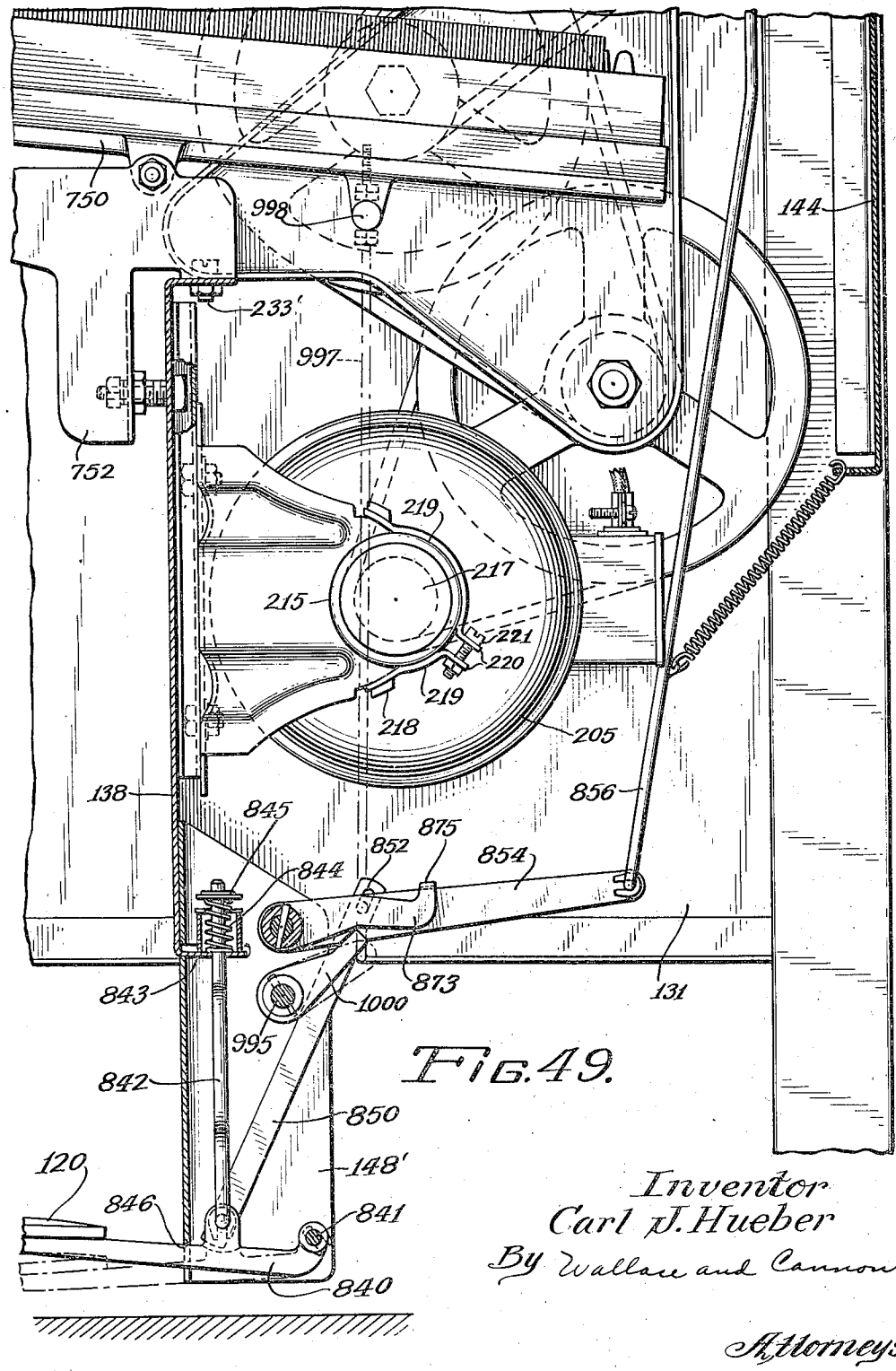


Fig. 49.

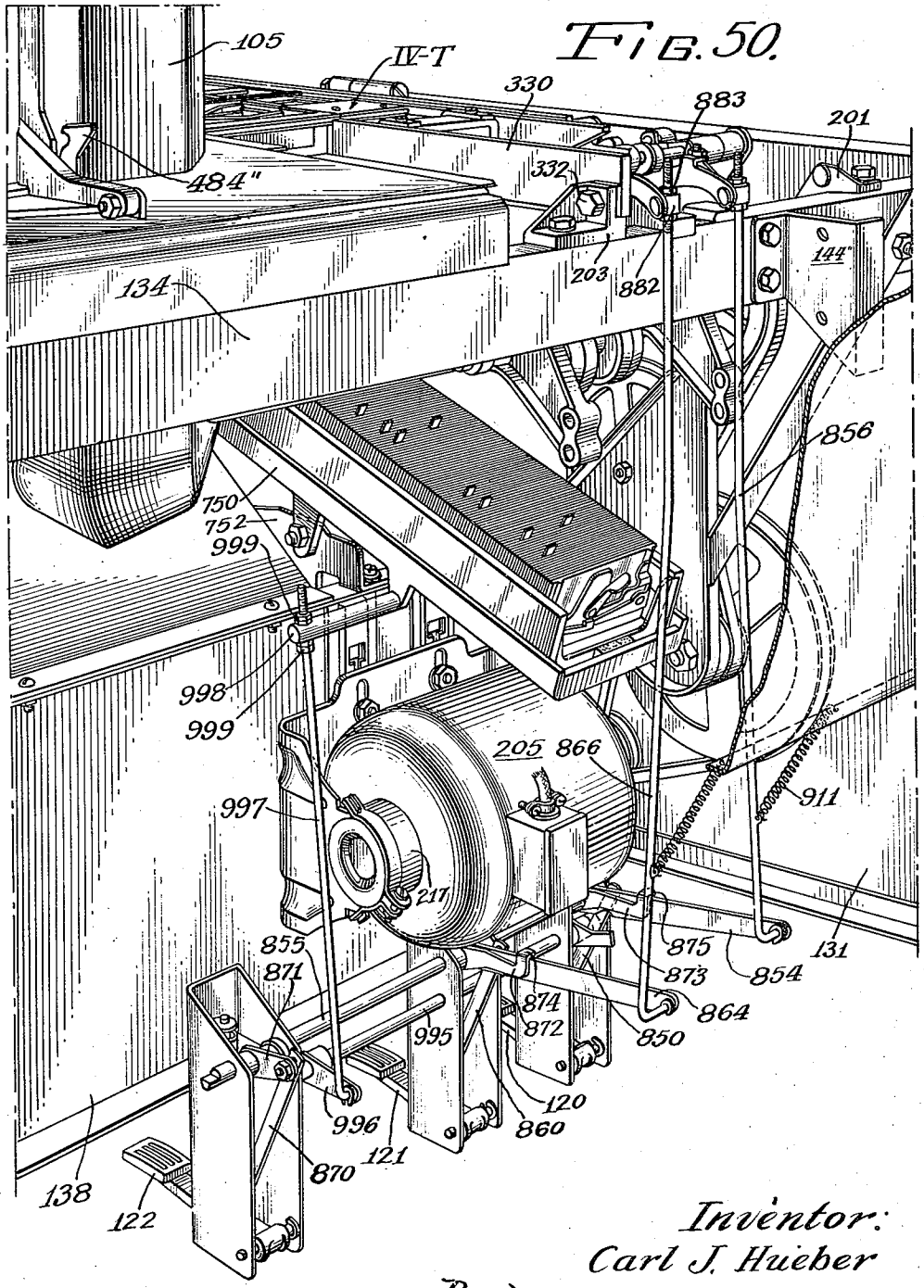
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FIG. 50.



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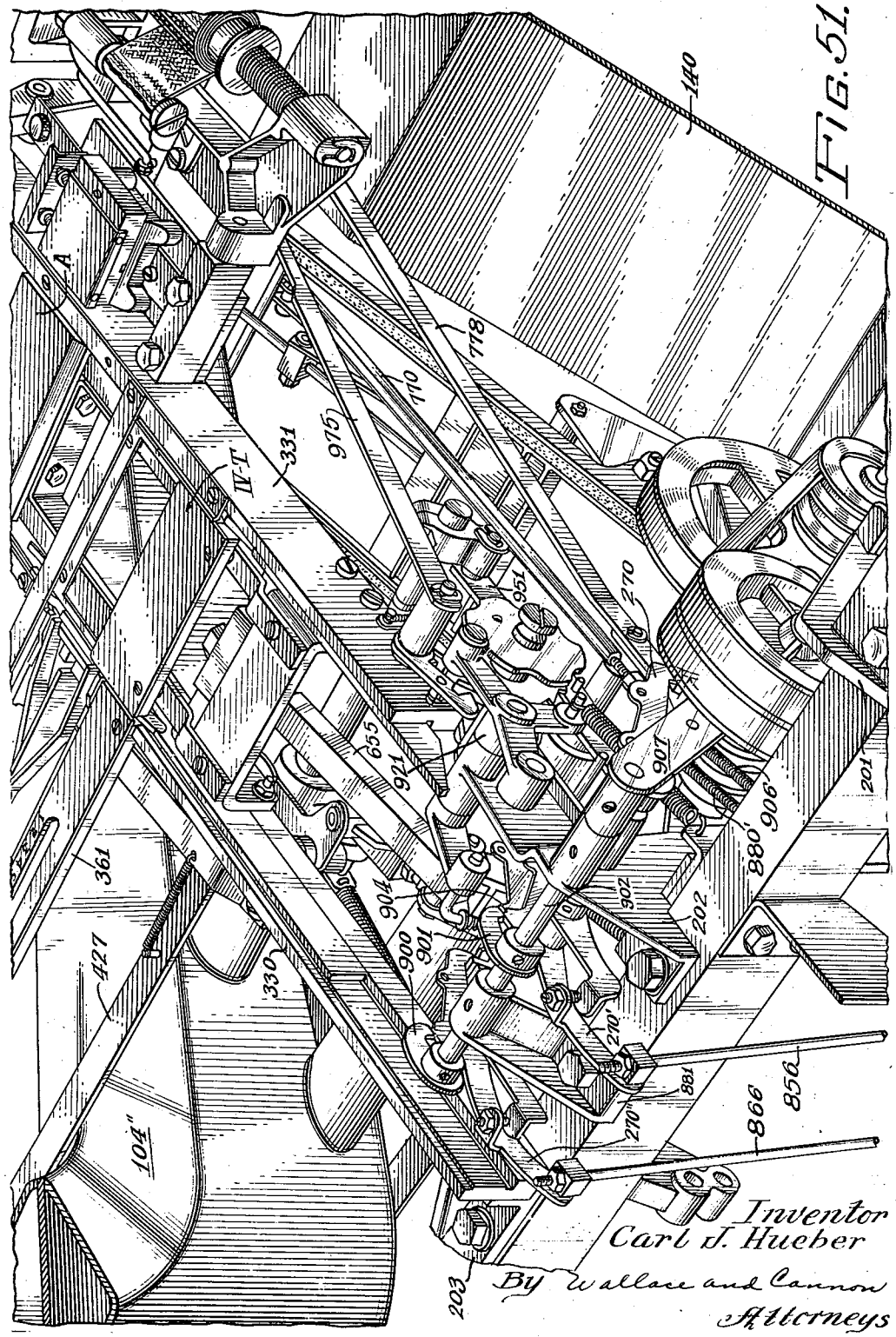


Fig. 51.

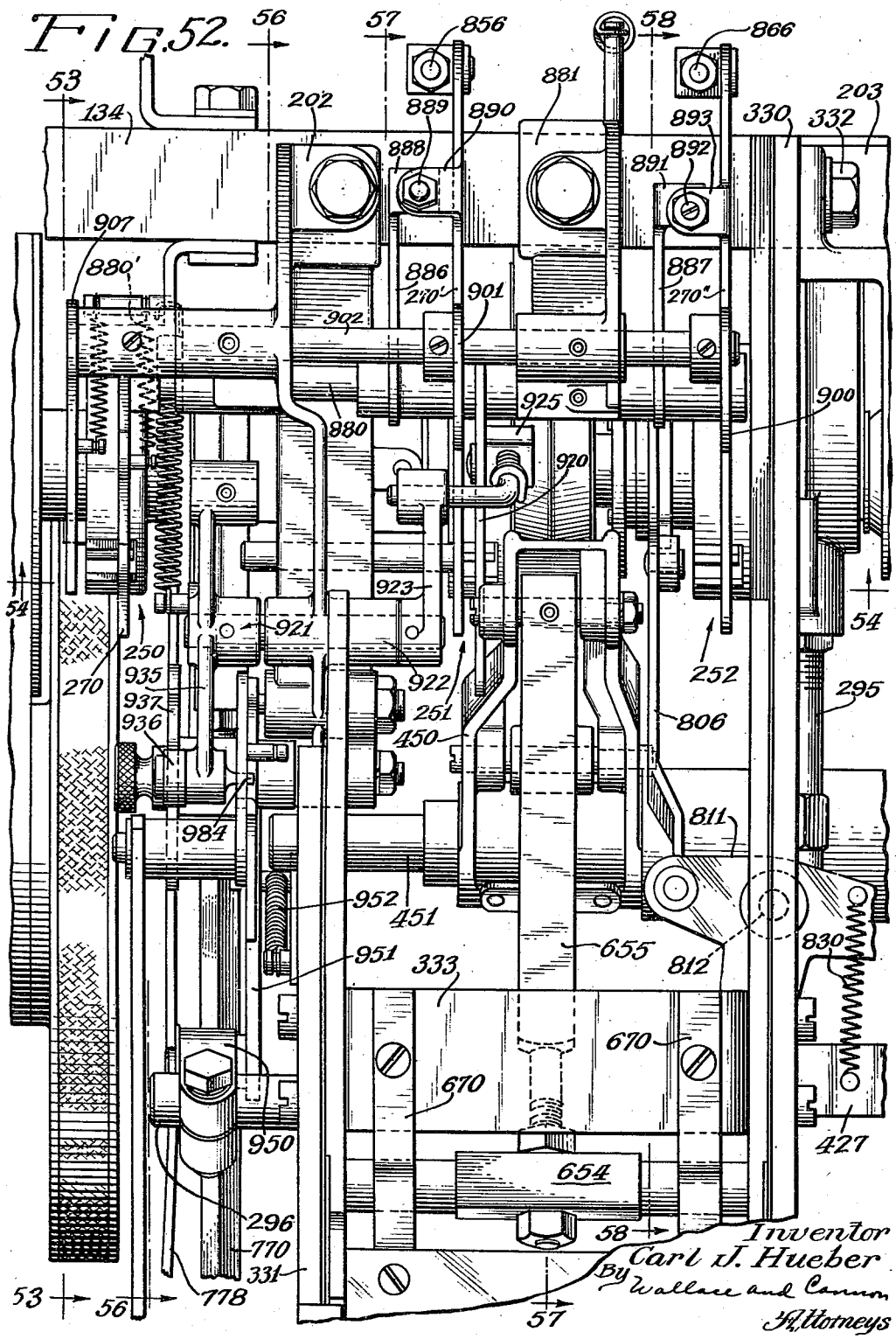
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Fig. 52.



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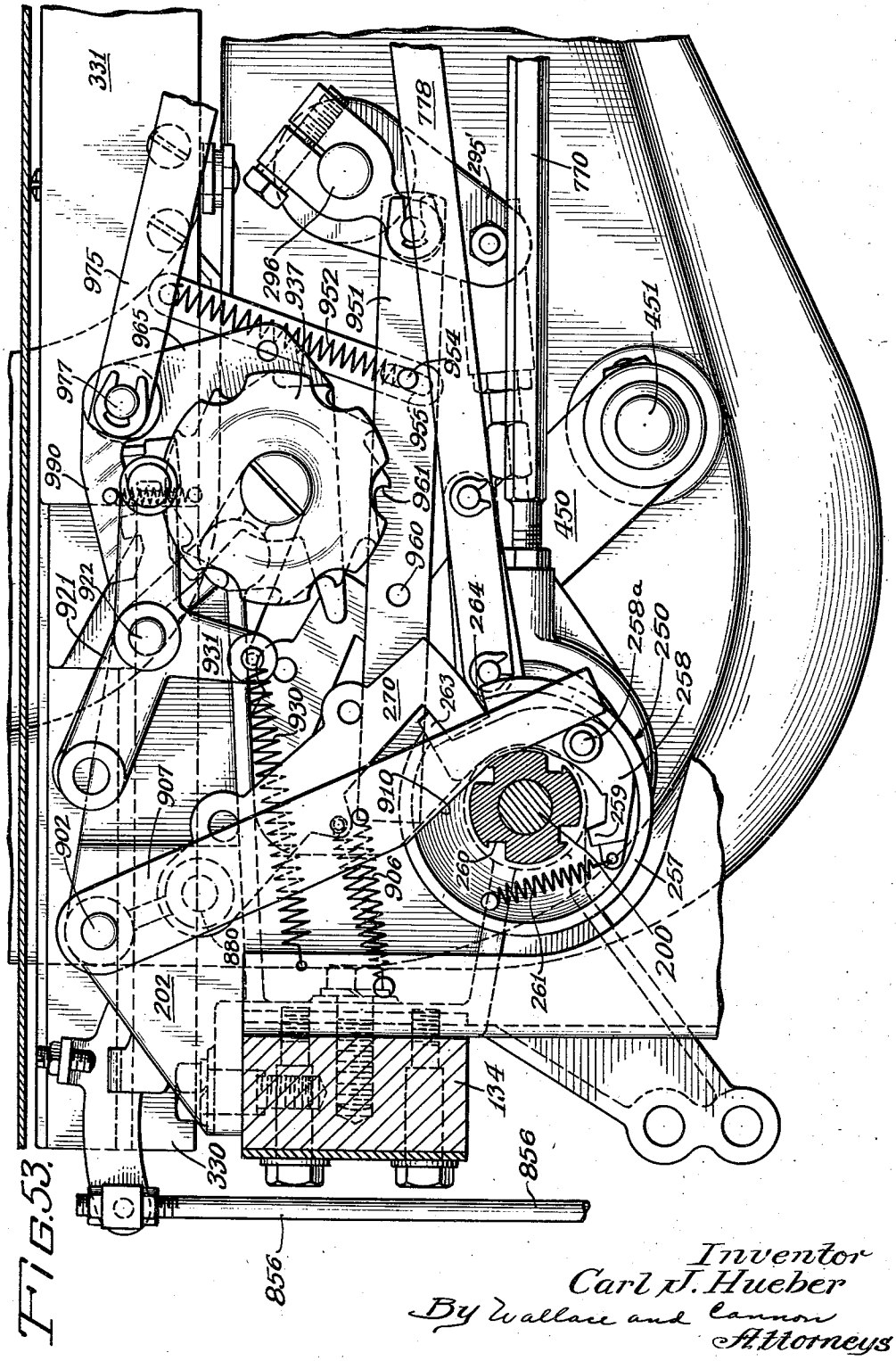


FIG. 53.

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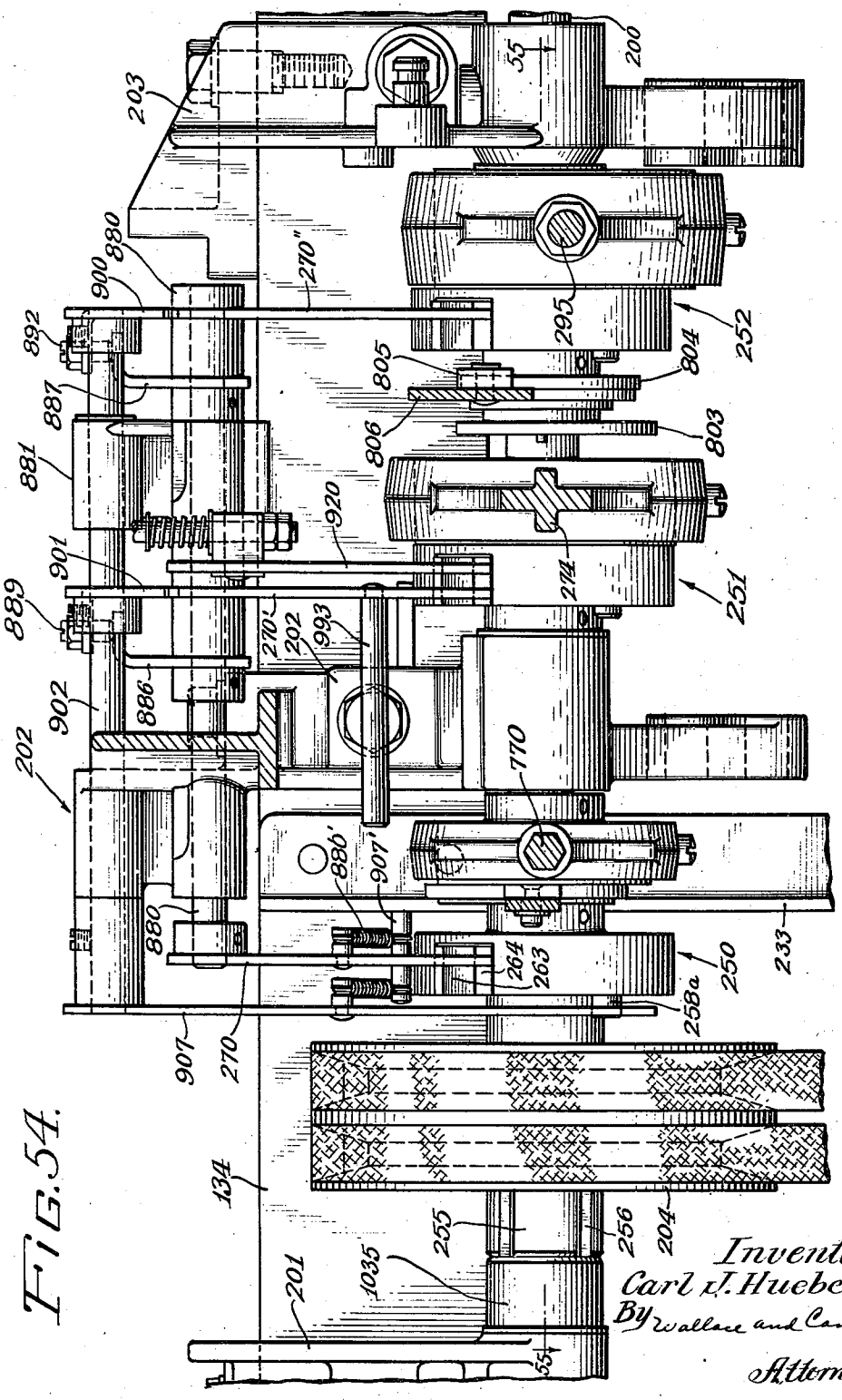


Fig. 54.

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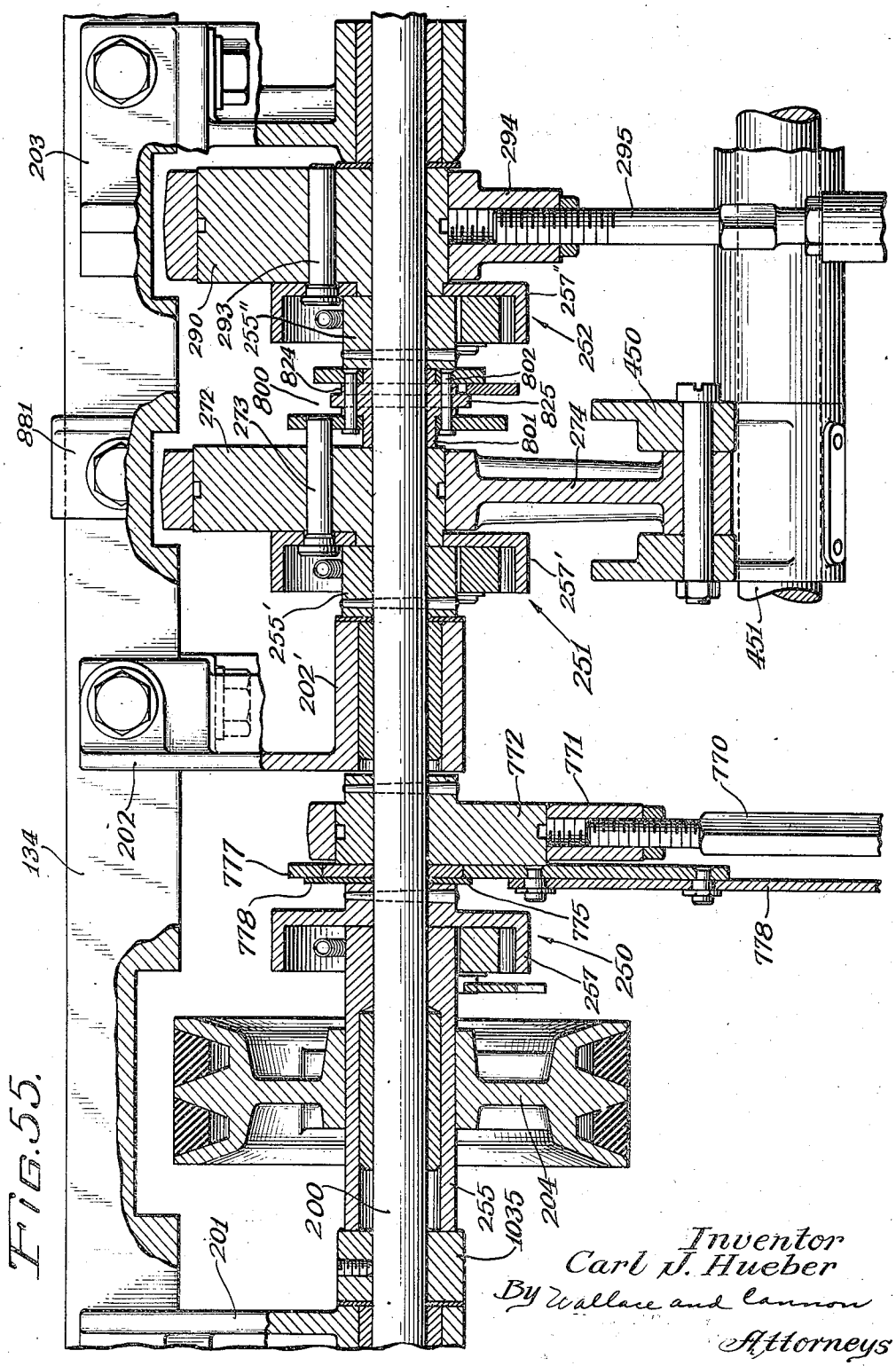


Fig. 55.

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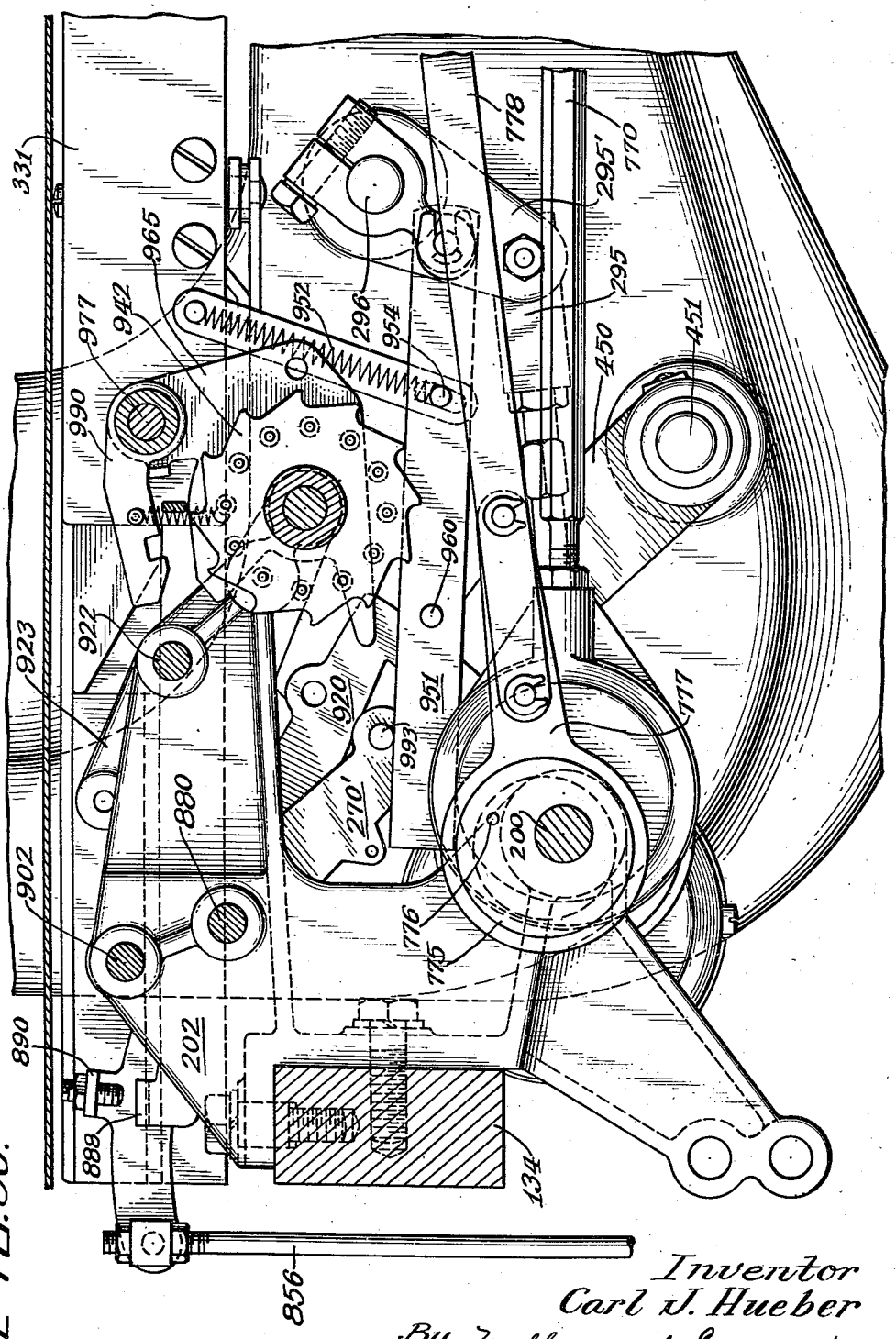


Fig. 56.

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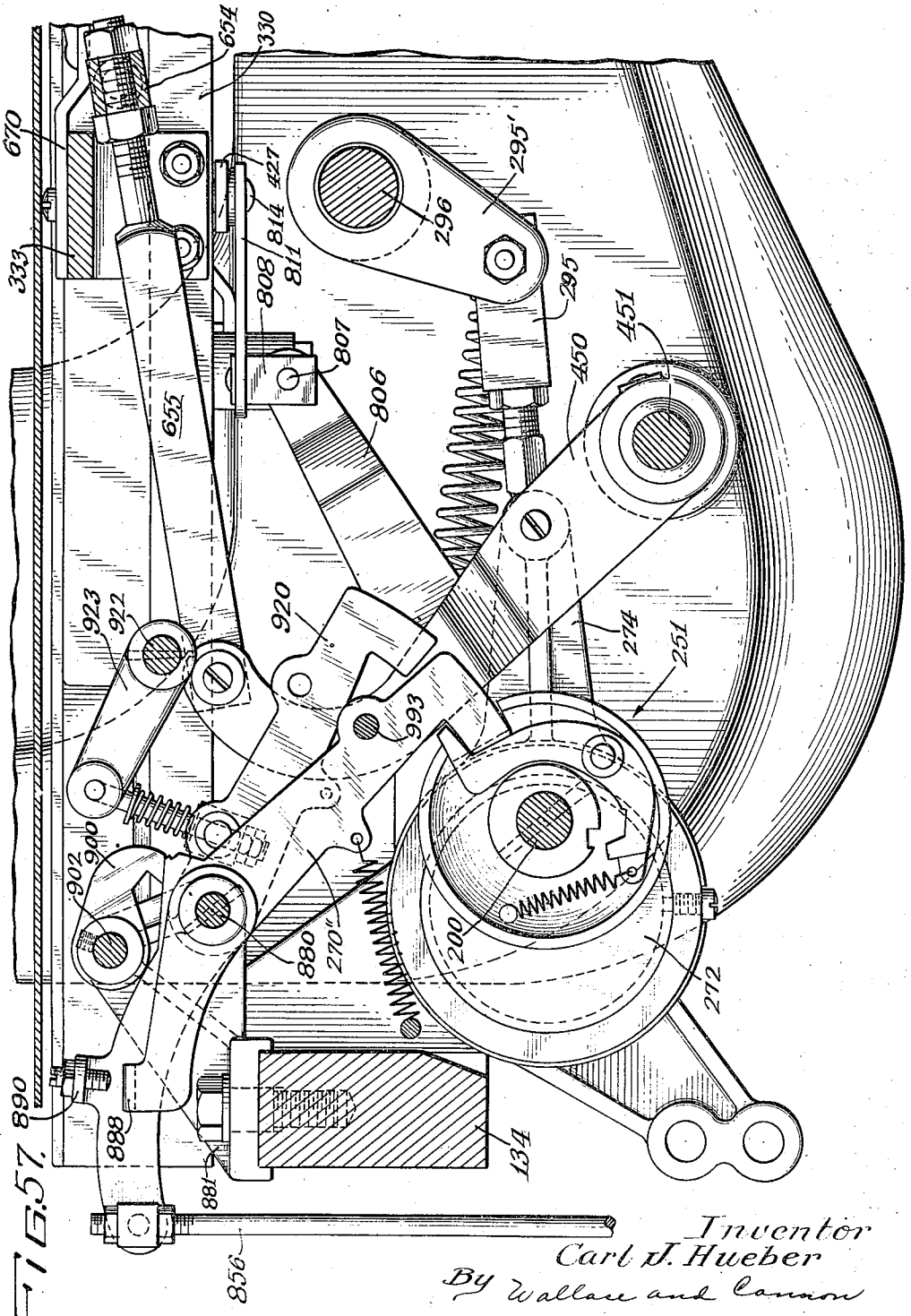


FIG. 57.

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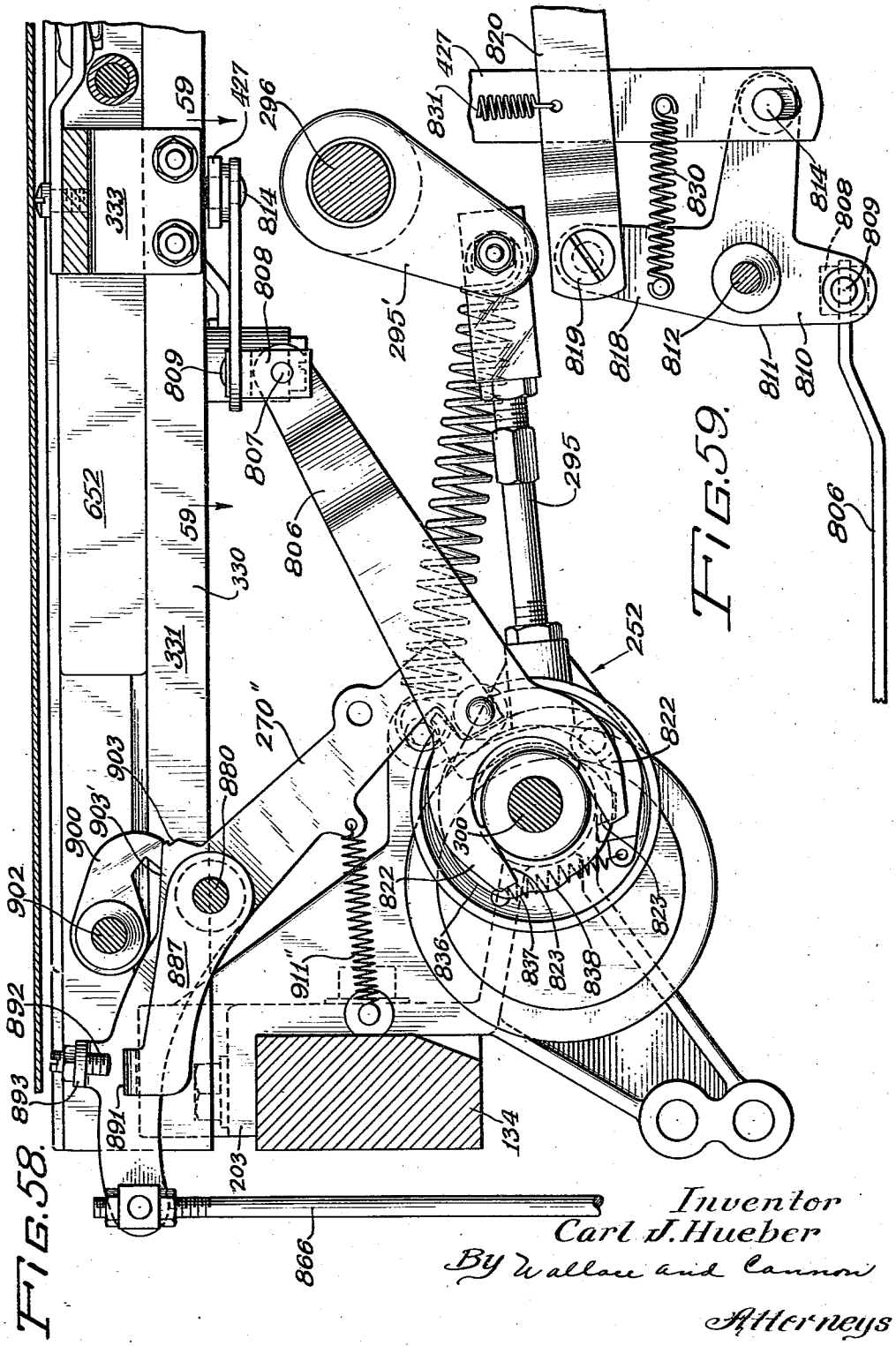


FIG. 58.

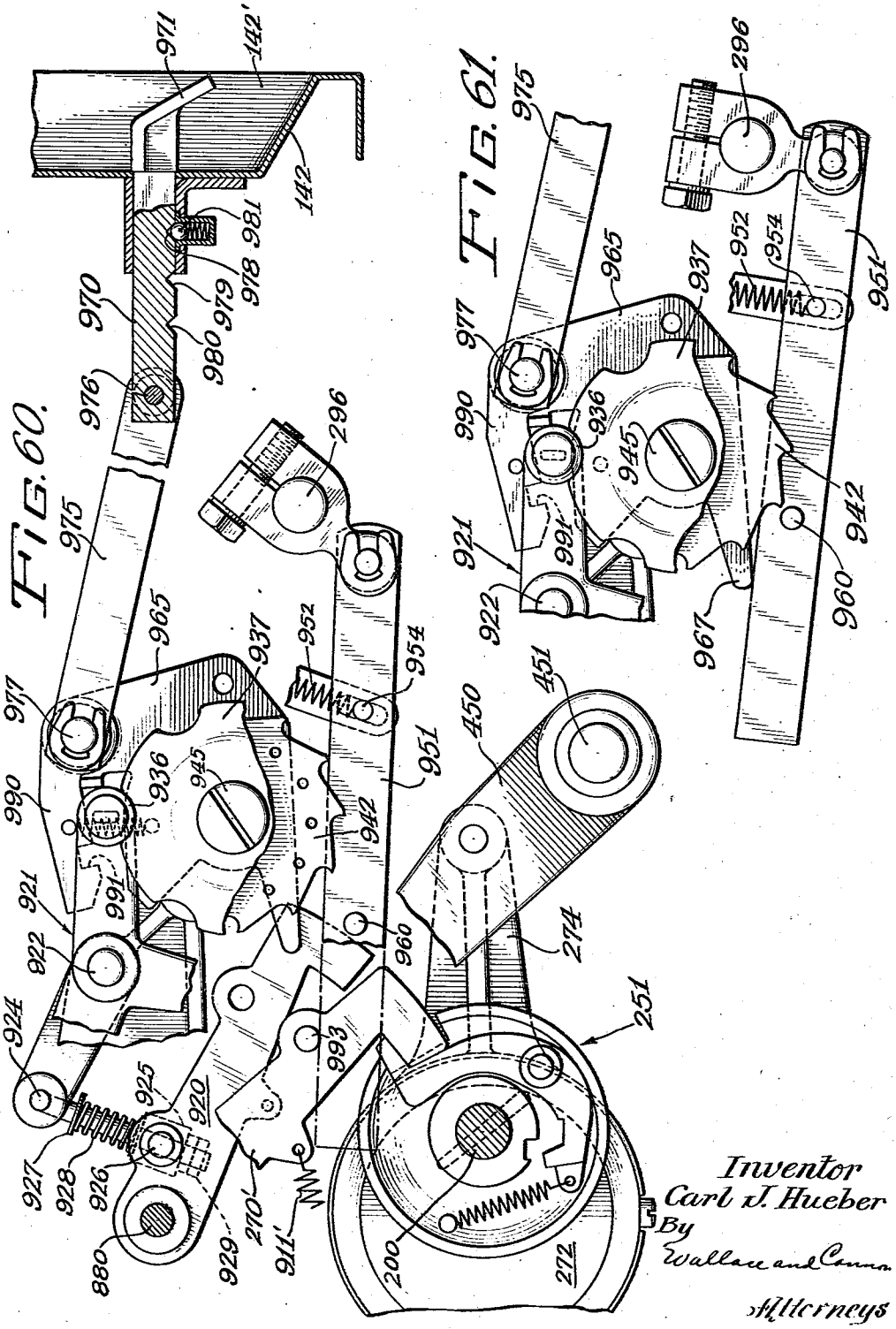
FIG. 59.

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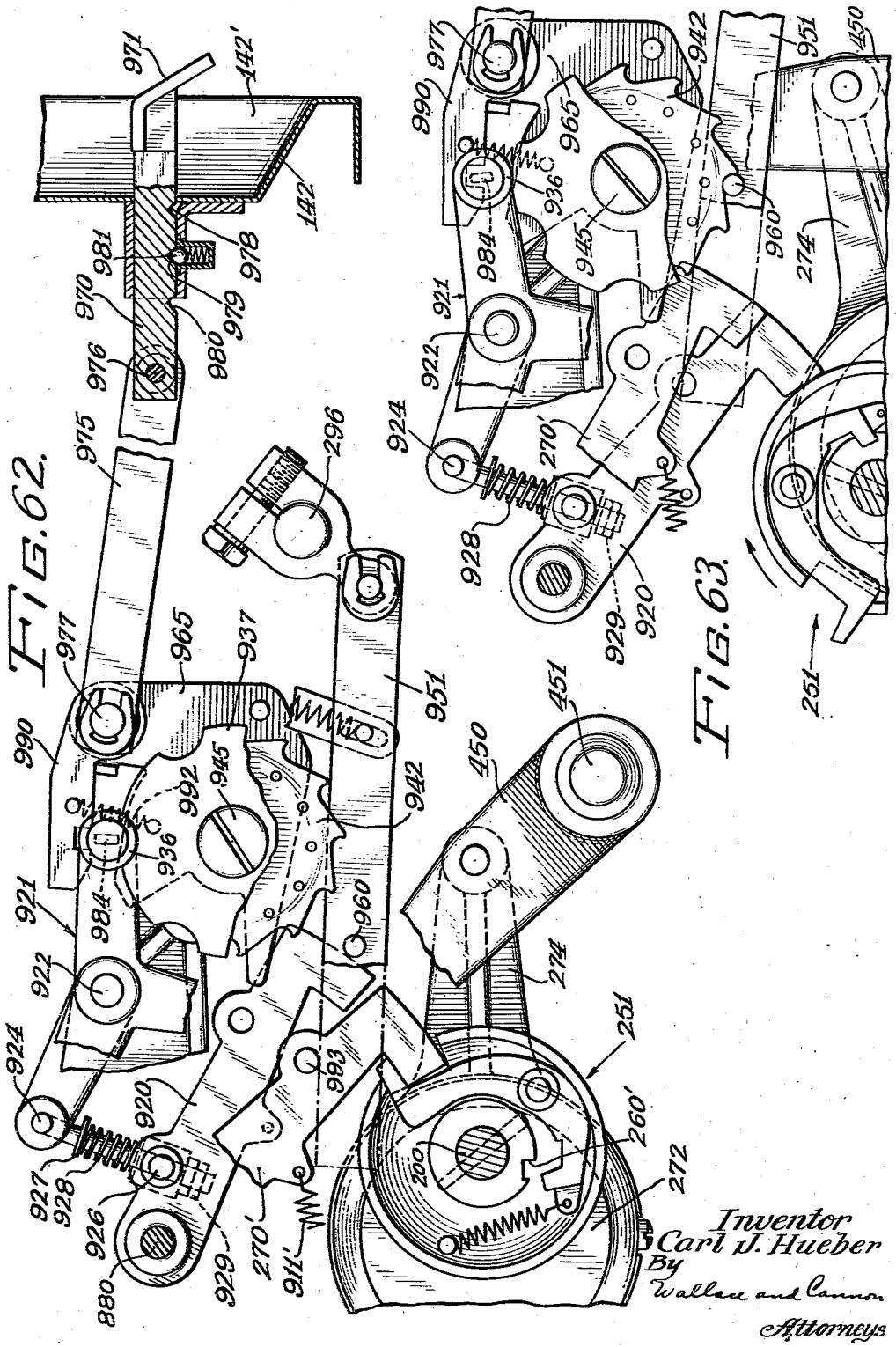


FIG. 62.

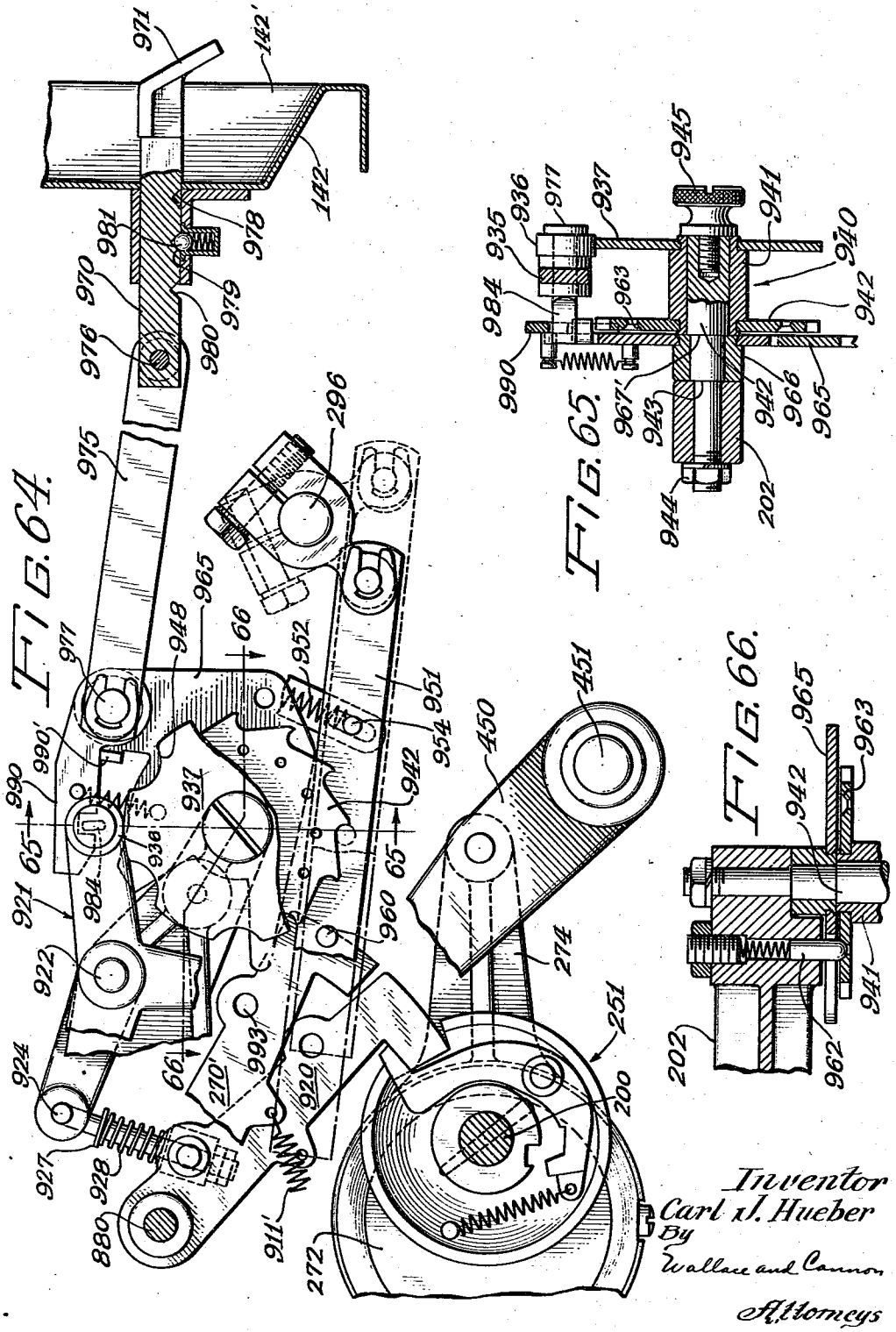
FIG. 63.

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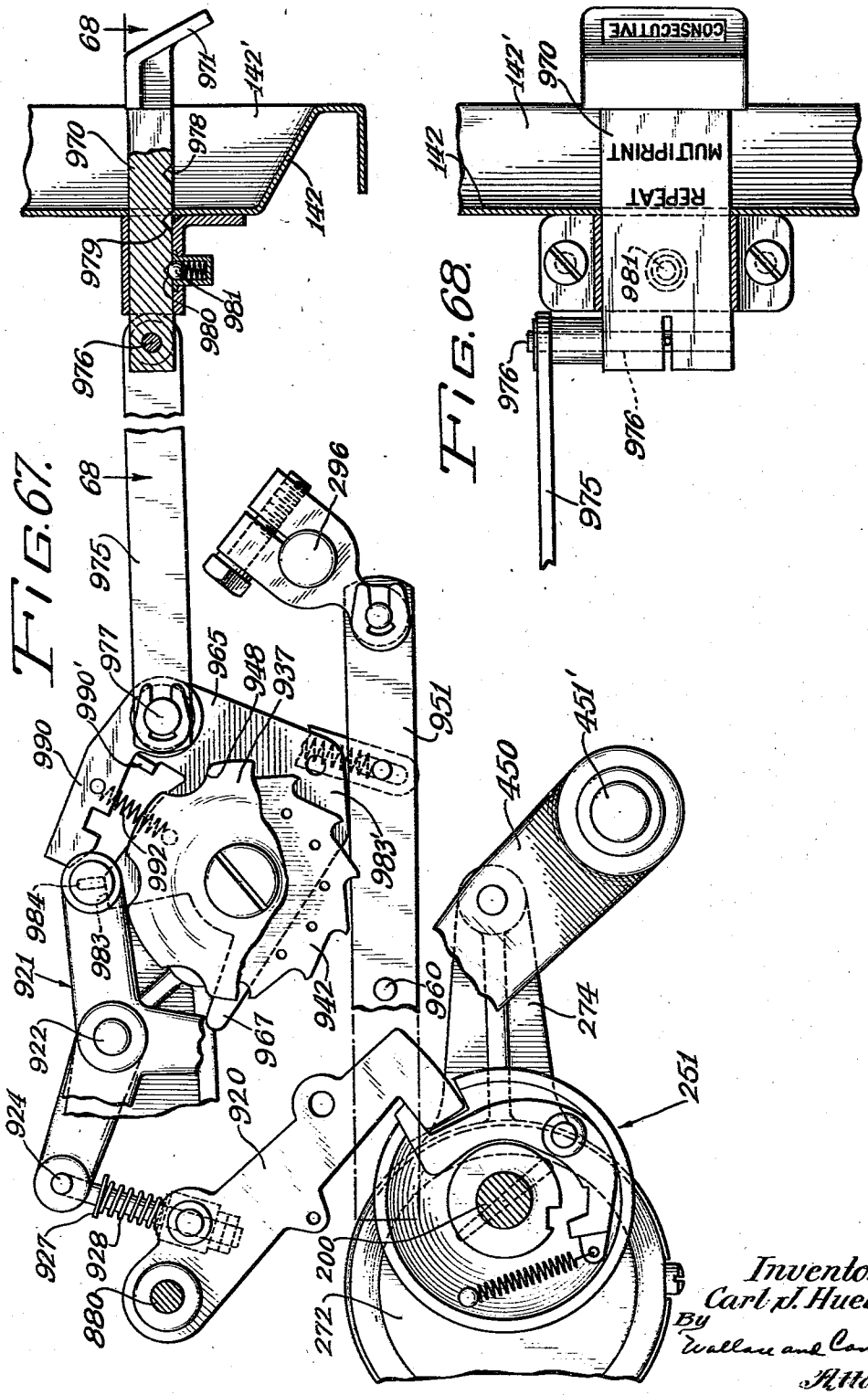


FIG. 67.

FIG. 68.

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Fig. 69.

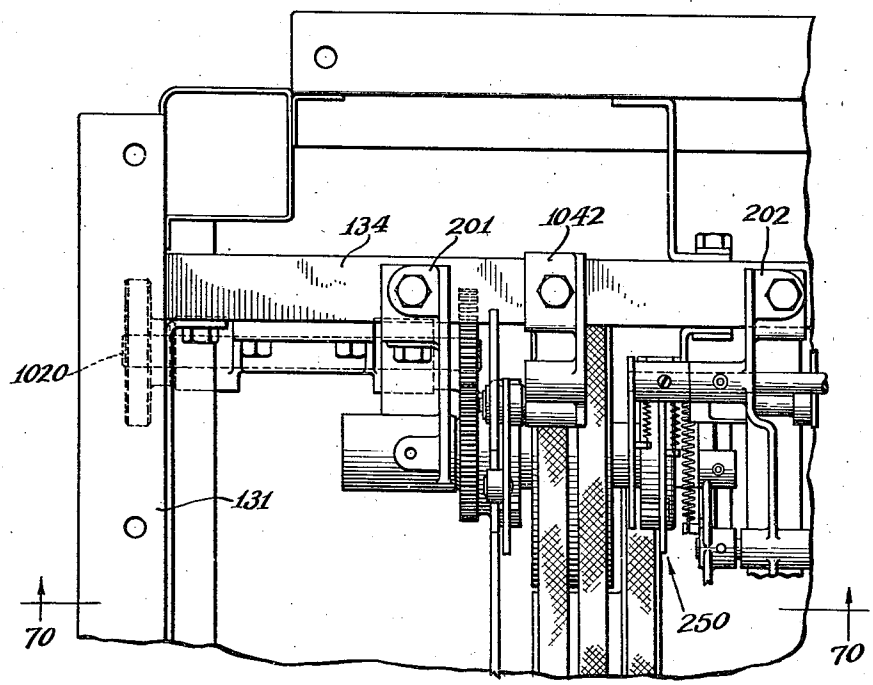
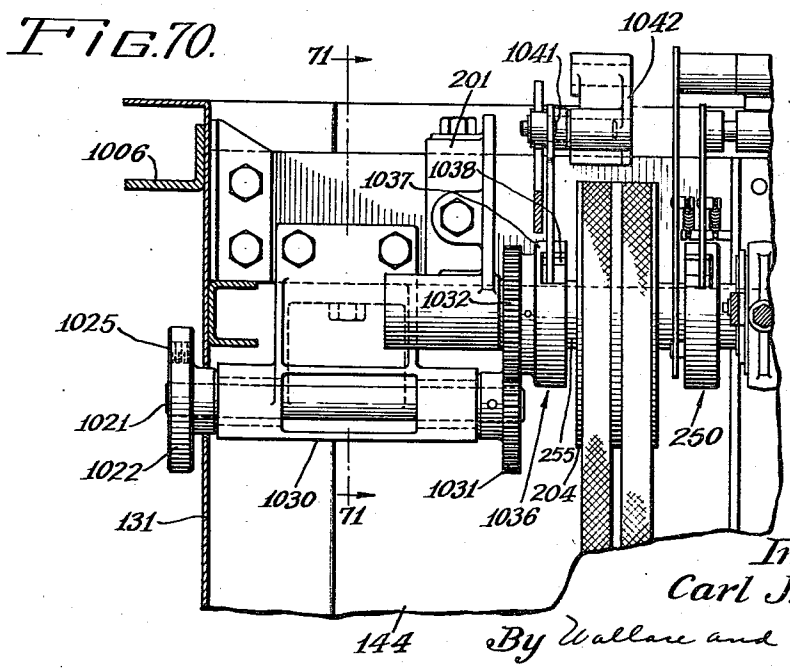


Fig. 70.



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FIG. 71.

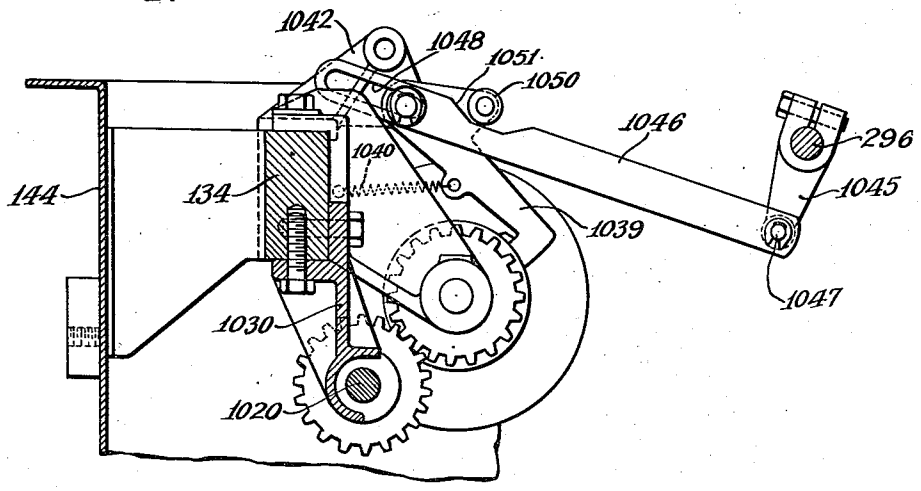


FIG. 72.

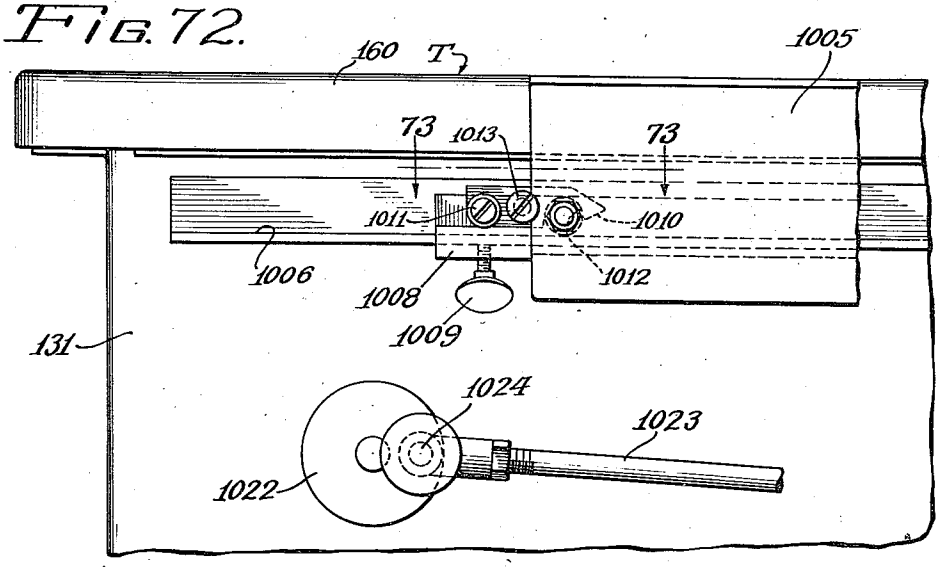
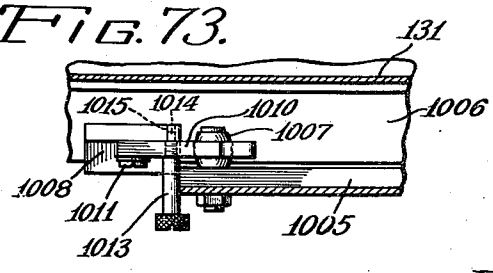


FIG. 73.



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Fig. 74.

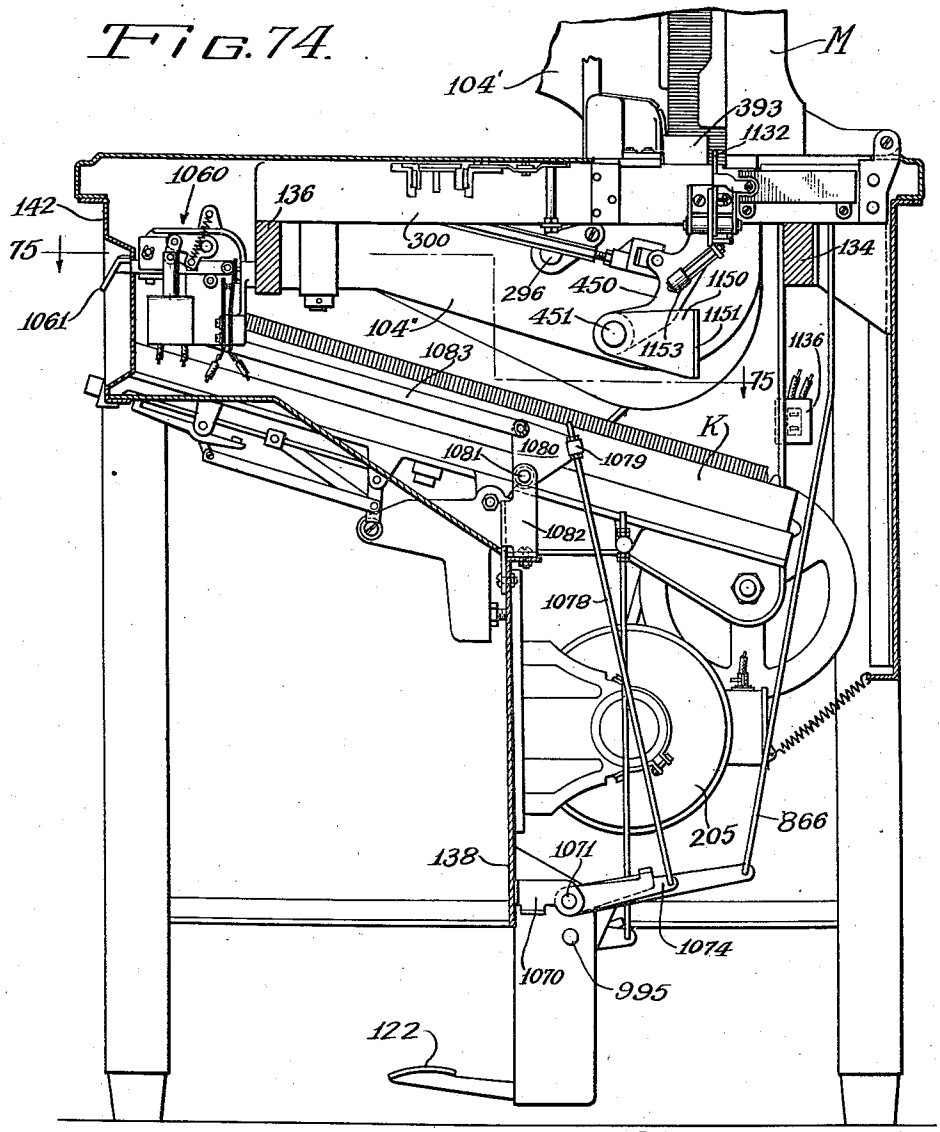
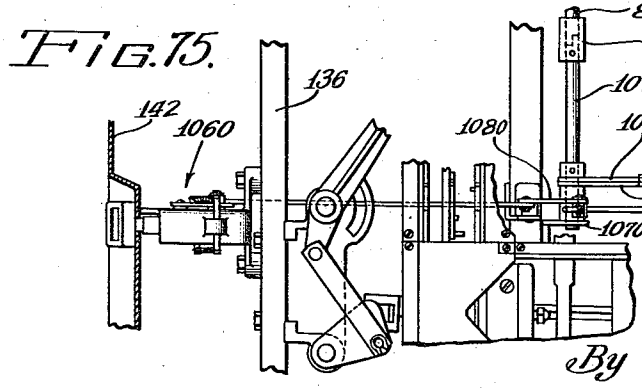


Fig. 75.



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FIG. 76.

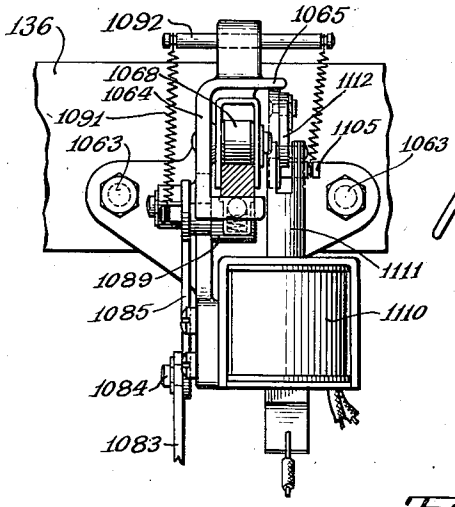


FIG. 77.

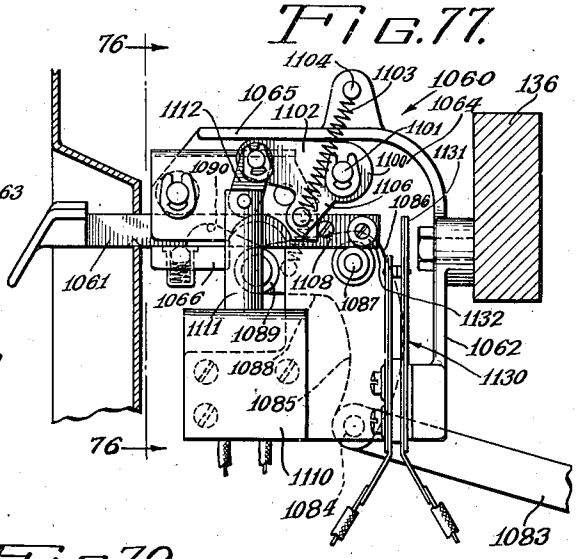


FIG. 79.

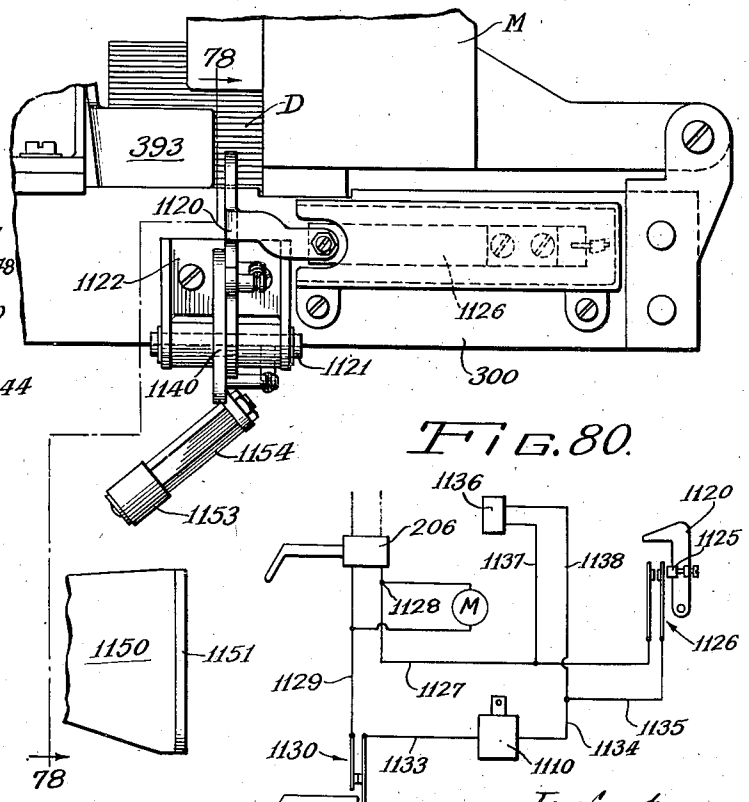
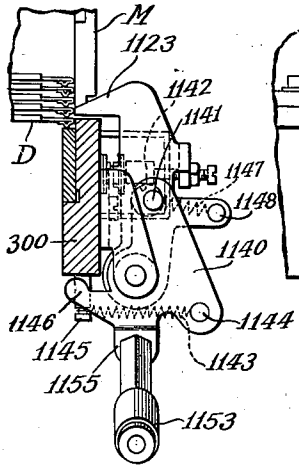


FIG. 78.



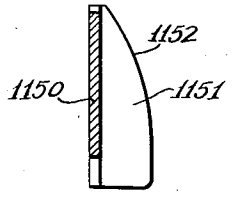


FIG. 80.

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Patented Oct. 10, 1944

2,359,850

UNITED STATES PATENT OFFICE

2,359,850

PRINTING MACHINE

Carl J. Hueber, East Cleveland, Ohio, assignor to Addressograph-Multigraph Corporation, Wilmington, Del., a corporation of Delaware

Application April 17, 1941, Serial No. 388,998

55 Claims. (Cl. 101—47)

This invention relates to printing machines through which a series of printing devices are fed to have impressions made therefrom onto sheets, envelopes, business forms and the like, and more particularly the invention relates to the feeding of the printing devices through such printing machines.

In printing machines of the aforesaid character the printing devices are introduced into a supply magazine and are withdrawn therefrom one by one and fed to a printing position where suitable printing means operates to make printing impressions on the sheets or the like from the printing devices located at the printing position. One or more printing impressions may be made from each of the printing devices, and the printing means is operated through a printing or impression-forming cycle each time such a printing impression is to be made.

The printing devices from which the printing impressions are made 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, business form or the like. While a wide variety of printing devices may be employed in machines of this character, the printing device disclosed in Mohler Patent No. 1,812,894, patented July 7, 1931, is typical of one form of printing device which may be employed. Another generally similar form of printing device adapted for use with the present invention is disclosed in Gollwitzer Patent No. 2,132,412, patented October 11, 1938. A printing device of this character includes a rectangular 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 on a so-called one-piece printing device of the kind disclosed, for example, in Duncan Patent No. 1,026,246, patented May 14, 1912, and devices of this character may be utilized with this invention. Furthermore, in some instances type characters are formed on suitable stencil paper, carried by a frame of cardboard or other material, and suitable means are provided in printing machines through which such devices are fed to apply ink on the type characters and afford a printing impression on a sheet or the like, and printing devices of this kind may be used with the present invention. Irrespective of whether the printing devices embody embossed type characters or type characters afforded in a stencil sheet were utilized in such machines, such printing devices are fed from a magazine to a printing position in a step-by-step manner such that printing impressions may be made from the successive printing devices upon a series of sheets, envelopes or the like or in succession upon a suitable business form or the like.

In printing machines of the aforesaid character the operator usually is seated in front of the printing machine and the machine is usually so designed that the printing position is located relatively close to the forward edge of the machine so that the sheets or the like may be fed automatically to printing position or so that the operator may position the sheets successively at printing position to receive impressions from the printing devices as such devices are successively advanced into printing position. Heretofore it has been the custom in machines of this character to locate the magazine either directly rearwardly of the printing position or directly laterally of printing position so that the printing devices were moved along a straight line path from the magazine to printing position. With either form of machine, it has been found that the relationship of the magazine to the printing position materially limits the range of usefulness of the machine, for the position of the magazine relative to the printing position either limited the size of the sheet that could be disposed in printing position or prevented the desired portion of the sheet from being disposed at printing position or in other ways interfered with the printing operation or locating of the printing impressions on the sheets.

Moreover, in those prior machines having an upstanding magazine located directly rearwardly of the printing position, it has been found that the range of use of the machines is restricted since such location of the upstanding magazine interfered with the mounting and operation of various forms of listing devices which have been provided for the purpose of imparting step-by-step movement to forms such as tax forms and the like which are often prepared in such machines; while in other prior machines, the upward projection of the magazine at one side of the machine interfered with automatic feeding of sheets and the like across the machine into and from printing position.

In view of the foregoing, an important object of the present invention is to enable relatively wide or long forms to be employed with printing machines of this character; and further objects

related to the foregoing are to enable relatively large clear areas to be provided on the table top of such machines along which relatively large sheets or forms may be moved in a straight line path past printing position; and to enable the throat beneath the printing or impression arm of such a printing machine to be relatively deep in a direction laterally of printing position as well as rearwardly of printing position.

Another object of the present invention is to enable the supply magazine in printing machines of this character to be located adjacent to one of the corners of the top of the printing machine thereby to provide a clear space rearwardly of the printing position which will enable relatively long and wide forms to be moved past printing position entirely to or beyond the rear edge of the machine when required.

Printing devices of the general character disclosed in the aforesaid Mohler and Gollwitzer patents are so constructed as to facilitate handling and storage of such devices and in particular, these devices are arranged to protect the operative printing faces of the type characters during storage of the printing devices in the storage drawers, during transfer of the printing devices to the magazine of a printing machine, during the removal of the printing devices one by one from the magazine, and during passage of the printing devices through the machine to the collector. In providing for such protection of the printing devices it is customary to form spacing flanges along the opposite end edges of the printing devices so that the spacing flange on any particular one of the printing devices will engage with flat end portions of the frame of the next adjacent printing device and thereby prevent contact with the operative printing faces of the type characters of this next adjacent printing device. When the printing devices are placed in position in the magazine of a printing machine, the spacing flanges are arranged to face or extend downwardly and thereby support the weight of the printing devices in the magazine. When the printing devices are to be removed from the magazine, the desired movement is imparted to the lowermost one of the printing devices along a path which is parallel to the spacing flanges so that the lowermost printing device is removed or advanced from the magazine in such a manner as to avoid scraping contact of the type faces with other printing devices in the magazine. Another important object of the present invention is to enable this advantageous mode of removing the printing devices from the magazine to be retained even though the magazine may be located in a laterally spaced relation to the printing position of the machine.

Another object of the invention is to enable printing and like devices to be advanced in a novel manner through printing machines; to advance such devices along a path throughout a portion of which the path of movement of the printing devices is disposed at right angles to the spacing flanges of the printing devices; to advance printing and like devices along a succession of angularly related straight line paths; to so relate such a succession of straight paths of movement in a printing device advancing means that the sensing of control means carried by such devices is facilitated; to so relate the printing device advancing to the sensing means in such a machine that the sensing means may be located in a position convenient for adjustment or inspection; to provide an advancing mechanism for printing devices in a machine of this character whereby the magazine for containing the supply of printing devices may be located in a convenient position for manually applying the printing devices to the magazine.

A further object is to enable the various frame elements and operative driving and control mechanisms of a printing machine of this character to be so constructed, arranged and disposed as to impart unusual adaptability and flexibility to the machine, thereby to increase its range of usefulness; and further objects related to the foregoing are to enable such printing machines to embody a desk-like frame within which most of the operating elements are effectually housed and protected; to group the manually settable control elements of the machine for convenient adjustment or setting by the operator; and to enable a printing machine of this character to be constructed in a basic or simplified model which may be economically manufactured and sold and which may be readily modified to incorporate additional operational features as required.

In printing machines of the character to which the present invention pertains, the feeding movement of the printing devices must be relatively rapid from station to station in the machine, and another object of the present invention is to enable such rapid movement of the printing devices to be effected without danger of displacing the removable printing plates from the frames of the printing devices; and another object related to the foregoing is to enable the printing devices to advance rapidly from station to station in the machine without danger of overfeeding or other undesirable disruption of the advancing movements.

A further object is to enable the printing devices to be accurately positioned at either the sensing station or the printing position in such a machine, and a further and related object is to provide for a preliminary positioning of each of the printing devices followed by a final positioning which accurately locates each printing device for either a sensing or a printing operation.

In the normal or usual operation of printing machines of the kind to which the present invention relates, a single printed impression is made from each printing device as it comes to rest at printing position, such procedure being termed "consecutive" operation. In certain instances, however, the user may desire to make two or more impressions from each printing device, and such operation may be automatically attained through automatic control means which operates sequentially to prevent advancing movement of the printing devices in predetermined machine cycles. Thus duplicate, triplicate or other multiple operation is attainable, and is generically termed "multiprint" operation of the machine. When a printing machine has its automatic control means set for multiprint operation, it is, of course, desirable that the predetermined number of impressions be made from each one of the printing devices, but in prior machines it has been found that with respect to the first and last printing devices of a series, the machines have often produced less than the desired number of impressions.

In view of the foregoing, another object of the invention is to insure that the multiprint mechanism of such a machine will invariably produce the intended and desired number of printed impressions from each printing device; and a further object related to the foregoing is to so relate

the automatic multiprint means to its adjusting or setting means that the setting or adjustment thereof may be varied only after the desired number of impressions have been made from a printing device. Further objects related to the foregoing are to so arrange the automatic multiprint control means that the elements thereof stand at rest when the machine is adjusted for other than automatic multiprint operation, thereby to insure that the automatic control means will function uniformly in the desired manner when the machine is again set for automatic multiprint operation; to so arrange the automatic control means that after periods of non-use, the first machine cycle after setting of the machine for multiprint operation will normally be the same type of machine cycle; to arrange the multiprint control mechanism so as to enable an unusually large number of impressions to be made automatically from each printing device; and to provide a novel and advantageous means for varying or changing the number of automatically attained printed impressions made from each printing device.

In a printing machine of this character the printing devices are normally placed in the magazine from a storage or filing drawer, and after the printing devices have been removed from a particular drawer, this drawer is placed in position at the discharge end of the printing device guideway so that after the performance of the printing operations from the printing devices, these printing devices are returned to the particular drawer from which they were removed. After a particular drawer has been refilled with printing devices, the drawer is removed from the printing machine and returned to its filing cabinet. It is undesirable, of course, to operate the printing machine when a storage or filing drawer is not in place in the machine, and another object of the present invention is to interrelate the collecting means of the printing machine with the other elements of the machine in such a manner that the printing devices cannot be advanced through the machine when a collecting drawer is not in proper position to receive the printing devices.

Other and further objects of the present invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings which, by way of illustration, show preferred embodiments and the principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other embodiments of the invention embodying the same or equivalent principle 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 perspective view illustrating a printing machine embodying the features of the invention;

Fig. 2 is a plan view of the machine shown in Fig. 1 with a portion of the top of the machine broken away to illustrate a part of the actuating mechanism;

Fig. 3 is a plan sectional view taken just above the table top of the machine and having the table top removed to show details of internal construction;

Fig. 4 is a vertical setcional view of the machine taken along the line 4—4 of Fig. 3;

Fig. 5 is a fragmental vertical sectional view taken along the line 5—5 of Fig. 3;

Fig. 6 is an enlarged fragmental vertical sectional view substantially similar to Fig. 5;

Fig. 7 is a fragmental plan view of the operating or actuating mechanism illustrated in the left-hand portion of Fig. 3;

Fig. 8 is an enlarged plan sectional view which fragmentally illustrates the mechanism shown in the right-hand portion of Fig. 3;

Fig. 8A is a fragmental perspective view taken from the right-hand forward corner of the machine and showing the mechanism thereof as it appears when the table top of the machine is removed;

Fig. 9 is a fragmental vertical sectional view taken along the line 9—9 of Fig. 8 and illustrating a part of the printing device advancing means in its normal or at rest position;

Fig. 10 is a view similar to Fig. 9 and illustrating the same portion of the printing device advancing means as it appears when it is at the end of its forward or advancing stroke;

Fig. 11 is an enlarged fragmental sectional view taken along the line 11—11 of Fig. 8 and illustrating the relationship of certain parts of the printing device guiding and advancing means;

Fig. 12 is a vertical sectional view taken along the line 12—12 of Fig. 8 and further illustrating the relationship of the initial portion of the printing device guiding and advancing means;

Fig. 13 is a perspective view illustrating in a fragmental and exploded relationship the structural elements which are united to form the initial portion of the printing device guiding and advancing means;

Fig. 14 is an enlarged fragmental plan view illustrating the terminal portion of the initial printing device guideway and its manner of association with the intermediate printing device guideway;

Fig. 15 is a fragmental vertical sectional view taken along the line 15—15 of Fig. 14;

Fig. 16 is a fragmental vertical sectional view taken along the line 16—16 of Fig. 14;

Fig. 17 is a fragmental vertical sectional view taken along the line 17—17 in Fig. 14 and showing the intermediate printing device advancing means in its normal or at rest position wherein it has come to rest at the end of its advancing stroke;

Fig. 18 is a view similar to Fig. 17 and illustrating the intermediate printing device advancing means after it has partially completed its retracting or idle stroke toward the right;

Fig. 19 is a view similar to Figs. 17 and 18 and showing the intermediate printing device advancing means after it has completed its retracting stroke and has started upon its active or advancing stroke to the left;

Fig. 20 is a fragmental vertical sectional view taken along the line 20—20 of Fig. 25 and showing the relationship of the intermediate printing device guideway to the final printing device guideway;

Fig. 21 is a fragmental vertical sectional view taken along the line 21—21 of Fig. 8 and illustrating the printing device advancing means of the initial guideway at the end of its forward or advancing stroke;

Fig. 22 is a fragmental vertical sectional view taken along the line 22—22 of Fig. 3 and showing the details of a portion of the intermediate printing device guideway;

Fig. 23 is a fragmental vertical sectional view

taken along the line 23—23 of Fig. 3 and showing the details of another portion of the intermediate guideway;

Fig. 24 is a perspective view illustrating the retarding mechanism which is associated with the intermediate printing device guideway and prevents retrograde movement of the printing devices therein;

Fig. 25 is an enlarged plan view illustrating the juncture of the intermediate and final printing device guideways;

Fig. 26 is an enlarged fragmental vertical sectional view taken along the line 26—26 of Fig. 25;

Fig. 27 is an enlarged fragmental vertical sectional view taken along the line 27—27 of Fig. 25;

Fig. 28 is a vertical sectional view taken along the line 28—28 of Fig. 8;

Fig. 29 is a plan view showing the operative or printing face of a printing device adapted to be employed with the machine of the present invention;

Fig. 30 is an elevated view of the lower edge of the printing device shown in Fig. 29;

Fig. 31 is an elevational view of the reverse side of the printing device;

Fig. 32 is a fragmental plan view of some of the parts embodied in the printing device guideway;

Fig. 33 is a fragmental plan view showing the parts of Fig. 32 in their operative association with other elements of the printing device advancing and guiding means;

Fig. 34 is a fragmental vertical sectional view taken along the line 34—34 of Fig. 33 and illustrating the construction of the parts at the juncture of the intermediate and final printing device guideway;

Fig. 35 is a perspective view illustrating the parts which make up the intermediate printing device guideway and advancing means in an exploded relationship;

Fig. 36 is a fragmental vertical sectional view taken along the line 36—36 of Fig. 7 and illustrating the association of the final printing device guideway with the collecting means in which the printing devices are deposited or filed after the printing operations;

Fig. 37 is a fragmental vertical sectional view taken along the line 37—37 of Fig. 25 and illustrating the final printing device advancing means in its normal position wherein it has come to rest at the rear end of its return or inactive stroke;

Fig. 38 is a view similar to Fig. 37 illustrating the elements of the final printing device advancing means in the positions which they assume at the end of their active or forward stroke;

Fig. 39 is a fragmental vertical sectional view taken along the line 39—39 in Fig. 25 and illustrating a portion of the final printing device advancing means in its at rest position;

Fig. 40 is a fragmental vertical sectional view taken along the line 40—40 of Fig. 25 and further illustrating a portion of the final printing device advancing means in its at rest position;

Fig. 41 is a fragmental vertical sectional view taken along the line 41—41 of Fig. 25 and further illustrating the mechanism of Fig. 40;

Fig. 42 is a perspective view showing the parts which make up the final printing device guiding and advancing means, these parts being shown in an exploded relationship;

Fig. 43 is an enlarged fragmental view showing the initial, intermediate and final printing device advancing and guiding means with a series of printing devices in the guideway and with the advancing means in its normal or at rest position;

Fig. 44 is a view similar to Fig. 43 and showing the printing device advancing means after it has completed a portion of its operative advancing movement;

Fig. 45 is a view similar to Fig. 43 and showing the printing device advancing means after the completion of the advancing movement in the initial and final printing device guideways and just ready to start the advancing movement of the printing devices in the intermediate guideway;

Fig. 46 is a view similar to Figs. 43 to 45, inclusive, and showing the printing device advancing means after it has completed a portion of the advancing movement of the printing devices in the intermediate guideway;

Fig. 47 is a fragmental vertical sectional view taken substantially along the line 47—47 of Fig. 48 and illustrating the construction and relationship of certain of the actuating and control elements of the machine;

Fig. 48 is a vertical sectional view taken along the line 48—48 of Fig. 47;

Fig. 49 is a fragmental vertical sectional view taken along the line 49—49 of Fig. 47;

Fig. 50 is a perspective view of the rear side of the machine with a part of the table top removed and with the back cover of the machine removed so as to show portions of the operating and control mechanism of the machine;

Fig. 51 is a fragmental perspective view taken from the left-hand rear corner of the machine and illustrating the mounting and relationship of certain elements of the actuating and control mechanism of the machine;

Fig. 52 is a plan view of the main drive mechanism of the machine;

Fig. 53 is a fragmental vertical sectional view illustrating a portion of the main drive mechanism and taken along the line 53—53 of Fig. 52;

Fig. 54 is a fragmental vertical sectional view taken along the line 54—54 of Fig. 52 and illustrating the relationship of certain elements of the main drive mechanism;

Fig. 55 is a fragmental horizontal sectional view taken along the line 55—55 of Fig. 54 and illustrating the main drive shaft and the connections associated therewith;

Fig. 56 is a vertical sectional view showing another portion of the actuating and control mechanism and taken substantially along the line 56—56 of Fig. 52;

Fig. 57 is a fragmental vertical sectional view illustrating another portion of the actuating and control mechanism and taken substantially along the line 57—57 of Fig. 52;

Fig. 58 is a fragmental vertical view taken along the line 58—58 of Fig. 52 and illustrating another portion of the actuating and control mechanism;

Fig. 59 is a fragmental plan sectional view taken along the line 59—59 of Fig. 58;

Fig. 60 is a fragmental vertical sectional view illustrating the control mechanism whereby the number of printing operations to be made from a particular device is ordinarily controlled;

Fig. 61 is a fragmental portion of Fig. 60 illustrating the parts thereof in a different portion of their operating cycle;

Fig. 62 is a view similar to Fig. 60 illustrating the parts in another position of adjustment;

Fig. 63 is a view illustrating the mechanism in the adjusted position of Fig. 62 but showing the parts thereof in a different portion of their cycle;

Fig. 64 is a view illustrating the control mechanism in the same position of adjustment as in Fig. 62 but showing the parts in a different relationship;

Fig. 65 is a sectional view taken along the line 65—65 of Fig. 64;

Fig. 66 is a plan sectional view taken along the line 66—66 of Fig. 64:

Fig. 67 is a view illustrating the control mechanism in another position wherein the printing device advancing means is disabled;

Fig. 68 is a plan sectional view taken along the line 68—68 of Fig. 67;

Fig. 69 is a fragmental plan view similar to Fig. 3 and illustrating the mechanism whereby a sheet feeding means may be operatively associated with the present machine;

Fig. 70 is a fragmental vertical sectional view taken substantially along the line 70—70 of Fig. 69;

Fig. 71 is a fragmental vertical sectional view taken substantially along the line 71—71 of Fig. 70;

Fig. 72 is a fragmental elevational view of the left-hand end of the machine illustrating the manner in which a sheet feeding means may be operatively associated with the printing machine;

Fig. 73 is a fragmental plan sectional view taken along the line 73—73 of Fig. 72;

Fig. 74 is a vertical sectional view taken through the printing machine and illustrating an automatic control means which may be incorporated in the machine to produce continuous operation of the machine and to stop the machine automatically upon detection of predetermined certain circumstances or undesired conditions;

Fig. 75 is a fragmental plan view taken along the line 75—75 of Fig. 74;

Fig. 76 is a fragmental vertical sectional view taken along the line 76—76 of Fig. 77;

Fig. 77 is an enlarged fragmental portion of Fig. 74;

Fig. 78 is a fragmental vertical sectional view taken along the line 78—78 of Fig. 79;

Fig. 79 is an enlarged fragmental portion of the mechanism shown in Fig. 74; and

Fig. 80 is a schematic wiring diagram of the control circuits embodied in the control mechanism illustrated in Figs. 74 to 79, inclusive.

The machine generally

In the form chosen for disclosure herein the invention is embodied in a printing machine having a desk-like frame 100 providing a table top T on which sheets such as envelopes, letter-heads, bill forms, ledger sheets and the like may be disposed for the performance of printing operations thereon. The printing operations are performed in this machine from printing and like devices such, for example, as the printing device D shown in Figs. 29 to 31, inclusive, which are advanced, one by one, from a supply magazine M to a printing position V located adjacent the forward edge 101 of the table top T, and are thereafter discharged into a collector means such as a drawer K. When a printing device D is located at printing position with a sheet or form located thereover on the table top T, the printing impression is made from the printing device onto the sheet by means including a platen mechanism P which is actuated through an operative printing cycle each time a printing operation is to be performed. The platen mechanism P is supported over the printing position and in upwardly spaced relation to the table top T by means of a printing frame 104 which is described in detail in my co-pending application Serial No. 350,678, filed August 3, 1940, now Patent No. 2,275,439, patented March 10, 1942. The printing frame 104 is generally C-shaped in form and is stationarily mounted in the frame 100 so that the connecting portion 105 extends upwardly through the table top T, thereby locating the upper arm 104' above and in spaced relation to the table top T while a lower arm 104'' is located beneath the table top T. The ends of the arms 104' and 104'' are disposed in opposed spaced relation so that the lower arm 104'' may support an anvil A, which forms a part of the means defining the printing position and upon which the printing devices D come to rest for the performance of a printing operation.

The opposed end of the upper arm 104' serves to support the platen mechanism P and for this purpose is provided with a head casting 108 upon which the platen mechanism P is carried. In so far as certain aspects of the present invention are concerned, the particular form and mode of support and operation of the platen mechanism P are immaterial, but I prefer to employ geared roller plan mechanism of the general type disclosed in my aforesaid co-pending application Serial No. 361,530, filed October 17, 1940, and reference may be had to this co-pending application for details of construction and operation of the platen mechanism. Generally considered, however, this platen mechanism includes a carriage C mounted for reciprocation in a direction from front to rear of the machine along a supporting plate or track 109 which is adjustably mounted on the lower face of the head casting 108. The carriage C has a platen roller PR mounted thereon by extensible mechanism such as toggle links 110 so that the platen roller PR may be lowered into an operative relation with respect to a sheet and a printing device D for the purpose of producing a printed impression on the sheet from the printing device D. Such lowering of the platen roller PR into an operative position, as well as the retraction of the platen roller PR to an elevated or inactive position, takes place as an incident to the reciprocatory movement of the carriage C, and such lowering and raising of the platen roller PR may be accomplished by means including a link 111, the construction and operation of which means is fully described in said co-pending application Serial No. 361,530.

The printing devices D employed in the machine of the present invention may take many different forms, such for example as the stencil type having a panel of stencil paper carried in a suitable cardboard or metallic frame and embodying type characters formed in the stencil paper thereof; or the desired type characters may be formed by an embossing process in a metallic plate which may in some instances be provided with a metallic holder or frame. The machine illustrated herein is particularly designed for the use of embossed metallic printing plates and an illustrative embodiment of one such printing device D is shown in detail in Figs. 29 to 31, inclusive, of the drawings. This printing device D may be of the construction shown in Mohler Patent No. 1,812,894, patented July 7, 1931, or of the construction shown in the Gollwitzer Patent No. 2,132,412, patented October 11, 1938.

When a sheet or form, and a printing device D, are in their proper relation at printing position, an inked ribbon IR is located therebetween so that printing pressure imparted to the sheet by the platen roller PR serves to produce a printed impression from the embossed type of the printing device D through the inked ribbon IR and onto the sheet or form.

As shown in Figs. 29 to 31, inclusive, the printing device D comprises a rectangular frame 112 having a printing plate 113 of embossable metal removably held in position along the lower portion of one face thereof. The printing plate 113 is mounted in position on the frame 112 by endwise insertion into a guideway provided by a reversely curled lower edge 113' formed on the frame 112 and a plurality of curled lugs 113'' struck from the body of the frame 112. The printing plate 113 is held on the frame 112 against endwise displacement by means of yieldable spring latches 114 which are struck from the frame 112 and are formed to releasably engage the opposite ends of the printing plate 113. Along the upper edge of the same face of the frame 112 an index card 115 is preferably positioned by means of a rolled upper edge 115' and retaining lugs 115''; and an index impression 116' may be printed on the card 115 from the type characters 116 embossed on the printing plate 113. Such embossure of the type characters 116 may be accomplished by means of the embossing machine illustrated and described in Duncan Patent No. 1,518,904, patented December 9, 1924. Along its upper edge the frame 112 is preferably formed with a plurality of sockets 117' in which indicating or selecting means such as tabs 117 may be selectively positioned for purposes well understood in the art. Along its opposite ends the frame 112 is reversely bent so as to provide transversely extending spacing flanges 118 which extend parallel to each other along opposite ends of the frame and project from the lower or rear face (Fig. 30) of the frame. When printing devices D of this construction are stacked in a magazine M, the smooth upper surfaces 112' formed along the ends of the upper surface of the frame 112 of the lowermost printing device D are engaged by the spacing flanges 118 of the next higher printing device, so that objectionable contact of this next higher printing device D with the type characters of the lowermost device D is avoided.

When a printing device D is in printing position it rests beneath the inked ribbon IR with its type characters 116 facing upwardly and with that portion of the lower face of the frame 112 which is located between the spacing flanges 118 resting upon the anvil A. The lines of type 116 are then disposed parrallel to the forward edge 101 of the table top T, and the spacing flanges 118 extend perpendicular to the forward edge 101 and project downwardly into recesses or grooves 119 (Figs. 6 and 25) formed in the anvil so that the frame 113 is firmly bedded upon the anvil A. When the printing device D is thus positioned, and a sheet is located thereover, the platen carriage C is advanced forwardly through a conditioning stroke in the course of which the platen roller PR is automatically lowered to its operative position as described in detail in my aforesaid co-pending application Serial No. 361,530. This conditioning movement serves to bring the resilient platen face PF of the platen roller PR into an operative engagement with the sheet just forwardly of the most forward line of type of the printing device D, so that in the rearward or operative stroke of the platen carriage C the platen face PF by reason of a geared interrelation with the reciprocatory movement of the carriage, will roll rearwardly over the sheet, and produce the desired printing impression from the several lines of type characters 116 onto the sheet or form. At or near the rearward extent of the platen carriage stroke, the platen roller PR is withdrawn to its inactive position so that a new sheet may be put in place at printing position. If desired, such location of the sheet at printing position may be facilitated by one or more sheet stops or guides G such as those illustrated in Fig. 1.

In the printing machine herein disclosed the disposal of the several elements which must be mounted on or above the table top T is such that the machine may be used throughout a wide variety of printing operations which have heretofore been difficult to perform upon prior printing machines of this general character. To this end the printing frame 104 is disposed generally in a vertical plane lying at a substantial acute angle to the forward edge 101 of the table top T, this angle in the present instance being substantially 45°, and with this arrangement, as will be evident from a consideration of Figs. 1, 2 and 4, the vertical column-like portion 105 of the printing frame 104 is located laterally of the printing position so as to provide a continuous open space along the table top T from front to rear of the table top and of a considerable width laterally of the machine. Hence, the machine may be used to perform printing operations upon relatively wide forms or ledger sheets which must, during the printing operation, extend a considerable distance to the right from the printing position, and in addition, the rear portion of the table top immediately rearwardly of the printing position is left unobstructed so as to enable single or multiple column listing devices to be mounted along the rear of the table top when required; and when so mounted the listing devices are readily accessible for the operative connection of sheets or forms thereto. One form of listing device which is adapted for operative association with the present machine is illustrated and claimed in my co-pending application Serial No. 410,097, filed September 8, 1941.

This acute angular location of the printing frame 104 also provides a deep throat under the arm 104' in a direction from front to rear of the machine and in those instances when a form or sheet is of such a width that it will not pass rearwardly along the left-hand side of the vertical portion 105 of the printing frame (Figs. 1 and 2), the form may be rolled into a cylinder along a line parallel to the front edge 101 and just forwardly of the vertical member 105; and in order that the capacity of the machine in this respect may be exceptionally large, the area of the table top which is located forwardly of the vertical portion 105 of the printing frame is maintained unobstructed in front of the portion 105 and entirely to the adjacent end such as the right-hand end 116 of the table top T. In order that these unobstructed areas or working spaces may be provided on the table top T, the present invention provides means for advancing the printing devices D to printing position along a novel and rather complex path such that the magazine M may be located at one side of the vertical portion 105 of the printing frame 104. Thus, as shown in the present embodiment, the

magazine M is located to the right (Figs. 1 and 2) of the vertical portion 105 of the printing frame 104, and preferably this location is spaced substantially rearwardly from the front edge of the vertical member 105 so as to provide space forwardly of the magazine wherein a sensing means such as a selector bar S may be located above the table top T without obstruction of the desired clear area of the table top T.

The printing machine herein illustrated is adapted for use by an operator seated immediately forwardly of the forward edge 101, in much the same manner as a typist is seated at a typewriting desk, and the most frequently required control operations are performed by means of a series of foot pedals 120, 121 and 122 which are disposed beneath the desk-like frame in position to be conveniently actuated by an operator seated in front of the desk-like frame. Thus, an operator, while seated in front of the machine, may initiate a normal printing operation through depression of the foot pedal 122, as will hereinafter be explained in detail, and in the course of such normal printing operation, the platen mechanism P operates through a printing cycle, and a printing device advancing operation takes place. Hence, when the machine is adjusted for normal or conventional operation and the foot pedal 122 is successively depressed or actuated, a succession of printing operations are performed from a succession of different printing devices D. When, however, the operator wishes to skip a particular printing device D, the skip pedal 120 may be depressed to effect a printing device advancing operation while the platen mechanism P remains inactive. Under other circumstances, where the operator wishes to make more than one printing impression from a particular printing device D, the repeat pedal 121 is depressed, thereby to cause operation of the platen mechanism P while allowing the printing device advancing mechanism to remain inactive.

An operator while seated in normal working position in front of the present machine, may also perform other frequently required control operations or adjusting operations, such, for example, as the adjustment of printing pressure. This adjustment is accomplished by manipulation of a conveniently positioned adjusting knob 124 located at the right-hand side of the head forging 108 and operating in the manner described in my aforesaid co-pending application Serial No. 361,530 to effect gradual vertical adjustment of the mounting plate 109 and the platen carriage C. Other operational or set-up adjustments may also be performed by the operator from normal working position as will be hereinafter described in detail.

Frame construction

The desk-like frame 100 is preferably constructed principally from sheet metal to provide similar end panels 130 and 131 having downwardly projecting legs 130' and 131', respectively, which may be formed integrally with their end panels 130 and 131 if desired so as to extend upwardly along the front and rear edges of the panels and thereby provide rigidity in the end panels. Along their inner or adjacent faces the end panels 130 and 131 have reinforcing channels 132 (Figs. 3 and 5), disposed horizontally and relatively close to the upper edge of the panels, and these reinforcing channels 132 are employed in mounting a pair of connecting or mounting bars 134 and 136 between the two end panels 130 and 131. These two connecting bars 134 and 136, in addition to their function in connecting the two end panels 130 and 131 together, serve as a supporting or mounting means for most of the operating or relatively heavy elements of the present machine. The mounting of the bars 134 and 136 is such that the bars rest at their opposite ends upon the projecting upper flanges of the channels 132 and the bars are held in proper lateral relationship on the channels 132 by means of securing members 133. Each securing member 133 is in the form of a stamping having end flanges 133' and a bottom flange 133''. The bottom flange 133'' of each securing member 133 rests on the upper flange of the associated channel 132 and the body portion of the securing member 133 rests against the end panel and is secured in fixed relation thereto as by welding. Thus the securing members are in a fixed relationship with respective panels and adjacent ends of the bars 134 and 136 are secured to the securing members by means of bolts 135.

Rigidity is provided in the assembly by an intermediate wall structure which connects the two panels 130 and 131 intermediate the front and rear legs thereof. As shown in Fig. 1, this intermediate wall structure comprises a vertically positioned skirt 138 preferably formed from a panel of sheet metal and located considerably rearwardly from the forward edges of the end panels 130 and 131. At its upper end the skirt 138 merges with and is connected to a forwardly and upwardly extending wall section 140 which at its forward edge merges with and is connected to a sectional front panel 142. The front panel 142 is substantially aligned with the forward edges of the two end panels 130 and 131 and, within recessed portions 142', provides for convenient mounting of various control means which may be employed in setting up and governing the operation of the present machine. A back panel 144 may also be formed from sheet metal and removably secured in the space between the rear legs 130' and 131' of the end panels as by means of screws (not shown) which are connected to angle brackets 144' on the rear legs, thereby enclosing considerable space within the frame 100 so that the operating or actuating mechanism of the printing machine may be housed within this enclosure. The rear wall 144 is also bolted to a relatively rigid bracket 144'' which, as shown in Fig. 3, projects rearwardly from the rear supporting bar 134, this bracket 144'' serving, in some embodiments of the machine, to provide a rigid mounting for attachments such as strip listers, two-column listers or the like. As shown in Figs. 1 and 4, the side panels 130 and 131 terminate at lower edges 146 which are spaced upwardly a considerable distance from the floor, and preferably the skirt 138 also terminates at a lower edge 138' which is similarly spaced from the floor. With this construction the several control pedals 120, 121 and 122 are mounted on the lower ends of supporting members 148 which are fixed to and depend from the lower edge of the skirt 138. The end panels 130 and 131, the front panel 142 and the back panel 144 are provided with outwardly extending horizontal mounting flanges 149 along their upper edges, as shown in Figs. 3 and 4, to which the table top T is secured. In the preferred form herein shown the table top T is sectional in form, as indicated in Figs. 1 and 2, and those edges of the several sections which are to constitute outer edges of the table top are

rolled or formed downwardly and then inwardly, as illustrated in Fig. 4, so as to provide relatively thick rounded edges for the table top with inwardly extending horizontal flanges to rest on and be secured to the flanges 149 as by means of bolts.

In the form herein shown the table top T comprises a number of separate sections, several of which are adapted for individual removal so as to expose different portions of the internal structure or mechanism. Thus, as illustrated in Fig. 2, a right-hand top section 160 is located along the right-hand end portion, to the right of the magazine M and sensing means S and extends from front to rear of the frame. A generally similar section 161 is provided along the left-hand end, and these two sections 160 and 161 may, if desired, be permanently mounted since convenient access to the interior of the frame 100 may be had through removal of the other sections of the top T. Between the two top sections 160 and 161, a removable top section 162 is provided, this section 162 extending from the front edge 101 to the forward edge of the sensing means S. In the space rearwardly of the section 162 and to the left (Fig. 2) of the portion 105 of the printing frame, the table top T is formed by a removable section 163; while between the section 163 and the end section 160, a section 164 is provided which fits about the base of the magazine M and the portion 105 of the printing frame 104.

The section 162 of the table top T includes that area of the top in which the printing position is located, and in this area therefore the section 162 is cut away, as shown in Figs. 1, 4 and 6, to provide for the mounting of a sectional resilient shield 165 over the area in which printing operations are performed. The shield 165 has front and rear sections 165' and 165'', respectively, which cooperate in defining a printing opening 166 over the anvil A. In the form herein shown the shield 165 also defines an auxiliary printing opening 166' located to the left of the opening 166 in Fig. 1, and overlying an auxiliary printing device 167 which may cooperate with an auxiliary platen face PF—2 on the platen roller to perform additional printing operations such as the printing of a date, signature or the like whenever the platen operates through a printing stroke.

The section 162 of the table top T may also be provided with a mounting rail 168, as shown in Figs. 1 and 2, along its forward edge for use in mounting attachments on the machine. In order that the rail 168 may be readily squared or aligned in certain uses of the machine, adjustable supporting screws 168' are employed in mounting the rail 168 on the forward edge of the section 162 of the table top T. As herein shown, a pair of side guides G are adjustably secured to the rail 168 by thumb screws 169, these guides being used in certain instances to determine the lateral positioning of the sheet or form at printing position.

The printing frame mounting

As hereinbefore pointed out, the two bars or rails 134 and 136 serve as the primary support for most of the relatively heavy structural and operating parts of the present printing machine, and among the parts thus supported are the printing frame 104 and a main drive or actuating assembly 180 (Fig. 2). The printing frame 104 is preferably of the construction illustrated in my aforesaid co-pending application, Serial No. 350,678, filed August 3, 1940, and has a bracket 181 fixed on the rear side of its vertically extending portion 105 (Figs. 3 and 8) and resting on and bolted to the rear supporting bar 134. At its forward end the lower arm 104'' of the printing frame 104 has an anvil mounting bar 182 secured thereto, as by welding (Figs. 37 and 38), and the anvil mounting bar 182 is arranged to rest upon the forward supporting bar 136. Beneath the anvil mounting bar 182 a stiffening plate 183 (Figs. 36 to 39) is secured as by welding to the bar 182 and the forward edges of the lower arm 104'', and the plate 183 is so located as to abut the rear vertical face of the supporting bar 136. The plate 183 is in the present instance utilized for securing the forward end of the printing frame 104 in position, this function being accomplished by bolts 185 passing through the plate 183 and the bar 136, as illustrated in Figs. 4, 6 and 20. The anvil A is, in turn, secured in position on the top of the mounting bar 182 by means of a plurality of headed screws 186, which extend upwardly through the bar 182, as shown in Fig. 36, and are threaded into the bottom of the anvil A.

The main drive mechanism

The main actuating assembly 180 of the present machine is located in the generally triangular space rearwardly of the lower arm 104'' of the printing frame; and the actuating assembly 180 includes a drive shaft 200 rotatably mounted in a horizontal position immediately forwardly of the rear supporting bar 134 by means of a plurality of bearing brackets 201, 202 and 203 each of which is bolted to and carried by the bar 134. Adjacent the left-hand end (Fig. 3) of the shaft 200 a constantly rotating source of power such as a pulley 204 is provided, the pulley in the present instance being rotatably mounted on the shaft 200. During periods of use of the printing machine the pulley 204 is constantly driven by means such as an electric motor 205, there being a suitable speed reducing drive connection between the motor 205 and the pulley 204. The motor 205 is controlled by a switch 206 mounted within the frame behind the panel 142, as shown in Fig. 8A, and this switch is actuated and controlled by means of a control slide 207 (Fig. 1) which extends forwardly through the panel 142 and into the central recess 142' thereof. The control slide 207 is so arranged that when the slide is positioned inwardly the motor 205 is stopped, and when the slide is pulled outwardly the switch 206 is closed and the motor is started. In the present instance the motor 205 is mounted on the rear side of the skirt 138, and the desired speed reducing drive is attained through a belted drive connection.

The mounting for the motor 205, which is best illustrated in Figs. 4, 47, 48 and 50, comprises a pair of spaced vertical channel members 208 secured as by welding to the back of the skirt 138 and having keyhole slots 209 formed therein to receive and support the heads of mounting bolts 210 which support a motor mounting bracket 211. The bracket 211 is preferably formed from sheet metal to provide a body or base portion 211' with projecting arms 211'' at opposite ends thereof. The base portion 211' has vertical slots 212 therein through which the bolts 210 extend, and by clamping of nuts 213 on the bolts 210, the height of the bracket 211 may be adjusted. The arms 211'' are formed at their ends to provide relatively large arcuate recesses or notches 215 adapted to

embrace one side of resilient rubber mounting sleeves 216 which surround the axially projecting bearing hubs 217 of the motor 205. To hold the motor in position on the bracket, each arm 211'' has projecting lugs 218 formed thereon adjacent the upper and lower ends of the recesses 215, and metallic clamping straps 219 are attached to or hooked about these lugs 218 so as to extend therefrom about the remote side of each sleeve 216 as shown in Fig. 48. The adjacent ends of the straps 219 have outwardly bent lugs 220 thereon, and by means of a clamping screw 221 extending between the lugs 220 the sleeves 216 are held in position in the recesses 215.

The speed reducing belted drive connection between the motor 205 and the pulley 204 is best shown in Figs. 4, 47, 48, 50, 54 and 55, and comprises a small pulley 230 fixed on the motor shafts and connected by a belt 231 to a large pulley 232 which is rotatably mounted on a bearing stud 232' carried on a mounting plate 233. The mounting plate 233 is generally triangular in form and is located in a vertical plane. Along most of its edges the plate 233 is flanged, and at its upper rear edge the rear flange of the plate 233 is secured by means of bolts 234 to the rear supporting bar 134. At its forward corner the plate 233 rests upon and is bolted to the upper flange of the skirt 138 by means of a bolt 233' so as to be supported thereby, while suitable side bracing is provided by a brace rod 235 extending from a lower portion of the rear edge of the plate 233 angularly upwardly and bolted to the bar 134 as shown in Fig. 47. A small pulley 236 mounted on the stud 232' and rigid with the pulley 232 is connected by a belt 237 to a large pulley 238 rotatably mounted on a bearing stud 238' projecting from the plate 233; and rigid with the pulley 238 is a double pulley 239 of small diameter which is connected by a pair of parallel belts 240 to the pulley 204.

Thus the pulley 204 is constantly driven at reduced speed during the operation of the motor 205, and this constantly available source of driving power is, through the medium of properly interrelated actuating and control mechanism, utilized to actuate the various operative parts and mechanisms of the machine. In the present machine it is often desirable that certain mechanism or groups of mechanisms be capable of operation independently of certain other mechanisms or groups of mechanisms, as for example, in what is known as "multiple" or "repeat" operation of the machine where the platen mechanism P is to be operated through a plurality of printing operations while the same printing device D remains stationary at printing position; or as another instance, in what is known as "skip" operation of the machine wherein the platen mechanism P remains inoperative while one or more printing devices D are passed through printing position. In order that such selective operation may be attained a plurality of independently connectible driving connections are provided in association with drive pulley 204 and the shaft 200, such selective driving connections in the present instance being provided through the medium of a plurality of one-revolution clutches 250, 251 and 252 disposed at spaced points along the shaft 200, as shown in Figs. 54 and 55.

The clutch 250, as shown in Figs. 53, 54 and 55 constitutes a main or master clutch and is utilized to connect the pulley 204 to the shaft 200 so as to rotate the shaft through one revolution each time some portion of the mechanism is to be actuated, while the clutches 251 and 252 constitute secondary clutches and are operatively associated respectively with the printing device advancing means and the platen mechanism P. The secondary clutches 251 and 252 are so arranged that they may be selectively utilized to connect the printing device advancing mechanism or the platen mechanism individually or concurrently to the shaft 200 for actuation thereby. The master clutch 250, as herein shown, comprises a constantly rotating driving member in the form of a sleeve 255 rotatably mounted on the shaft 200 and serving as a mounting for the pulley 204 to which it is keyed as indicated at 256 in Fig. 54. At the right end of the driving member 255 (Fig. 54), the clutch 250 has a driven member in the form of an enlarged hollow hub 257 (Fig. 53) which is pinned on the shaft 200. Within the driven member 257 a clutch dog 258 is pivoted at 258a so that a clutch tooth 259 formed on one end of the dog 258 may be moved into operative engagement with a recess or notch 260 formed in the driving member 255. The clutch dog 258 is urged toward such operative or engaged relation by means of a spring 261 acting between the dog 258 and an anchoring pin within the hollow hub 257, and when the tooth 259 is thus engaged with the notch 260, the hub 257 and the shaft 200 are driven with the pulley 204.

The other end of the clutch dog 258 projects beyond the pivot 258a for a considerable distance and has a stop tooth 263 projecting therefrom in a generally radial direction with respect to the shaft 200 so as to project outwardly through a slot 264 formed in the hollow hub 257. When the clutch tooth 259 has been engaged with a notch 260 in the driving member 255, rotation of the driven member 257 is initiated in a clockwise direction as viewed in Fig. 53, and such rotation continues throughout substantially one revolution, at which point the projecting stop tooth 263 moves into engagement with a stop means such as a stop lug 270' formed on a stop lever 270 which restrains the stop tooth 263 against further movement and thereby causes the clutch dog 258 to be pivoted so as to withdraw the clutch tooth 259 from the notch 260 in the driving member 255. The rotation of the driving member 255 may then continue, but the driven member is stopped in a predetermined angular relationship and is restrained against further rotation in a clockwise direction until such time as the stop lever 270 is withdrawn from its restraining relationship with respect to the stop tooth 263. The particular manner in which the stop lever 270 is mounted, actuated and controlled will be described in detail hereinafter in connection with the description of the operative interrelationship of the several operative mechanisms of the machine.

The clutch 251, which controls the operation of the printing device advancing means, is best shown in Figs. 54, 55 and 60, and is generally similar to the clutch 250 in its form, construction and operation. Thus as shown in Fig. 55, the bearing bracket 202 has a bearing sleeve 202' which is located between the clutch 250 and the clutch 251, and adjacent the right-hand end of the bearing sleeve 202' a driving member 255' is pinned to the shaft 200, and this member 255' constitutes the driving member of the clutch 251. At the right-hand end of the driving member

255', a hollow hub 257' is provided having a clutch dog 258' mounted thereon in the same manner as the clutch dog in the clutch 250. The clutch dog 258' is arranged to engage a recess or notch 260' formed in the driving member 255', and a projecting stop tooth 263' on the clutch dog 258' is adapted to be engaged by a stop lever 270' to terminate the rotation of the driven member 257' of the clutch 251 after the driven member has moved through but one revolution. In the present instance the driven member 257' of the clutch 251 is mounted on and carried by an eccentric 272 as by means of a pinned connection 273 shown in Fig. 55 of the drawings. With this construction the rotation of the driven member 257' serves to operate the eccentric 272, the resulting rotative movement of the eccentric 272 is utilized through the medium of a connecting rod 274 to operate the printing device advancing means, as will be hereinafter described in detail.

Somewhat to the right of the eccentric 272 in Fig. 55, the shaft 200 has a sleeve 255'' pinned thereon so as to constitute the driving member of the clutch 252, and a driven member 257'' is mounted on the shaft 200 so that its clutch dog 258'' which is constructed and arranged in the same manner as the clutch dog 258 of the clutch 250, may be operatively engaged with the driving member 255'' to produce a one-revolution operation of the driven member 257'' of the clutch 252. The clutch dog 258'' of the clutch 252 is controlled by a stop lever 270'' (Fig. 58) as will be hereinafter described in detail. The driven member 257'' of the clutch 252 is mounted on and carried by an eccentric 290, such mounting being accomplished by means of a pinned connection 293 in the same general manner as the driven member 257' is mounted on the eccentric 272. The eccentric 290 is utilized in the present instance through the medium of means including a connecting bearing 294 and an adjustable connecting rod 295 to operate the platen mechanism P through its operative printing cycle.

While the operative connection of the drive mechanism to the platen mechanism P is described in detail in my co-pending application Serial No. 361,530, filed October 17, 1940, it will be observed in Fig. 59 of the drawings that the forward end of the connecting rod 295 is pivotally connected to the end of an arm 295' which is fixed to the left-hand end of a shaft 296. The shaft 296 is mounted in a bearing sleeve 296' which extends through and is rigid with the lower arm 104'' of the printing frame 104 in the manner described in detail in my co-pending application Serial No. 350,678, filed August 3, 1940. At its right-hand end the shaft 296 has an arm 297 fixed thereto and rocking movement of the arm 297 is imparted to a vertically extending link 297' which is connected at its lower end to the arm 297. At its upper end the link 297' is connected to an arm 298 which is fixed to the right-hand end of a shaft 298' which is mounted in a bearing sleeve 298'' that extends through and is rigid with the upper arm 104' of the printing frame 104, as described in my co-pending application Serial No. 350,678. At its left-hand end the shaft 298' has an arm 299 fixed thereto and the arm 299 is operatively connected to the carriage C of the platen mechanism through the medium of a pair of arms 299'. The details of the drive connection are fully described in my aforesaid co-pending application Serial No. 361,530 and, therefore, reference may be had to said application for details of form and function. The arrangement, however, is such that each time the clutch 252 drives the eccentric 290 through a complete revolution, the carriage C of the platen mechanism is reciprocated through an operative printing stroke and is returned to the retracted or rearward position shown in Fig. 4 of the drawings, and in order that smooth operation of the eccentric 299 and the associated mechanism may be assured, a contractual spring 295s is connected between the arm 295' and an anchoring pin on the mounting bracket 203. Thus the spring 295s is tensioned during the forward or idle stroke of the platen mechanism and during the return or work-performing stroke of the platen mechanism the spring 295s serves to supply additional power for operating the platen mechanism.

Since the clutch 250 is in the present instance utilized merely to connect the shaft 200 to the source of power, the driving member 255 of the clutch 250 is provided with a plurality of circumferentially spaced notches 260 so that the time required for engagement of the clutch 250 after the release of the clutch dog 258 by its stop lever 270 is correspondingly reduced. In the present instance four such notches 260 are provided so that the clutch 250 becomes operatively engaged in every instance after a maximum rotation of approximately ninety degrees.

With relation to the clutches 251 and 252, however, it will be noted that but one notch is provided in the driving members, and bearing in mind that the driving members 255' and 255'' are both pinned to the shaft 200, it is to be noted that the notches in the driving members 255' and 255'' of the two clutches 251 and 252 bear a predetermined angular relationship to each other so that the printing device advancing means and the platen mechanism will, in their operative movements, invariably bear a predetermined relationship.

The printing device advancing means

As pointed out hereinbefore the magazine M is located rearwardly and a substantial distance to the right from the printing position V, and it is through the use of the printing device advancing means of the present invention that this advantageous relationship of the magazine M and the printing position may be attained. In accordance with the present invention the printing devices D are advanced forwardly from an initial position I in the magazine M along a first or initial path, as shown in Fig. 3 of the drawings, in a step-by-step manner such that each printing device comes to rest forwardly of the magazine M at a position II which, in the present instance, constitutes a sensing position whereat control means or indicating means such as one or more tabs 117 (Fig. 31) may be sensed in a manner which is more fully described in my co-pending application Serial No. 392,151, filed May 6, 1941. In the next cycle of operation of the printing device advancing means the printing device at the sensing station II is advanced in a forward direction to a transfer station II—T, and is almost immediately moved from the transfer station II—T in a left-hand direction, as viewed in Fig. 3, along an intermediate path to a first intermediate station III. In the next operation of the printing device advancing means the printing device at the station III is further advanced along the intermediate path to a second

intermediate station IV, at which station the printing device is located beneath a window W which is provided in the table top T, so that station IV in the present instance constitutes an inspection or visual selection station. In the next operation of the printing device advancing means the printing device at station IV is further advanced to the left in Fig. 3 to a second transfer station IV—T located directly rearwardly of the printing station V, and at the second transfer station IV—T the printing device comes to rest in position to be advanced forwardly along a final path to the printing station V. In the next operation of the printing device advancing means, the printing device at the transfer station IV—T is advanced to the printing station V; while in the following cycle of operation the printing device is advanced forwardly from the printing station along said final path to a collecting station VI where it is discharged downwardly into the collector or drawer K.

The means which provides the initial, intermediate and final paths, and the associated printing device advancing means will now be described in detail.

The initial path along which the printing devices D are advanced forwardly from the magazine M is provided by a pair of laterally spaced girders **300** and **301** which are arranged in a parallel horizontal relationship so as to extend in a direction from front to rear of the machine. At their rear ends both of the girders **300** and **301** rest upon and are secured as by means of bolts to the rear supporting bar **134**. The girder **300** is, in the present instance, the right-hand girder and this girder extends forwardly so that its forward end rests upon and is secured to the forward supporting bar **136** by means of a cap screw (not shown) which extends upwardly through the bar **136** and is threaded into the forward end of the girder **300**, while the other or left-hand girder **301** terminates at the intermediate guideway and is supported by a portion of the intermediate guideway, as will hereinafter be described.

The final path or guideway is provided by a pair of generally similar laterally spaced girders **330** and **331**, the girder **330** constituting the right-hand one of these girders and being arranged to extend from the rear supporting bar **134** to and beyond the forward supporting bar **136**. The forward end of the girder **331** is similarly supported on the forward supporting bar **136** so as to project forwardly of the bar **136** in a manner similar to the girder **330**, and the rear end of the girder **331** extends rearwardly beyond the transfer station IV—T. The rear end of the girder **330** is supported on and secured to the bracket **303** by means of a bolted connection indicated at **332** in Figs. 3, 50 and 51. The rear portion of the girder **331** is supported from the girder **330**, as will hereinafter be described.

The intermediate path or guideway is provided by a pair of girders **360** and **361** which are supported in parallel spaced relationship by suitable connection with the girders **300** and **330**.

As shown in Figs. 9 and 13, the rear ends of the girders **300** and **301** are preferably maintained in the desired spaced relation by an intermediate spacer bar **302** with reduced threaded ends **303'** passing through suitable holes in the girders and having nuts **303** on the ends **303'** to hold the two girders in the desired relationship to the spacer bar **302**. Headed screws **304** extend downwardly through the spacer bar **302** so as to securely hold the rear ends of the girders **300** and **301** in position on the rear supporting bar **134**. Forwardly of the bar **134** another spacing member **305** in the form of an inverted U-shaped metal member is also provided between the girders **300** and **301**, the spacing member **305** also functioning as a support for a part of the sensing means which are described in detail in my co-pending application Serial No. 392,151.

The desired support for the right-hand ends of the two girders **360** and **361** is provided by forming appropriate slots **306** and **307** through which the right-hand ends of the girders **360** and **361** extend as shown in Figs. 8A and 13. The girders **360** and **361** are held in this position by screws. With the right-hand end (Fig. 3) of the rear girder **361** thus supported, the forward end of the girder **301** is connected by means of screws (not shown) to the girder **361** so as to be supported thereby.

At their left-hand ends (Fig. 3) the two girders **360** and **361** are arranged to overlie a portion of a suitably slotted bearing plate **363**, which, as shown in Figs. 8A, 20, 25, 26 and 35, is secured to the side of the girder **330** as by welding, and the girders are suitably secured to the bearing plate **363** by screws **364**, as shown in Fig. 35 of the drawings.

The girder **331** is maintained in proper parallel and spaced relation to the girder **330** principally through the medium of a relatively rigid connection with an anvil A, as shown in Fig. 42 of the drawings, and by reason of the fixed mounting of the anvil, this connection holds the forward ends of the girders **330** and **331** in fixed relation upon the mounting bar **136**. Thus the girder **331** is disposed in abutment with one end of the anvil A and is secured rigidly thereto by means of screws **332'**. The other girder of the final path or guideway similarly abuts and is secured to the other end of the anvil A so that a relatively rigid relationship is established between the two girders **330** and **331**. This rigidity is enhanced through the provision of a spacer **333** which is of inverted U-shape form and is rigidly secured as by means of screws **334** between the two girders **330** and **331** somewhat rearwardly of the transfer station IV—T.

The interrelated network of girders as hereinbefore described functions as a part of the guiding means which defines the initial, intermediate and final paths for the printing devices D, and these girders also provide for the mounting and guiding of suitable printing device advancing means which operate to impart the desired step-by-step movement to the printing devices so as to advance the printing devices in sequence from the magazine M to the printing station and thence to the collector K. The printing device advancing means of the present invention is in most instances in the form of carrier means which engage the printing devices so as to carry the same from station to station along the several angularly related paths, and these carrier means are associated with retarding means which act during the return stroke of the advancing means to prevent retrograde movement of the printing devices.

The means for imparting the desired step-by-step movement to the printing devices from the magazine to the transfer station II—T is best shown in Figs. 3, 8, 8A and 9 to 13, inclusive, and since this means is closely associated with the supply magazine M, the construction and relationship of the magazine will first be described. As shown in Figs. 8, 9 and 13, the rear ends of

the girders 300 and 301 are provided with upstanding brackets 380 which are riveted to the girders and those brackets 380 provide for pivotal support of the magazine M to permit the magazine to be tipped rearwardly to an angular position during the loading operation. The magazine M comprises a pair of upright members 381 which have rearwardly projecting arms 382 at their lower ends which are pivoted at their rear ends by means of a pivot pin 384 to the upstanding brackets 380. In the present instance the two upstanding side members which form the magazine M are integrally cast and a plurality of suitable guide surfaces 385 are provided therein to engage the upper edges of the printing devices D when they are placed in their stacked relation in the magazine. Adjacent its lower end the magazine has a pair of spaced supporting arms 386 projecting forwardly therefrom so that the bottom one of the printing devices D in the magazine may rest upon the supporting arms 386 during the loading operation. When the printing devices D are placed in the magazine M the spacing flanges extend downwardly in the relationship shown in Fig. 30 of the drawings, and the arrangement is such that suitable advancing means which will hereinafter be described may engage these spacing flanges 118 on the lowermost one of the printing devices in the magazine M and move this printing device forwardly along the initial printing device path. Along the left-hand one of the upstanding members 381 of the magazine M a closure member 388 is supported for vertical sliding movement by means which is not shown in detail herein, and when the magazine is to be loaded, the closure member 388 is raised upwardly by means of a handle 389 and is then pivoted to the left, as viewed in Figs. 1 and 3, so as to expose the forward edges of the upwardly extending members 381 for the movement of the printing devices into the desired association with the magazine. A storage drawer containing the printing devices D which are to be loaded into the machine is then conditioned for loading by unlocking the conventional slide member 389' (Fig. 36) and sliding the member 389' as well as the printing devices D toward the rear of the drawer. The drawer is then placed with its lower end on an upstanding hollow guide member 390, Figs. 9 to 13, with the lower or rear end of the drawer resting on guide tracks 391 formed on the guide member 390, and between upstanding guide lugs 392. The upper end of the drawer is then moved rearwardly until the upper edges of the printing devices have been moved into operative relation to the guiding surfaces 385 of the magazine. The magazine and the drawer are then tipped rearwardly about the pivot 384 and against the restraining action of a spring tensioned retaining latch 484'' (Fig. 50) which normally holds the magazine in its upright position. The latch 484'' is tensioned by a spring 484' shown in Figs. 3 and 8. When the magazine and the drawer are thus tilted, the printing devices rest entirely upon the supporting arms 386 and the guiding surfaces 385. The bottom end of the drawer is then withdrawn in a forward direction away from the magazine M so as to leave the printing devices resting in a stack upon the arms 386 and the guide surfaces 385 of the magazine. The closure member 388 is then pivoted back to the right to the general position shown in Fig. 1 and is moved downwardly, through the medium of its sliding connection, to the exact position shown in Fig. 1 wherein it serves to maintain the printing devices D in the desired relationship to the guiding surfaces 385. The magazine M is then tipped forwardly and the printing devices are guided into proper position by the sloping side flanges 393 of a guide bracket which is secured to the rear face of the guide member 390, in the position to be advanced one by one along the initial path. The drawer from which the printing devices have been thus removed is then positioned in the front portion of the machine so as to form for the time being a part of the collector means K to receive the same printing devices which have been unloaded from the drawer into the magazine M.

In providing for the desired advancing movement of the printing devices D from the magazine M, a feed bar or carrier bar assembly 400 is provided, this carrier bar assembly 400 being best shown in Fig. 13 of the drawings. The carrier bar assembly 400 comprises a pair of carrier bars 401 and 402 which are similar in construction and which are adapted to ride in rabbeted grooves 403 which are provided in the adjacent upper edges of the girders 300 and 301. Adjacent their rear ends the carrier bars are interconnected by a pivot pin 404 which spaces the two carrier bars 401 and 402 and holds them in the desired relation to the sides of the rabbeted grooves 403, and centrally of the pivoted spacer bar 404 a connecting rod 405 is adjustably associated by means of a pair of nuts 406 and a threaded section 407 formed on one end of the connecting rod 405. At their forward ends the two carrier bars 401 and 402 are held in the desired spaced relationship by means of positioning and supporting rails 410 (Figs. 13 and 15) which engage the adjacent sides of the carrier bars 401 and 402. These positioning and supporting rails 410 are stationarily mounted at opposite ends of the spacer bar 305.

As will be seen in Fig. 13, the forward portion of the upper surface of each of the carrier bars 401 and 402 is formed at a slightly lower level than the rear portion 411 of the upper surface so as to provide a forwardly facing shoulder 412 on each of the carrier bars 401 and 402 substantially midway between the ends thereof. In this connection it will be observed that the arms 386 of the magazine are so positioned that when the magazine is in its normal upright relation the lower printing device D in the magazine has its spacing flanges 118 resting on the carrier bars 401 and 402. Thus, when the carrier bars 401 and 402 are in their advanced or forward positions as shown in Fig. 10 of the drawings, the surfaces 411 of the carrier bars are located beneath the lowermost printing device D contained in the magazine so as to support the same. As the carrier bars 401 and 402 move rearwardly to their normal rearward positions, as shown in Fig. 9 of the drawings, the surfaces 411 of the carrier bars are moved from beneath the lowermost printing device drops downwardly so that its spacing flanges 118 rest upon the lower upper surfaces 413 of the carrier bars 401 and 402 forwardly of the shoulders 412. In the next forward or advancing movement of the carrier bars 401 and 402, the shoulders 412 engage the rear ends of the spacing flanges 118 of the lowermost printing device D and move the same forwardly beneath retaining strips 414 which are secured by means of screws upon the upper edges of the

girders 300 and 301. The retaining strips 414 are positioned so as to overlie the carrier bars in upwardly spaced relation thereto, as will be evident from an examination of Fig. 15 of the drawings. As the forward movement of the printing device D progresses, and the printing device approaches station II, the central portion of the printing device, that is, the portion between the two spacing flanges 118, moves onto or over the upper surfaces of the supporting rails 410, as will be clear from Fig. 15 of the drawings. When the forward movement of the carrier bars 401 and 402 is terminated, the printing device D is located substantially at station II, which in the present machine constitutes the sensing station, and because it is desirable to have the printing device D accurately positioned or located during the sensing operation, the present machine provides means which cooperates with a notch 420 formed in one end of the printing device D to insure such accurate location of the printing device. By reason of the provision of such means for accurately positioning or locating the printing device at the sensing station, this means is also employed in the present instance to prevent retrograde movement of the printing device during the rearward or return stroke of the carrier bars 401 and 402.

In the present instance this means for accurately positioning each printing device D at sensing station comprises a positioning pawl 422 pivoted on the vertical axis at 423 on the upper surface of the girder 301 just to the right of the girder 300, as seen in Fig. 3 of the drawings. This pawl 422 has a pointed positioning tooth 424 formed thereon, as will be seen in Fig. 13 of the drawings, and the pawl is so actuated and controlled that the tooth 424 is withdrawn from the printing device guideway during the advancing movements of the printing device. The tooth 424 is formed adjacent the end of the pawl 422, and additional means in the form of a stop lug 425 is provided on the pawl 422 for the purpose of exerting a preliminary stopping or positioning action upon each printing device before the tooth 424 performs its final and accurate positioning operation. The tooth 424 and the stop lug 425 both project through suitable slots in the upper edge of the girder 300 so that they may be moved into the printing device guideway substantially in the plane of the main body of the printing devices in said guideway.

The positioning pawl 422 has a stud 426 projecting downwardly therefrom adjacent its end and a link 427 is connected to the lower end of the stud 426 for actuating the pawl about its pivot 423 in timed relation to the movement of the carrier bars 401 and 402. The cycle of movement of the pawl 422 is such that during the first portion of an advancing movement of the carrier bars 401 and 402, the tooth 424 and the stop lug 425 are both completely withdrawn from the printing device guideway and after the printing device from station II has been advanced beyond the stop lug 425, the stop lug is moved back into the printing device guideway so as to lie in the path of the next advancing printing device D. At this time, however, the tooth 424 is maintained out of the printing device guideway, and the stop lug 425 serves to prevent overshooting or overfeeding of the printing device D beyond station II. Thus the stop lug 425 serves in a preliminary way to position the printing device D in station II, this initial positioning being such that the notch 420 in the adjacent end of the frame of the printing device is substantially aligned with the end of the positioning tooth 424. The positioning tooth 424 is then advanced into engagement with the notch 420 to thereby accurately position the printing device at sensing station, and also to prevent retrograde movement of the printing device during the return stroke of the carrier bars 401 and 402.

When the carrier bars 401 and 402 are moved rearwardly after advancing a printing device into station II, the supporting surfaces 413 of the carrier bars are withdrawn from beneath the spacing flanges 118 of this printing device, and the printing device is thereafter supported at station II by the supporting rails 410.

When the carrier bars 401 and 402 have been fully retracted to their rearmost positions, as shown in Fig. 9 of the drawings, a pair of spring-pressed pawls 430 mounted at the upper forward corners of the carrier bars are located somewhat rearwardly of the ear ends of the spacing flanges 118 of the printing device which is then at sensing position, and in the next forward or advancing movement of the carrier bars the pawls 430 engage the rear ends of the spacing flanges of the printing device which is then located at the sensing station so as to impart forward movement to this printing device. It will be recalled in this connection that at this time the positioning pawl 422 is so actuated and positioned that the tooth 424 and the stop dog 425 thereof are withdrawn from the printing device guideway, and it will be clear, therefore, that the printing device will be advanced from the sensing station II toward the transfer station II—T.

The form, construction and mounting of the pawls 430 are shown in Fig. 21 of the drawings wherein it will be noted that the forward end of each carrier bar is recessed as at 432 and is provided on the rear wall of the recess 432 with an arcuate seat 433 in which the arcuate rear end of the pawl 430 is seated. Thus a pivotal mounting is provided for the rear end of the pawl 430 and beneath the pawl 430 and within the recess 432 a hairpin-type spring 434 is mounted so as to urge the forward end of the pawl 430 in an upward direction about the pivot provided by the arcuate seat 433. At its forward end the recess 432 is formed so as to provide a rearwardly extending stop tooth 435 which is engaged by a lug 436 formed on the pawl 430 to limit upward pivotal movement of the forward end thereof. The pawl 430 is retained in a lateral sense within the mounting thus provided by interlocking the spring 434 with the lower face of the pawl 430 and with the lower wall of the recess 432, as seen in Fig. 21 of the drawings. It will be observed that each pawl 430 has a forwardly extending finger 430' which provides for actual engagement of the pawl with the printing device, this finger 430' being so arranged that when the pawl is in its uppermost position, the finger is located immediately beneath the associated retaining plate 414. In the course of the rearward movement of the carrier bars 401 and 402 the two pawls 430 are cammed downwardly beneath the printing device then at sensing station through the medium of rearwardly sloping cam surfaces 430'' provided on the upper surfaces of the pawls. The cam surfaces 430'' engage the forward ends of the spacing flanges 118 of the printing device then at the sensing station so as to cam the pawls 430 downwardly, and as the carrier bars approach their

rearmost positions of Fig. 9, the pawls 430 move from beneath the printing device and return to their normal active positions so as to be conditioned for engagement with the rear edge of the printing device D which is then at the sensing station II.

As the forward movement of a printing device D progresses from the sensing station toward the transfer station II—T, the forward ends of the spacing flanges 118 of the printing device engage a pair of yielding pawls 440 which, as shown in Fig. 16 of the drawings, are mounted on opposite ends of a centrally supported spring bar 441. The spring bar 441 is mounted on the lower surface of the upper flange 361'' of the girder 361 between the two girders 300 and 301, and the upper flange 361'' of the girder 361 is appropriately cut away, as indicated at 444 in Fig. 14, to permit the spring 441 to normally force the yielding pawls 440 upwardly into the path of the spacing flanges 118. After the flanges 118 of the forwardly moving printing device D have engaged the adjacent sloping surfaces of the retaining pawls 440 so as to cam the retaining pawls 440 downwardly, the continued advancing movement of the printing device by the feed carrier bars 401 and 402 moves the printing device into intermediate path or guideway which is provided by the girders 360 and 361. This intermediate guideway and the printing device advancing means associated therewith will be described in detail after the drive connection for the carrier bars 401 and 402 has been more fully described.

As hereinabove pointed out, the clutch 251 is employed to control the operation of the printing device advancing means and when the clutch 251 is engaged, the eccentric 272 is rotated. In such rotation the eccentric 272 acts through the connector bar 274 to rock an arm 250 which is fixed at one end to a horizontal shaft 451. The arm 450 is pivotally connected as at 452 to the connecting rod 274 so that in the rotative movement of the eccentric 272 a rocking movement is imparted to the shaft 451.

The shaft 451 is mounted in a bearing tube 455 which extends transversely through and is carried by the lower arm 104'' of the printing frame 104. The construction of the mounting of the bearing tube 455 is explained in detail in my aforesaid co-pending application, Serial No. 350,678, filed August 3, 1940. The arm 450 is mounted on the left-hand end of the shaft 451, as viewed in Figs. 3 and 8, while a second arm 460 is mounted on and fixed to the other or right-hand end of the shaft 451 so as to be located beneath the initial printing device guideway which is formed by the girders 300 and 301. The arm 460 has two laterally spaced body portions connected by webs and at the upper end a pivot pin 461 extends between the two side portions of the arm 460 and through the rear end of the connecting rod 405 which, at its other end, is connected through the spacer bar 404 to the carrier bars 401 and 402. Thus in each rocking movement of the shaft 451, the carrier bars 401 and 402 are reciprocated through a predetermined stroke during which the feeding movement of the printing devices, as hereinbefore described, is accomplished. In order that wear in the bearings, and particularly in the eccentric 272 may not cause overshooting of the carrier bars 401 and 402 in a forward direction, an adjustable stop 463 is provided on a cross bar 464 between the two girders 300 and 301, as shown in Fig. 9. The stop 463 is adjusted so that when the forward limit of the carrier bars 401 and 402 is reached, a sloping forward end surface 465 on the connecting rod 405 strikes the stop 463 at an angle, as shown in Fig. 10. This angular engagement results in stopping the forward movement of the carrier bars 401 and 402 with a sufficiently impositive action to prevent damage to the machine, yet prevents overthrow of the parts which might damage the parts of the intermediate guideway.

The second or intermediate path of movement of the printing devices D extends from the transfer station II—T to the transfer station IV—T and this guideway is provided by means associated with the two girders 360 and 361. This intermediate guideway also has printing device advancing means associated therewith which operates in timed relation to the operation of the carrier bars 401 and 402, and it is also provided with a retaining means to prevent retrograde movement of the printing devices during the return or inactive stroke of the printing device advancing means. The intermediate printing device guideway is so arranged that the printing devices are positioned therein with their longitudinal axes located parallel to the longitudinal axis of the intermediate path.

The intermediate printing device guideway which is provided by the girders 360 and 361 is provided with a longitudinally reciprocable printing device advancing means in the form of an assembly 470 which imparts the desired advancing movement from the right to left to the printing devices in the intermediate guideway, and it is also provided with a restraining means in the form of a stationary assembly 471 shown in Figs. 24 and 35 which engages the right-hand end edges of the printing devices in the intermediate guideway to prevent retrograde movement during the return stroke of the advancing means 470. As hereinbefore pointed out, the girders 360 and 361 are generally Z-shaped in cross-section so that the lower edges of the girders 360 and 361 have projecting flanges 360' and 361', respectively, which extend toward each other and provide the necessary support for the reciprocable assembly 470. The Z-shaped cross-sectional form of the two girders 360 and 361 also provide outwardly extending upper flanges 360'' and 361'' on the upper edges of the girders 360 and 361, respectively.

The advancing means 470 as herein shown comprises a pair of similar carrier bars 481 or 482 which are held in the desired spaced relation to each other by a plurality of U-shaped connector members. In the present instance these connector members are designated as 483, 484 and 485, respectively, and are spaced longitudinally of the carrier bars 481 and 482 and have their upstanding side members secured to the carrier bars by means such as cap screws 486. The carrier bars 481 and 482 are adapted to ride upon guide surfaces provided by the two flanges 360' and 361', respectively, with the outer side surfaces of the two carrier bars 481 and 482 in sliding engagement with the webs of the two girders 360 and 361. When the carrier bars are thus mounted, the U-shaped connector members 483, 484 and 485 extend slightly below the lower surfaces of the lower flanges 360' and 361', as shown in Fig. 20 of the drawings, and for the purpose of holding the carrier bars 481 and 482 in position, two of the connector members as, for example, the connector members 483 and 485

are formed with apertures 487 at the lower corners thereof, as shown in Fig. 35, so that a retaining bar 488 may be positioned on the upper surface of the cross member of each connector member with its ends extending through the apertures 487 and into engagement with the lower surfaces of the flanges 360' and 361'. The retaining bars 488 are held in place by cap screws 489 which are screwed downwardly through the retaining bars 488 and into the cross members of the connecting members 483 and 485. Thus, the carrier bars 481 and 482 are mounted and guided along a predetermined path and are adapted for reciprocatory movement along this path by suitable actuating means which may include an actuating link 490, as shown in Fig. 35 of the drawings. This actuating link 490 is in the present instance operatively connected at one of its ends to the spacing member 484 by means of a suitable pivot pin.

As shown in Figs. 17 to 19, inclusive, 21 to 23, inclusive, 25, 26, 33 and 35, the carrier bars 481 and 482 are provided with a plurality of pairs of actuating pawls which are so spaced along the carrier bars that the three printing devices, which are at certain times in the operation of the machine located at stations II—T, III and IV, may be engaged and advanced each to the succeeding station. Thus, near the right-hand ends of the carrier bars 481 and 482 a pair of spring-pressed actuating pawls 495 are mounted; and spaced to the left from the pawls 495 in an amount substantially equal to the distance between stations II—T and III, another pair of actuating pawls 496 are mounted one on each of the carrier bars 481 and 482; and adjacent the left-hand ends of the carrier bars 481 and 482 another pair of pawls 497 are mounted one on each of the carrier bars. The form and mounting of the actuating pawls 497 is substantially the same as hereinbefore described in connection with the actuating pawls 430. The actuating pawls 495 and 496 are similar in construction and mounting and such construction is shown in Figs. 14 and 17. In each instance a recess 498 is provided in the carrier bar, there being an arcuate seat 499 formed at the rear or right-hand end of each such recess. The pawl is in each instance provided with a rounded end which cooperates with the seat 499 to provide a pivotal mounting, and a hairpin-type of spring 500 is provided in each recess beneath the pawl to urge the forward or left-hand end of the pawl into an upwardly projecting relation which is determined by a stop lug 501 which engages with a tooth 502 formed on the left-hand wall of the recess. Through interlocking of the spring 500 with the bottom of the pawl, the pawl is maintained in the desired lateral position with respect to the recess 498.

With the pawls constructed as thus described, it will be apparent that in an advancing or left-hand movement of the carrier bars 481 and 482, the actuating pawls 495 will be engaged with the righ-hand end edge of the printing device at the transfer station II—T, the actuating pawls 496 will be engaged with the right-hand end edge of the printing device located at station III and the ends of the pawls 497 will be engaged with the right-hand end edge of the printing device located at station IV, and as the left-hand or advancing movement of the carrier bars 481 and 482 progresses, each of these printing devices will be advanced to the next succeeding station.

During such movement the lower surfaces or edges of the spacing flanges 118 of the printing devices will be located directly over surfaces 505 and 506 formed on the upper faces of the upper flanges of the girders 360 and 361, respectively, as shown in Fig. 9, and in this connection it will be observed that the upper flange 360'' of the girder 360 is relatively thick in a vertical direction and has a rabbeted groove formed at its inner or right-hand corner, as seen in Fig. 9, to provide the surface 505. Along the upper surface of the flange 360'' a retaining strip 508 is secured by means of screws so that the printing devices in the intermediate guideway are held down and in engagement with the actuating pawls. On the other or rear side of the intermediate guideway, space must be afforded to provide clearance for the identifying means such as the tabs 117, and in this connection, it will be observed that the flange 361'' of the girder 360 is relatively thin in a vertical direction. With this thin flange 361'' a spacer bar 510 is associated as shown in Fig. 35, the spacer bar having its upper forward corner rabbeted as at 511 to provide a longitudinal shoulder 512 facing forwardly and located along the rear side of the intermediate guideway so that the shoulder 512 may be engaged by the rearwardly facing ends of the spacing flanges 118 to insure proper lateral positioning of the printing devices in the intermediate guideway. When the printing devices are thus positioned in the guideway, the identifying means such as the tabs 117 may project into the rabbeted groove 511 in the spacing bar 510, and a relatively wide retaining plate 514 is secured in place on the top of the spacing bar 510 so as to extend forwardly across and into an opposed relation to the surface 506. Thus, the rear edges of the printing devices are held down by the retaining strip 514 and are maintained in engagement with the actuating pawls such as the pawls 495. At station IV, which constitutes the visual selecting station of the present machine, the retaining strip 514 has an elongated slot 515 formed longitudinally thereof so as to overlie the rabbeted groove 511 and thus permit the operator to see any tabs which may be present upon the printing device which is located at station IV. In this connection it will be observed that the table top T is provided with a window W at the station IV so that the slot 515 may be viewed therethrough. In order that the positoning of any such tab may be readily identified by the operator, a plurality of index or position-indicating numbers are formed on the upper face of the retaining strip 514, as indicated at 516 in Fig. 8A of the drawings.

After the printing devices in the intermediate guideway have been advanced to any one of the stations by the carrier bars 481 and 482, these printing devices are held against retrograde movement during the return stroke of the carrier bars through the medium of means associated with the stationary assembly 471 shown in Fig. 35. This assembly 471 comprises a central mounting bar 520 which at its left-hand end is seated in a slot 521 formed in the upper surface of the mounting plate 363, this end of the mounting bar 520 being secured in place by means such as a screw 522 as shown in Fig. 33. At its right-hand end the mounting bar 520 is seated in a slot 523 formed in the girder 300 intermediate the two girders 360 and 361. At its right-hand end and in alignment with the initial printing device path, the mounting bar 520 has a supporting plate 525 secured thereto by a means such as a screw 526, and the right-hand end of the

mounting bar is secured in the slot 523 by means of screws 527 which extend downwardly through the supporting plate 525 and into the upper end of the girder 300. On one side of the mounting bar 520 a retaining pawl 530 is pivotally mounted in the position shown in Figs. 24 and 35, which position is such that when a printing device is moved into station III, a notch 531 formed in the upper left-hand corner of the retaining pawl 530, as viewed in Fig. 35, will be engaged with the right-hand or trailing spacing flange of this printing device so as to prevent retrograde or right-hand movement of the printing device. A similar retaining pawl 535 is similarly mounted on the mounting bar 520 in such position that it will accomplish the same function with respect to a printing device located at station IV. The construction and mounting of the retaining pawls 530 and 535 is best shown in Fig. 24 of the drawings wherein it will be evident that a mounting stud 536 is provided for each pawl and passes through the pawl intermediate its ends. The pawl is held on its mounting stud by means of a suitable U-clip 537 and adjacent the rear end, that is, the end which is remote from the notch 531 of the pawl, an anchoring stud 538 is provided. A coil spring 539 acts between the anchoring stud 538 and a similar anchoring stud 540 which projects from the mounting bar 520 to urge the pawl toward its upwardly projecting or active position.

At the left-hand end of the mounting bar 520 a pair of pawls 540 are pivotally mounted on opposite sides of the bar 520 by means of a mounting stud 541 which passes through the two pawls 540 and the mounting bar 520. At the right-hand ends of the pawls 540 suitable tensioning springs 542 are provided which are mounted and connected in the same general manner as the springs 539 of Fig. 24. The two retaining pawls 540 are disposed on opposite sides of the mounting bar 520 and diverge outwardly from each other so as to project in substantially spaced relation through slots 543 which are formed in the upper edge of the girder 330, as shown in Figs. 32 and 33. The ends 540' of the retaining portions 540, as shown in Fig. 33 of the drawings, are arranged so that when the pawls 540 are in their uppermost positions, they will prevent return movement of the printing device along the intermediate guideway. As a printing device passes along the intermediate guideway over the retaining pawls 540, it is being moved into the transfer station IV—T, and the primary function of the pawls 540 is to insure that the printing device at the station IV—T will remain in the proper alignment with the final guideway and thereby insure proper actuation of the printing device from station IV—T forwardly toward station V or printing station.

Returning now to the construction and arrangement of transfer station II—T, it will be observed that the two detent lugs 440 are located in such a position as to be engaged only by the spacing flanges 118 and between the two detent lugs 440 an intermediate plate 550 is secured as by means of screws upon the top of the flange 361'' so that its forward edge 512' is in alignment with the forward edges of the two lugs 440 and with the guiding shoulder edge 512. Thus, after a printing device has been moved forwardly past the lugs 440, these two lugs 440, the forward edge 512' of the plate 550 and the guiding edge 512 of the spacing member 510 will form a continuous guiding edge which may engage with the rear ends of the spacing flanges 118 to thereby guide the same in the movement of a printing device along the intermediate path by the carrier bars 481 and 482.

It will also be observed that the supporting plate 525 has an upstanding ledge 551 along its right-hand edge, as shown in Fig. 35, the upper surface of this ledge 551 being in the plane of the upper edge of the flange 360''. The ledge 551 and the portion of the flange 360'' which is aligned with the initial path or guideway are employed to mount a retaining plate 552 which overlies the transfer station II—T. This retaining plate 552 is formed and arranged so as to lie substantially in the plane of the retaining strips 414 of the initial path or guideway so that the carrier bars 401 and 402 may move a printing device into the transfer station II—T in such a relation that the printing device rests upon the supporting plate 525 and is held down by the retaining plate 552 in the event that an upward force is applied to the printing device.

The timing of the movements of the carrier bars 401 and 402 with respect to the movements of the carrier bars 481 and 482 is such that a printing device is moved into the transfer station II—T at a time when the pawls 495 are being moved across the transfer station to the right in Figs. 17 to 19 and 35. Provision is made, therefore, for retracting the pawl 495 which is adjacent the girder 361 during that portion of its movement wherein it might interfere with the advancing movement of a printing device into the transfer station II—T. To this end a transversely extending pin 560 is provided adjacent the end of the pawl 495 which is mounted on the carrier bar 482, and as shown in Figs. 17, 18 and 19, this pin 560 engages a guiding means during its return or right-hand movement which acts to retract the actuating pawl upon which the pin 560 is mounted. The timing of the two sets of carrier bars is such in the present instance that the pawl need not be retracted downwardly until it has passed across substantially one-half of the length of the transfer station II—T, and a spring type guiding member 561 is, therefore, provided which is turned upwardly at its left-hand end, as indicated at 562 in Fig. 17. Thus, when the carrier bar 482 moved to the right from the position of Fig. 17 to the position of Fig. 18, the pin 560 engages the sloping end 562 of the guide member 560 and rides downwardly along the lower surface of the guide member 561 so as to retract the pawl until such time as the pin 560 rides off the right-hand end 563 of the guide member 561. The pawl 495 upon which the pin 560 is mounted is at this time located to the right of the transfer station II—T and the associated spring may, therefore, force the pawl upwardly to its normal operative position. It will be observed from an examination of Fig. 18 that such retraction of the pawl 495 moves the pawl downwardly so that it does not stand in the path of the printing device which is being advanced forwardly from the station II into the transfer station II—T. After the pawl 495 has passed the right-hand end 563 of the guide member 561 and has moved upwardly beyond the end 563, the left-hand movement of the carrier bar 482 may be initiated and in such movement the pin 560 moves along the upper surface of the guide member 561. When the pin 560 reaches the left-hand end 562 of the guide member 561, this end is shifted downwardly due to the spring construction of the guide member

561 and in its further advancing movement to the left, the pawl 495 is maintained in its upper operative position so as to move the printing device to station III. This guiding means for the pawl 495 is mounted on the lower surface of the supporting member 525, as will be evident in Figs. 12 and 14 of the drawings.

The desired reciprocation of the carrier bars 481 and 482 in timed relation to the reciprocation of the carrier bars 401 and 402 is preferably attained through a driving connection which has its source at the clutch 251, and in the present instance the driving action is attained by interconnection with the actuating arm 460 through a suitable lever system so as to drive the carrier bars 481 and 482. This interconnection is such that the printing devices in the intermediate guideway are moved from station to station with a controlled acceleration and deceleration of each advancing stroke or movement, and from a practical standpoint such control of the acceleration and deceleration is important by reason of the fact that the printing plates 113 are held in place by spring detent devices 114 which, if the acceleration and deceleration were not controlled, might in some instances become disengaged due to the inertia of the printing plate 113. Thus the initial portion of an advancing movement of a printing device in the intermediate guideway is accomplished with a substantially uniform acceleration while the terminal portion of each such advancing movement takes place with a substantially uniform deceleration.

The actuating means for the carrier bars 381 and 382, as herein shown, comprises a lever 600 which is generally in the form of a bell crank and is mounted on a vertical bearing axis 601 carried on the left-hand end of a bracket 602 secured by bolts 603 to the forward supporting bar 134. The bell crank 600 has one arm 605 which is connected by means of a pivot pin 606 to the right-hand end of the link 490 so that as the bell crank 600 is rocked about its vertical pivot 601, the carrier bars 481 and 482 are reciprocated along the intermediate guideway. The bell crank 600 has another arm 608 which projects in the opposite direction from the pivot pin 601 and has one end of a link 609 connected to its end by means of a pivot pin 610. The other end of the link 609 is connected by means of a pivot pin 611 to a lever 612 which is mounted for rocking movement about a vertical axis provided by a pin 613 which is mounted in the bracket 602, as shown in Figs. 8A and 9. The lever 612 is formed by upper and lower plates 613' and 613'', and the link 609 is connected to and extends across the upper surface of the upper plate 613', as shown in Fig. 9. The two plates 613' and 613'' form, in effect, a bell crank lever, there being a second vertical pivot pin 615 mounted therein in an angularly spaced relationship to the pivot pin 611, and through the medium of the second pivot pin 615 the lever 612 is operatively connected to the arm 460 so that the lever 612 is rocked about its pivot 613 in timed relation with the rocking movement of the arm 460. This operative connection is provided by an adjustable connecting rod 620 which has a universal connection 621 at one of its ends with the pivot pin 615 and a universal connection 622 at the other of its ends with a pivot pin 623 which is parallel to the shaft 451 and is located on the arm 460 intermediate the ends thereof. The desired adjustment in the connecting rod 620 is in the present case provided at both ends thereof by means of a screw and nut or turnbuckle, as indicated at 624 in Fig. 9 of the drawings.

The operative connection between the arm 460 and the carrier bars 481 and 482 is such that when the carrier bars 401 and 402 are withdrawn to their rearward positions, as shown in Fig. 9, the several elements of the lever system assume the positions shown in Figs. 3, 8A and 9, and the carrier bars 381 and 382 of the intermediate guideway are at the end of their advancing strokes, or, in other words, at the left-hand end of their reciprocatory path. As the rock shaft 451 is actuated in a counterclockwise direction from the position of Fig. 9 to the position of Fig. 10, the carrier bars 401 and 402 are, of course, actuated so as to feed the printing devices in the initial guideway in a forward direction, and in the course of such feeding movement the member 612 is rocked in a counterclockwise direction, as viewed in Figs. 3 and 8A, so as to impart a related clockwise movement to the bell crank 600. Thus it will be clear that as the carrier bars 401 and 402 advance in a forward direction through their operative or advancing strokes, the carrier bars 481 and 482 are moved to the right through their preliminary or inactive strokes.

In the final printing device path or guideway provided by the two girders 330 and 331, a pair of carrier bars 651 and 652 are mounted for reciprocation in rabbeted grooves 653 formed along the adjacent upper corners of the girders 330 and 331. The two carrier bars 651 and 652 are held in spaced relation so as to ride in the two grooves 653 by means of a spacer bar 654 which is capable of rocking movement, and this spacer bar 654 is connected by an adjustable connecting rod 655 to the end of the arm 450 through the medium of a pivot pin 656. Thus, provision is made for reciprocation of the carrier bars 651 and 652 in timed relation to the reciprocatory movement of the carrier bars 401 and 402, and adjustment of the location of the reciprocating stroke of the carrier bars 651 and 652 is provided by an adjustable screw and nut connection 657 (Fig. 36) between the connecting rod 655 and the spacer bar 654.

Objectionable overfeeding movement of the carrier bars 481 and 482 in a forward direction is prevented by means such as a U-shaped stop bracket 658 which is bolted at 658' to the rear face of the anvil A. The arms 659 of the bracket 658 project rearwardly, as shown in Figs. 25 and 36, and have sloping rear end surfaces 659' which at the end of the forward movement of the carrier bars 481 and 482 are engaged by cylindrical end portions 654' of the cross bar 654, as will be evident in Fig. 25 of the drawings. Thus it will be clear that even though the eccentric 772 or other bearing surfaces may wear during the continued use of the machine, the forward stroke of the carrier bars 481 and 482 will invariably be terminated at the proper point.

The carrier bars 651 and 652 are provided with a pair of actuating pawls 660 which in form and function are substantially similar to the actuating pawls 495. The pair of actuating pawls 660 are so arranged that in a forward movement of the carrier bars 651 and 652 from their retracted position of Fig. 37 to their advanced position of Fig. 38, the printing device D at transfer station IV—T is advanced along the final guideway into printing position over the anvil A. At the forward ends of the carrier bars 651 and 652 a

pair of actuating pawls 661 are provided, these actuating pawls being constructed and mounted in the same general manner as the actuating pawls 430. During the advancing movement of the carrier bars 651 and 652 from the retracted position of Fig. 37 to the advanced position of Fig. 38, the actuating pawls 661 engage the printing device at printing position and move the same forwardly along the final guideway to station VI, at which station the printing device is allowed to drop downwardly so as to be discharged to the collector K in a manner which will be hereinafter described in detail.

The final guideway is so constructed and related to the intermediate guideway that when a printing device is fed past the detent pawls 540 of the intermediate guideway, the printing device is properly supported and positioned in the final guideway for engagement and actuation by the actuating pawls 660 of the carrier bars 651 and 652. The individual structural elements which are assembled in forming the final guideway for this purpose are shown in a separated relationship in Fig. 42 wherein it will be noted that a pair of supporting bars 670 is provided to extend longitudinally along the final guideway between the separating member 333 and the anvil A. Thus as shown in Figs. 36 to 38, inclusive, the supporting members 670 have their forward ends inserted in mounting slots 661 formed in the rear face of the anvil A, while the rear ends of the supporting bars 670 are secured as by means of screws 672 upon the upper surface of the separating member 333. The supporting bars 670 are spaced inwardly toward the center of the guideway so as to provide a substantial space between each supporting bar 670 and the adjacent one of the carrier bars 651 or 652, and these supporting bars 670 are utilized for the mounting of the several elements which make up the transfer station IV—T. Thus, it will be observed that the supporting bar 670 which is adjacent the girder 330 has a spring member 675 thereon having an upturned end 676 which functions with respect to the adjacent actuating pawl 660 in substantially the same manner as the guiding member 561 which is associated with the transfer station II—T. The functioning of the guiding member 675 will hereinafter be described in detail. On the other one of the supporting bars 670 a spacing strip 677 is provided so that an apertured supporting plate 678 may be secured in a horizontal relationship on the tops of the members 675 and 677. The plate 678 is utilized to receive and support each printing device as it is discharged from the intermediate guideway into the transfer station IV—T, and in order that each printing device may be guided during such movement, a guide strip 679 is provided on the upper rear face of the plate 678 which corresponds substantially in form and function with the strip 510. Thus the guide strip 679 has a groove 680 in its upper forward corner which corresponds to the groove 511 in the strip 510, and the forward edge 681 of the guide strip 679 constitutes a forwardly facing shoulder which is adapted to engage and guide the rearwardly facing ends of the spacing flanges 118 of the printing device as such a printing device is being advanced into the transfer station IV—T. On top of the guide strip 679 a retaining plate 682 is positioned by means of screws 683 which extend downwardly through the plates 678, 679, the spacer members and into the supporting bars 670. It will be observed in Figs. 25 and 42 that the retaining plate 682 is of a width somewhat greater than the adjacent retaining strip 514 so as to overlie a substantial area of the rear portion of the upper face of a printing device located at station IV—T. The other or forward edge of such a printing device is at this time positioned under the retaining strip 508 which, as shown in Figs. 25 and 42, extends entirely across the final guideway and is secured at its left-hand end to the girder 331 by means such as a screw 685. It will be observed in Fig. 27 of the drawings that the top of the girder 330 intermediate the two girders 360 and 361 of the intermediate guideway is substantially aligned with the top of the carrier bar 651 so that the printing devices may advance from the intermediate guideway across the top of the girder 330 and onto the supporting plate 678, it being noted that the plate 678 also has its upper surface substantially aligned with the top of the carrier bar 651 as well as with the top of the carrier bar 652. When the printing device D has advanced completely into the transfer station IV—T, as shown in Figs. 26 and 27, the spacing flanges 118 of the printing device rest upon the carrier bars 651 and 652, and it will be observed that the top of the girder 331 is somewhat higher than the top of the carrier bar 652 so that a retaining strip 683 may be secured on the top of the girder 331 to overlie the adjacent upper edge surface of the device while it is in the final guideway. A similar retaining strip 684 is secured along the top of the other girder 330 forwardly of the retaining strip 508 as will be evident from a consideration of Fig. 3 of the drawings.

At the time when a printing device is engaged by the pawls 497 and is being advanced into the transfer station IV—T, the carrier bars 651 and 652 are being moved through their return or rearward stroke and the timing of the parts is such that the pawl 660 which is adjacent to the girder 330 would in such an instance lie in the path of the advancing printing device. The pawl 660 which is mounted on the carrier bar 651 is therefore provided with a projecting pin 686 which in the return or rearward movement of the carrier bar 651 moves into engagement with the upturned forward end 676 of the guide member 675, and the pawl 660 is thereby pivoted downwardly into an out-of-the-way relationship while it passes rearwardly beneath the transfer station IV—T. When the carrier bar 651 has substantially reached the rearward extent of its travel, the pin 686 rides off of the guide member 675 so as to assume its active position shown in Fig. 41 of the drawings. It will be evident, therefore, that in the forward movement of the carrier bar 651 the pin 686 will pass along the upper surface of the guide member 675 so that the associated pawl 660 may engage the rear edge of the printing device at the transfer station IV—T to thereby advance this printing device forwardly along the final guideway and to printing position.

Means is provided at printing position to accurately position or locate the printing device during the printing operation, and this means in the present instance is utilized to restrain the printing device against retrograde movement during the return stroke of the carrier bars 651 and 652, and is also arranged to function in preventing overshooting or overfeeding of the printing device beyond the printing position. Thus, as shown in Figs. 3, 25 and 42 to 46, inclusive, a

positioning pawl 690 is pivoted at 691 on a vertical pivot pin provided on the girder 330 just rearwardly of the printing position, and this positioning pawl 690 is in the form of a bell crank having a first arm 692 projecting forwardly along the outer side of the girder 330 to a point beyond printing position. At its end the arm 692 has a stop finger 693 which may project through a suitable notch in the girder 330 into the path of an advancing printing device so as to limit such advancing movement. On the arm 692 rearwardly of the stop finger 693 a positioning tooth 694 is formed which may project through a suitable notch in the upper edge of the girder 330 and into the V-shaped positioning notch 420 of a printing device located at printing position. The pawl 692 has another arm 695 which projects substantially at right angles to the arm 692 and away from the final guideway and by actuation of the arm 695 the pawl 690 is moved through an operative cycle in timed relation to the printing device advancing means so that when a printing device is to be advanced from printing position forwardly to the discharge station or station VI, the tooth 694 and the stop finger 693 are completely withdrawn from the printing device guideway so that the actuating pawl 661 may engage the rear edge of the printing device at printing position to advance this printing device to the collecting station or station VI.

After the printing device has been moved beyond the stop finger 693, the pawl 690 is actuated so as to move the stop finger 693 a short distance into the printing device guideway, the location of the pawl 690 at this time being such that the positioning tooth 694 is outside of the printing device guideway. The actuating pawls 660, in their continued forward movement, advance the next printing device toward printing position in such a manner that the printing device may in some instances move into engagement with the stop finger 693, and in such instances the stop finger acts to initially locate or position the printing device. The positioning pawl 690 is then actuated in a clockwise direction in Fig. 25, so that the positioning tooth 694 enters the positioning notch 420 in the printing device, thereby to accurately locate the printing device in position at the printing station. This engagement of the positioning tooth 694 with the printing device is maintained during the rearward stroke of the feed bars 651 and 652, and as a result the printing device is held in position against retrograde movement while the sloping upper surfaces of the pawls 661 engage the forward ends of the spacing flanges 118 to be thereby cammed downwardly while the actuating pawls move rearwardly beneath the printing device.

When a printing device D is advanced forwardly from the transfer station IV—T toward the printing position, it moves with its two end edges beneath the two retaining strips 683 and 684, and the printing device moves beneath a ribbon guard 700 which is secured on the top of the retaining strips 683 and 684 so as to span the final printing device guideway just rearwardly of the printing position. At its forward end the ribbon guard 700 has two fingers 701 which project forwardly over the end portions of the printing device at printing position, and the inked ribbon IR is arranged to extend over these two fingers 701 and across printing position, as indicated in Figs. 8A and 42. It will be observed, of course, that the ribbon guard 700 is positioned directly beneath the opening 166 in the shield 165 of the table top T, so that when a sheet is positioned over the opening 166, the platen mechanism P may press the sheet downwardly into operative or printing relationship to the inked ribbon IR and the printing device which is located in printing position on the anvil A.

When a printing device at printing position is engaged and moved forwardly along the final guideway by the pawls 661 this printing device is moved into a downwardly extending curved guideway 720 which directs the printing device downwardly and in generally vertical position into the drawer or collector K. In providing this guideway, each of the girders 330 and 331 has a vertically extending mounting plate 721 fixed thereto as by welding and along an outer portion of each such mounting plate a guide plate 722 is fixed so as to define the outer edge of the vertical guideway 720 by being in position to engage the outwardly or forwardly facing surface of the adjacent end of the printing device. The inner side of the guideway is defined by a pair of guide plates 723 which slope downwardly in spaced relation to the rear edge of the guide plates 722. The guide plates 723 are spaced away from the mounting plates 721, as shown in Fig. 43 of the drawings, and are secured in position by a U-shaped mounting bracket 724 which is fixed by means of cap screws 725 to the forward edge of the anvil A. In the present instance the guide plates 723 are spot welded to the projecting arms of the U-shaped bracket 724 as indicated in Fig. 36 of the drawings. In its downward movement along the discharge guideway 720 a printing device comes to rest in a substantially vertical position on a pair of rearwardly projecting lugs 726 formed on the lower end of a packer frame 727 which is pivoted at its upper end on a pivot pin 728 extending between the two mounting plates 721. In the course of operation of the machine the packer frame 727 is rocked about its pivot 728 in such a manner that when a printing device drops down along the guideway 720, the lugs 726 are located somewhat rearwardly from the position shown in Fig. 36 so that the lower edge of the printing device comes to rest on the lugs 726. Thereafter in the course of an operating cycle, the packer frame 727 is withdrawn substantially to the position shown in Fig. 36, after which the lower end of the packer frame is moved to the right from the position shown in Fig. 36 so as to force the printing device to the right and past a pair of spring detents 729 which are in positions to engage the upper corners of the printing devices in the drawer or collector. At the conclusion of this packing movement, the lugs 726 are in position to have the succeeding printing device drop down the guideway 720 and come to rest thereon.

The packer frame 727 is in the present instance actuated by a lever 730 which is pivoted on the pin 728 on the left-hand side of the left-hand mounting plate 721, as shown in Fig. 4 of the drawings. A suitable actuating connection is formed between the lever 730 and the packer frames 727, this connection in the present instance being provided by a spring plunger 731 which enables the packer frame to be released from the actuating arms 730 when an operator desires to swing the packer frame forwardly to an out-of-the-way position in order to obtain access to the mechanism behind the packer frame.

During the packing operation as hereinbefore described, the sliding bracket member 389' of the drawer is forced rearwardly along its guideway

in the bottom of the drawer, it being observed that the conventional locking device 732 of the sliding bracket member is at this time in its released position.

The drawer K is in the present instance removably mounted on a drawer holder or supporting carrier 750 which is pivoted intermediate its ends at 751 on a bracket 752 which is supported at the upper edge of the skirt 136. The bracket 752 has an arm 753 projecting forwardly therefrom and the carrier 750 is normally held with its forward end tilted upwardly and in operative association with the packing means by means of a latch member 754 which normally rests on the top of a stud 755 carried on the arm 753 of the bracket 752. The latch 754 is pivoted at 756 on the lower face of the carrier 750 and may be disengaged from the stud 755 through actuation of a release plunger 760 which is mounted longitudinally of and beneath the carrier 750. The plunger 760 has its operating head located adjacent the forward end of the carrier 750 so as to be readily engaged by an operator when the carrier is to be tilted downwardly for the mounting or removal of a drawer thereon. The operative connection between the plunger 760 and the latch member 754 is provided by a link 761 having one of its ends connected to the latch member 754 and the other of its ends pivoted to the plunger 760.

When the carrier 750 is to have its forward end pivoted downwardly, the plunger 760 is actuated rearwardly so that the lower end of the latch member 754 is disengaged from the stud 755. The forward end of the carrier is then lowered about the pivot 751, and engagement of the forward side of the latch member 754 with the rear side of the stud 755 serves to hold the plunger 760 in its rearward position while the carrier 750 is in its lowered position. In the course of the rearward pivotal movement of the latch 754, a link 762 connected between the latch member 754 and a pivot 763 operates upon a pair of guide members 765 to withdraw these guide members downwardly and out of the forward portion of the drawer K. These guide members 765 normally project upwardly through openings in the bottom of the drawer K so as to cooperate with the packer mechanism in assuring proper positioning of the devices D in the drawer. The members 765 are, in the present instance, mounted on a lever 766 which is pivoted at 767 rearwardly of the members 765. The lever 766 projects rearwardly of the pivot 767 and has a spring 768 acting thereon to normally urge the lever in a clockwise direction about its pivot 767, thereby normally to project the guide members 765 upwardly into the drawer. In the course of the rearward releasing movement of the plunger 760 and the latch 754, the lever 766 is pivoted about its pivot 767 by reason of the action of the link 762 and the forward end of the lever 766 is thereby pivoted downwardly so as to withdraw the guiding members 765 downwardly out of the drawer K, and the removal of the drawer K from the carrier 750 is thereby facilitated.

When the printing devices from a particular drawer have been loaded into the magazine M in the manner hereinbefore described, the slidable supporting bracket 389' of the drawer is shifted forwardly to the forward portion of the drawer, and while the carrier 750 has its forward end tilted downwardly as indicated in Fig. 49 of the drawings, the empty drawer is placed in operative position on the carrier 750 and the carrier is again tilted to its normal or operative position of Figs. 36 and 48.

The packer frame 727 of the packing mechanism is rocked through an operative movement each time the shaft 200 rotates through its 360 degree operating cycle, and such rocking movement is attained through the medium of a link 770 which is connected at its forward end to the lower end of the packing lever 730. The connecting rod 770 extends in a generally horizontal direction rearwardly toward the shaft 200 and is connected at its rear end to a bearing 771 which surrounds an eccentric 772. The eccentric 772 is pinned to the shaft 200 between the bearing bracket 202 and the clutch 250 so that the eccentric 772 is rotated each time the clutch 250 is engaged.

The eccentric 772 also serves as a driving means for an eccentric 775 which is located on the left-hand side of the eccentric 772, as shown in Fig. 56, and is connected to the eccentric 772 by a pin 776 so as to be rotated with the eccentric 772.

It will be observed in Fig. 56 that the eccentric 775 is displaced angularly with relation to the eccentric 772 and the eccentric 775 is utilized to impart the desired step-by-step movement to the inked ribbon IR. For this purpose the eccentric 775 has a bearing 777 in surrounding relation thereto and this bearing has a connecting rod 778 secured thereto and extending forwardly as seen in Fig. 57 for connection to the inked ribbon advancing means shown in Figs. 3, 5, 6 and 8A.

The ribbon feed mechanism as shown in Fig. 3 comprises a pair of ribbon spools 780 and 781 mounted in suitable brackets 782 and 783 on opposite sides of printing position and having the inked ribbon extending therebetween and past printing position in the manner hereinbefore described. The particular construction and operation of the ribbon advancing means forms no part of the present invention but it may be here stated that the step-by-step advancing movement and the automatic reversing operation thereof are attained through means which includes a reciprocatory slide 784 shown in Fig. 5. This slide is reciprocated by means of a bell crank 785 having one of its arms connected to the slide 784 and the other of its arms connected as at 786 to the forward end of the link 778.

As hereinbefore pointed out, the positioning pawls 422 and 690 are actuated in timed relation to the movement of the various printing device advancing means so as to cooperate therewith in permitting the advancing movement of the printing devices, in preventing overfeeding of the printing devices past the sensing station and the printing station, in properly and accurately positioning the printing devices at these two stations, and in preventing retrograde movement of the printing devices in certain portions of the cycle of operation of the printing device feeding means. Such actuation of the positioning pawls 422 and 690 is attained through operative association of these pawls with the clutch 251 in such a manner that the positioning pawls are operated through the desired cycle of movement each time the clutch 251 is operated through its single revolution cycle. Thus, as shown in Figs. 54 and 55, a cam assembly 800 is mounted on the shaft 200 between the eccentric 272 and the driven member of the clutch 252. This cam assembly includes a central hub 801 having a plurality of discs secured thereto as by means of a pin 802.

The left-hand one of the discs 803 is secured by means of the pin 273 so as to rotate with the eccentric 272. The right-hand one 804 of the discs constitutes an actuating disc cam which in its rotary movement acts upon a roller 805 which is carried on an actuating link 806 adjacent one of its ends. The other end of the actuating link 806 is connected by a pivot pin 807 between downwardly extending bifurcations formed on a connecting block 808 which is pivoted by means of a vertical pin 809 on the lower face of an arm 810 of a bell crank 811. This bell crank as illustrated in Figs. 58 and 59 is mounted on a vertical pivot pin 812 on the lower surface of the girder 330. The bell crank 811 has a second arm 813 extending in a generally forward direction and at right angles to the arm 810 and connected by means of a pin and slot connection 814 to the left-hand end of the link 427 which, as hereinbefore described, is connected at its right-hand end to the positioning pawl 422. The link 427 is supported at its left-hand end by its connection with the bell crank 811 while with its right-hand end the link 427 is supported by its connection with the stud 426 and is guided by a stud 815 which extends through a longitudinal slot 816 formed in the link 427, the stud 815 being threaded into the lower surface of the girder 300.

The bell crank 811 has another or third arm 818 which extends substantially parallel to the arm 810 in the opposite direction from the pivot 812, and the arm 818 is secured by means of a pivot 819 to a link 820 which extends forwardly, as shown in Figs. 3, 25 and 43 to 46, and is connected at its forward end to the end of the arm 695 of the positioning pawl 690.

As shown in Fig. 58 of the drawings, the rear end of the actuating link 806 has a yoke-like formation rearwardly of the roller 805, this yoke-like formation providing two arms 822 having a pair of parallel opposed surfaces 823 which in the longitudinal actuation of the link 806 ride along opposite surfaces of a guiding groove 824 (Fig. 55) so as to guide the link 806 in one direction. The desired lateral guiding or positioning of the link 806 is attained by means of a flange 825 formed on the hub 801 to the right of the link 806 so that the cam disc 804 and the flange 805 engage opposite side surfaces of the arms 822 of the link 806.

The roller 805 is maintained in engagement with the cam surface of the cam disc 804 by means of a spring 830 shown in Figs. 3 and 59A, which acts between the link 427 and the arm 818 so as to urge the arm 818 forwardly. This action of the spring 830 urges the arm 810 and the link 806 in a rearward direction so as to maintain the roller 805 against the roller 804. A spring 831 is connected between the link 820 and the link 427 so as to act parallel to the longitudinal axis of the link 427 and urge the same yieldingly in a left-hand direction in Fig. 3. It will be clear, therefore, that by reason of the pin and slot connection 814 which are employed at the left-hand end of the link 427, the spring 831 may act with a yielding force, when the bell crank 811 is properly positioned, to urge the positioning tooth 424 of the positioning pawl 422 into operative engagement with the notch 420 of the printing device located at sensing station. The spring 830 functions with a similar action in maintaining the positioning tooth of the pawl 690 in engagement with the notch of a printing device located at printing position. It will be evident, of course, that with the present machine the presence of the notch 420 in each printing device D is not absolutely essential, even though it is desirable, for if such a notch is not present, the positioning tooth will merely be pressed against the straight end edge of the printing device with a yielding force. This action will prevent retrograde movement of the printing device, and yet the impositive actuation of the positioning pawl will prevent injury to the parts of the machine.

As shown in Fig. 58 of the drawings, the cam disc 804 is in its at rest position which it assumes when the clutch 251 is disengaged and the cam disc 804 is provided with a relatively abrupt leading surface 835 which engages the roller 805 soon after the clockwise rotation of the cam disc 804 is initiated. The leading surface 835 of the cam disc 804 merges with a concentric or dwell surface 836 which maintains the two positioning pawls in their retracted positions until the printing devices have been discharged forwardly past the sensing station and the printing station, and at this point in the operative cycle the pawls are allowed by reason of a receding surface 837 on the cam 804 to move inwardly into the printing device guideways to such an extent that the stop fingers are operative to prevent overfeeding of the printing devices. The positioning pawls are maintained in this relationship for a short time and then by reason of a second receding surface 838 on the cam 804, the pawls are allowed to move further in an inward direction with relation to the printing device guideways, thereby to enable the two positioning teeth to be urged yieldingly into the notches in the ends of the printing devices, such yielding actuation of the pawls during this portion of the operation of the machine is attained by reason of the action of the springs 830 and 831 as hereinbefore described.

The control mechanism generally

In the operation of the present machine, the normal printing operation constitutes what is usually known as "consecutive" printing wherein one printing impression is made from each of the printing devices fed through the machine. Thus, in the normal or consecutive operation of the machine, the printing device feeding means and the platen mechanism are each operated through their normal cycle so that a printing device advancing movement takes place and a printing operation is performed. In the present instance the printing device advancing movement takes place in the initial and final printing device guideways during the first half of the machine cycle, during which time the platen mechanism is operated through its forward or conditioning stroke. Thus the printing device which during the inactive period between periods of operation of the machine has been at rest at the transfer station IV—T is during the first half of the operative cycle of the machine advanced forwardly into printing position or station V, and concurrently with such advancing movement of the new printing device, the old or previously used printing device is discharged forwardly from printing position to the collecting station or station VI so as to be refiled in the drawer from which it was originally removed.

In other instances, the present machine may be operated through what is termed "repeat" operation and in such instances the same printing device is maintained at the printing station so that a plurality of printing impressions are

made from the same printing device. In such repeat operation of the machine, the printing device advancing means remains inactive and the platen mechanism is operated through the number of cycles required to perform the desired number of printing operations.

In other instances it is desirable to operate the present machine through what are termed "skip" cycles, in the course of which the platen mechanism P is maintained in an inactive relation so as to avoid printing from the printing device at printing station, and in such skip operation of the machine the printing device advancing means is operated through the number of cycles required to pass or skip the printing plates from which printing impressions are not desired.

When the machine is being operated in what is termed the normal or "consecutive" manner, the foot pedal 122 is employed to initiate each cycle of operation and in such actuation of the foot pedal 122, the master clutch 250, the clutch 251 of the printing device advancing means, and the clutch 252 which controls the operation of the platen mechanism P are all released so as to move through their one revolution cycles. When the machine is to be employed for "repeat" operation, the foot pedal 121 is employed and is actuated each time a repeat printing operation is to be performed. In such actuation of the foot pedal 121 the master clutch 250 and the clutch 252 which controls the platen mechanism are both released for operation through their one revolution cycles. When the machine is to be employed for "skip" operation, the foot pedal 120 is depressed each time a printing device is to be skipped. In such operation of the foot pedal 120 the master clutch 250 and the clutch 251 which controls the printing device advancing means are both released for operation through their one revolution cycles.

As herein shown, the pedals 120, 121 and 122 are similarly mounted in the supporting members 148 which extend downwardly from the skirt 138. Each supporting member 148 is in the form of a sheet metal channel having rearwardly projecting spaced flanges 148'; and each foot pedal is mounted at the forward end of a supporting lever 840 which is pivoted at 841 on a pivot pin which extends across the space between the two flanges 148' of its supporting member 148. Each lever 840 has a vertical rod or link 842 pivoted thereto at 842' forwardly of the pivot 841, and the link extends upwardly through a suitable aperture in the inturned between flanges 843 formed on the skirt 138. It will be observed that the inturned flange 843 extends rearwardly through a suitable aperture formed in the web of the supporting member 148 as shown in Fig. 49 of the drawings. Above the flange 843 an expansive coil spring 844 acts between the flange 843 and a washer 845 secured near the upper end of the link 842 to urge the link and the connecting pedal supporting lever 840 in an upward direction. Such upward movement of the lever 840 is limited by engagement of the upper surface of the lever 840 with the top of a notch 846 through which the lever 840 extends in a forward direction.

As shown in Fig. 50 of the drawings, the lever 840 upon which the foot pedal 120 is mounted has a link 850 connected thereto and extending upwardly, this link 850 being connected by a pin and slot connection such as that indicated at 852 in Fig. 49, to a rearwardly projecting lever 854. The lever 854 is freely pivoted at its forward end on a rock shaft 855 which is mounted in the upper ends of the flanges of the several supporting members 148 so as to extend entirely through the several mounting members. At its rear end the lever 854 has a vetrical connecting link or rod 856 connected thereto, the rod 856 extending upwardly and being operatively connected to the stop lever 270' of the clutch 251, this clutch being the one which controls the operation of the printing device advancing means as will be hereinafter more fully described.

The lever 840 upon which the foot pedal 121 is mounted has a link 860 connected thereto at the pivot point 842', and this link 860 has a pin and slot connection at its upper end with a rearwardly projecting lever 864 which is mounted on the shaft 855 so as to project rearwardly therefrom in the same manner as the lever 854. At its rear end the lever 864 has an upwardly projecting rod 866 pivotally connected therethrough, the rod 866 being operatively connected at its upper end to the stop lever 270'' of the clutch 252 which controls the operation of the platen mechanism P.

Thus it will be evident that when the clutch pedal 120 is depressed, the printing device advancing means will be set into operation, while if the foot pedal 121 is actuated, the platen mechanism P will be set into operation, and means is provided in association with the right-hand pedal 122 whereby, upon depression of the pedal 122, both of the levers 854 and 864 will be actuated or rocked so as to set the printing device advancing means and the platen mechanism into simultaneous operation. This end is attained through the medium of a link 870 which is pivoted at its lower end at the pivot point 842' of the lever 840 which supports the pedal 122, and the upper end of the link 870 is pivoted to the outer end of a short lever 871 which is fixed to and projects rearwardly from the rock shaft 855. Thus the rock shaft 855 will be rocked in a clockwise direction as will be viewed in Fig. 50 each time the pedal 122 is depressed, and such rocking movement of the shaft 855 is transmitted to the two levers 854 and 864 by means of a pair of lever arms 872 and 873 which are fixed upon the rock shaft 855. The lever arm 872 is arranged adjacent to the lever 864 and has a laterally projecting lug 874 at its end which overlies the lever 864. The lever arm 873 is arranged adjacent to the lever 854 and has a similar lug 875 which overlies the lever 854. Thus when the right-hand pedal 122 is depressed, the two lever arms 872 and 873 act through their associated lugs 874 and 875 to impart simultaneous downward rocking movement to the levers 854 and 864.

As shown in Figs. 51, 52, 53 and 54, the stop levers 270' and 270'' of the two clutches 251 and 252 are mounted on a supporting rock shaft 880 which is journaled in upstanding portions of the bracket 202. To the right of the bracket 202, as viewed in Fig. 54, an additional supporting bracket 881 is provided to impart additional support to the shaft 880. The two stop levers 270' and 270'' of the clutches 251 and 252, respectively, are mounted on the shaft 880 intermediate the ends of these levers and the rear ends of the levers 270' and 270'' extend rearwardly beyond the supporting bar 134 for appropriate connection with the rods 866 and 856, respectively. As shown in Fig. 50, each of the stop levers 270' and 270'' has a connecting block 882

connected thereto so as to project laterally from the end of the lever upon which it is mounted. Thus, as to the lever 270'', the connecting block 882 has a vertical bore therethrough and the threaded upper end of the rod 856 extends therethrough and is adjustably fixed in the desired longitudinal relationship by means of a pair of lock nuts 883 located at the upper and lower edges of the block 882.

The stop lever 270 for the master clutch 250 is fixed to the left-hand end of the shaft 880 as viewed in Fig. 54 and is urged toward its active relation to the clutch 250 by a spring 880'; and means is provided whereby the stop lever 270 of the master clutch is released each time either one of the stop levers 270' or 270'' is actuated. To this end the shaft 880 has a pair of lever arms 886 and 887 fixed thereto and projecting rearwardly therefrom. The lever arm 886 is arranged relatively close to the stop arm 270' of the clutch 251 and has a laterally projecting ear 888 formed thereon which underlies an adjustable vertically extending screw 889 which projects downwardly from a laterally projecting ear 890 formed on the stop lever 270' of the clutch 251. The lever arm 887 has a similar ear 891 projecting laterally therefrom so as to underlie an adjustable screw 892 carried on a laterally projecting ear formed on the stop lever 270'' of the clutch 252.

Thus, with the construction just described, actuation of either of the stop levers 270' or 270'' actuates either one or the other of the lever arms 886 or 887 so as to rock the shaft 880 and release the stop lever 270, and hence the stop lever 270 of the master clutch 250 is released each time either one of the clutches 251 or 252 is released; and since the driving members of the clutches 251 and 252 are normally stationary until the master clutch 250 has become engaged, provision is made for retaining or latching the stop levers 270' and 270'' of the clutches 251 and 252 in their released positions until such time as engagement of the master clutch 250 initiates rotation of the driving members of the clutches 251 and 252. This end is attained in the present instance through the provision of a pair of latch members 900 and 901, each of which is fixed on a latch shaft 902 which is mounted in the bearings 202 and 881, as will be evident from a consideration of Fig. 51 of the drawings. The latch members 900 and 901 are arranged to be engaged with suitable notches 903 and 904 formed respectively on the stop levers 270'' and 270' of the clutches 252 and 251, as seen in Figs. 51 and 58. Hence when one of the stop levers 270' or 270'' is rocked to its released position, the latch member 900 or 901 which is associated therewith is cammed upwardly by virtue of a cam surface 903' formed above the associated notch such as the notch 903 of Fig. 58, and the actuated latch member then moves downwardly into an engaging relation with the associated notch on the actuated stop lever. The latch shaft 902 is urged in a clockwise direction or in such direction as to tend to engage the latches by means of a spring 906 connected between a release lever 907 fixed on the end of the latch shaft 902 and an anchoring pin 907' mounted on a stationary portion of the frame. Thus when the stop lever 270'' is rocked by actuation of its control rod 856, the arm 887 on the shaft 880 is rocked so as to effect simultaneous release movement of the stop arm 270 of the master clutch. In the course of the rocking movement of the stop lever 270'', the latch member 900 is engaged by the cam surface 903' formed on the stop lever 270'' so that the latch member 900 is rocked upwardly against the force of the spring 906. Upon completion of the release movement of the stop lever 270'', the latch 900 is urged by its spring 906 into an operative latching engagement with the notch 903 in the stop lever 270''. Thus the master clutch 250 is allowed to engage, and rotation of the shaft 200 is initiated. Upon initiation of such rotation of the shaft 200 the rotative movement of the driving member 255'' of the shaft 252 is initiated and the clutch dog of the clutch 252 becomes engaged so as to drive the platen mechanism through an operative cycle. The same mode of operation takes place when the stop lever 270' of the clutch 251 is actuated to its released position through actuation of its release rod 866.

After the rotative movement of either one of the clutches 251 or 252 has been initiated, the stop lever 270' or 270'' thereof is released from its latched position through an automatic releasing movement which is imparted to the latch shaft 902 as an incident to the rotative movement of the driven member of the master clutch 250. This releasing action is attained through the medium of the pivot stud 258a of the master clutch which, as shown in Fig. 54 of the drawings, projects to the left in such a degree that during the rotative movement of the driven member of the clutch 250, the pin or stud 258a moves into operative engagement with a release surface 910 formed on the lever 907. Thus as viewed in Fig. 54 of the drawings, it will be evident that in the clockwise rotation of the driven member of the clutch 250, the stud 258a will engage the surface 910 of the lever 907 to cause a counterclockwise rocking movement of the latch shaft 902, and in the course of such rocking movement, either one or both of the stop levers 270' or 270'' which may at that time be latched in their released positions, will be unlatched so that they may return to their operative relationship to their clutches and be thereby conditioned to stop the rotative movement of the driven member of the clutch after the completion of the single revolution thereof.

It will be observed that the two stop levers 270 and 270' are normally urged toward their operative or active relationship to their respective clutches by means of coil springs 911 which, as shown in Fig. 50 of the drawings, are connected between the rods 856 and 866 and the lower flange of the rear wall 144 so as to urge the rods 856 and 866 upwardly and thereby urge the stop levers 270' and 270'' to their active positions and simultaneously urge the levers 854 and 864 to their upper positions. The action of the springs 911 is augmented in the present instance by springs 911' and 911'' which are connected between stationary parts of the frame and the stop levers 270' and 270'' respectively, as shown in Figs. 58 and 60.

The automatic control mechanism

It will be evident from the foregoing description that the present machine may be operated through any desired sequence of "consecutive" printing operations, "skip" operations or "repeat" printing operations through appropriate manipulation of the foot pedals 120, 121 and 122, but in addition to such control the present machine includes provision for automatic control of the operation of the machine so that the operator may, through the use of the pedal 122, perform

repeat printing operations. The arrangement of the automatic control means is such that the machine will, within certain practical limits, automatically print any desired number of impressions from each of the printing devices at printing position, and the number of such printing operations which are to be performed from each printing device may be readily varied to suit the needs of the particular user. Thus, for example, a user may desire to print two impressions from each printing device at printing position, or in other instances a user may wish to print the same impression upon four or five related forms as, for example, when the machine is being used to prepare forms in an insurance company office to take care of all of the bookkeeping records related to a particular policy of insurance.

In attaining the automatic operation which has generally been described hereinabove, the clutch **251** which controls the advancing of printing devices through the machine is provided with a supplemental control means which is automatically operated in timed relation to the operation of the platen mechanism P so as to disable the clutch **251** in accordance with an automatic governing or control means having the desired cycle of operation. Thus as shown in Figs. 52, 54, 56, and 60 to 67, inclusive, the clutch **251** has a supplemental stop lever **920** which is freely pivoted at one end on the shaft **880** and which has a stop lug at its other end which corresponds in form and function to the stop lug of the normal stop lever **270'** of the clutch. Thus, it will be clear that when the stop lever **920** is rotated in a clockwise direction from the inactive position of Fig. 60, to the active position of Fig. 63, the stop lever **920** will dominate the controlling action of the stop lever **270'** and will prevent engagement and operation of the clutch **251**.

The stop lever **920** is in the present instance governed by a rocking control frame **921** which is fixed on a shaft **922** mounted at the forward end of the upper portion of the bearing bracket **202**, as shown in Figs. 51 and 52. The rocking frame **921** is secured on the left-hand end of the shaft **922** as viewed in Fig. 52, while at the other end of the shaft **922** a control arm **923** is fixed so as to project generally rearwardly from the shaft **922**. At its end the control arm **922** has one end of a rod **924** rotatably mounted therein, the rod **924** extending to the right in Fig. 52 and being then bent downwardly so as to extend slidably through a connecting block **925** which is secured on a pivot **926** to one side of the stop lever **920**. Between the block **925** and a washer **927** fixed on the rod **924**, a coil spring **928** is provided which urges the lever **920** downwardly along the rod **924**, and beneath the connecting block **925** a pair of nuts **929** are threaded onto the rod **924** to limit such downward movement of the stop lever **920** along the rod. It will be evident that with this construction, a rocking movement of the frame **921** in a counterclockwise direction as viewed in Fig. 62, will rock the stop lever **920** from its inactive position of Fig. 62 to its active position of Fig. 63. In the present embodiment the rocking frame **921** is normally urged in a clockwise direction such as to tend to maintain the stop lever **920** in its inactive position of Fig. 62. Such normal positioning of the rocking frame **921** is attained by means such as a spring **930** which acts in a rearward direction between a downwardly projecting arm **931** of the frame **921** and a stationary portion of the machine structure, and the stop lever **920** is thrown into its dominating or active relationship by automatic means whenever the clutch **251** is to be disabled for a particular machine cycle. Thus, as shown in Figs. 51, 52 and 53, the rocking frame **921** has a forwardly projecting arm **935** which carries a cam roller **936** normally riding upon the periphery of a disc-like cam **937**. The cam **937**, as shown in Fig. 65, forms a part of a replaceable control assembly **940**. This control assembly has a central sleeve **941** upon one end of which the cam disc **937** is fixed, and upon the other end of which a ratchet wheel **942** is fixed. In the present instance the cam disc **937** is arranged to automatically attain what may be termed "duplicate" operation of the machine, and in such duplicate operation the printing device advancing clutch **951** is disabled in alternate operations or cycles of the machine, thereby to cause printing of two impressions from each printing device at printing position.

It will be understood, of course, that the cam disc **937** could have other forms so as to obtain a different number of printing impressions from each of the printing devices, and when a different cam formation is to be employed, the entire assembly **940** is removed and a different assembly **940** is substituted, this practice being followed because by such procedure the ratchet wheel **942** may be made in each instance to correspond with the particular form of cam disc **937**.

In the present instance the control assembly **940** is mounted on a bearing stud **942** which is secured by means of a shoulder **943** and a clamping nut **944** in a forwardly projecting bearing portion of the bearing bracket **202**, as will be evident in Fig. 54 of the drawings. The control assembly **940** is held in place on the bearing stud **942** by means of a knurled cap screw **945** which is threaded into the end of the bearing stud **942**.

As shown in Fig. 53 of the drawings, the cam disc **937** has a plurality of elevated surfaces **946** and a plurality of depressed surfaces or recesses **948** which are alternately and evenly spaced about the periphery of the cam disc **937**. When one of the recesses **948** is moved into alignment with the cam roller **936**, the roller **936** moves into the recess and the control or rocking frame **921** moves in a clockwise direction under the influence of its spring **930** to the extent shown in Figs. 53 and 60, with the result that the arm **923** lifts the stop arm **920** to its inactive position of Fig. 60. When, however, the cam disc **937** is moved so as to bring one of the elevated surfaces **946** into alignment with the cam roller **946**, the control or rocking frame **941** is rocked in counterclockwise direction from the position of Fig. 62 to the position of Fig. 63 so that the stop lever **920** is rocked in a clockwise direction to its active position of Fig. 63.

The came or control assembly **940** is actuated or rotated about its mounting stud **942** automatically and in timed relation to the operating movements of the platen mechanism P, and this operation is attained in the present instance by an operating connection between the platen driving mechanism and the ratchet wheel **942**. To this end the shaft **296** of the platen actuating means extends considerably to the left from its point of connection with the arm **295'**, as shown in Fig. 53, and an arm **950** is secured thereon. The arm **950** has a link **951** secured thereto and projecting rearwardly in a plane which is located just to the right of the plane of the ratchet wheel **942**, as viewed in Fig. 52 of the drawings. The

rear end of the link 951 is urged upwardly by means of a spring 952 which is connected at its upper end to a pin 953 set in the outer or left-hand face of the girder 331. The lower end of the spring 952 is anchored on a pin 954 that projects from the link 951 to the right, as viewed in Fig. 52. The right-hand end of the pin 954 projects into a longitudinal guide slot 955 formed in a guide link 956 which is mounted at its upper end about the anchoring stud 953 and which projects downwardly along the side of the spring 952 to aid in guiding the link 951 and preventing lateral movement thereof.

The spring 952 tends to draw the rear end of the link 951 upwardly so as to engage a laterally projecting pin 960 on the link 951 with the teeth 961 of the ratchet wheel 942, it being noted that the link 951 is reciprocated through a longitudinal stroke each time the shaft 296 is rocked. It will also be observed that there is one ratchet tooth 961 for each of the recesses 948 and for each of the elevated surfaces 946, so that in each operation of the platen mechanism P the rocking movement of the shaft 296 causes the control assembly 940 to be advanced an angular distance equal to the angular displacement of the adjacent ratchet teeth 961. For the purpose of holding the control assembly 940 in the rotative position to which it is actuated by the link 951, a spring pressed detent plunger 962 is provided in the bearing bracket 202 as shown in Fig. 66, and this detent plunger 962 is pressed into engagement with a plurality of angularly spaced detent recesses 963 which are formed in the ratchet disc 942 at angularly spaced positions which correspond with the angular spacing of the ratchet teeth 961.

It will be recognized, of course, that the automatic controlling action of the control assembly 940 is not desired at all times and provision is therefore made to disable this control assembly when "repeat" operation of the machine is not desired, or when the normal or "consecutive" operation of the machine is desired. Such a disabling or controlling action is in the present instance attained by a control plate 965 which is rockably mounted on a bearing member 966 which is carried on the mounting stud 942 adjacent to the bracket 202 and which is held in position by means of a shoulder 967' formed on the mounting stud 942. The control plate 965 has a finger 967 formed thereon which in one position of the control plate is adapted to engage the upper surface of the actuating link 951 as shown in Fig. 61 so as to prevent engagement of the pin 960 with the teeth of the ratchet wheel 942. This disabling action of the finger 967 of the control plate 965 is attained when the control plate 965 is in its most counterclockwise position of Fig. 61, and the control plate 965 is shiftable to this position through the medium of a control plunger 970 which projects through the front panel 142 and has a control finger piece 971 located in one of the recesses 142' of the front panel. In the present instance this control finger piece 971 is located at the lower end of the left-hand recess 142, as seen in Fig. 1 of the drawings. The plunger 970 is connected to the control plate 965 by means of a link 975 which is pivoted at its rear end to the plunger 970 as at 976 and is pivoted at its forward end at 977 to an upper portion of the control plate 965.

It will be observed that the plunger 970 has a plurality of longitudinally spaced detent notches 978, 979 and 980 adapted to cooperated with a spring pressed detent 981 (Fig. 60) to maintain the plunger 970 in any one of three positions of longitudinal adjustment. Thus, when the plunger 970 is pressed to its innermost position as defined by the detent notch 978, the control plate 965 is located in the position shown in Fig. 60 and Fig. 61, and in this position of adjustment the machine is conditioned for "consecutive" or normal operation. When the machine is thus adjusted for normal or "consecutive" operation, the finger 967 is positioned as shown in Fig. 61 so as to prevent operative engagement of the pin 960 with the ratchet wheel 942. When the plunger 970 is withdrawn to an intermediate position as defined by the engagement of the detent notch 979 with the detent 981, the parts are positioned as shown in Fig. 62 of the drawings so as to automatically attain a multiple printing action as determined by the characteristics of the control assembly 940.

When the plunger 970 is fully withdrawn so as to engage the detent notch 980 with the detent 981, in the manner illustrated in Fig. 67 of the drawings, a projecting arm or cam surface 983 formed on the control plate 965 is engaged with a projecting finger 984 provided at the end of the arm 935. Thus the cam surface 983 holds the control frame 921 in its most counterclockwise position so as to constantly maintain the stop lever 920 in its active position of Fig. 67. The reciprocating link 951 is also engaged at this time by a shoulder 983' formed on the control plate 965 so as to prevent operation of the cam assembly 940. Thus in the "repeat" adjustment of the plunger 970, as shown in Figs. 67 and 68, the printing device advancing means is permanently or constantly disabled, and a series of printing impressions are made from a single printing device at printing position. This adjustment of the control plunger 970 attains the same action as if the operator were to use the repeat pedal 121, but some operators prefer to employ the "repeat" adjustment or setting provided by the plunger 970, thereby to enable them to use the control pedal 122 in the same manner which they employ when the machine is being operated in "consecutive" work.

When the machine is being used under the governing action of the control assembly 940 to produce a particular or selected number of printing impressions from each of the printing devices, it is obviously desirable to insure completion of the desired number of printing impressions from a particular plate before shifting the plunger 970 to its "consecutive" position or setting, and means is provided in the present machine to prevent such shifting of the control plunger until the desired number of printing impressions have been made from a particular printing device. This means in the present instance comprises a latch lever 990 having a downwardly facing notch 991 therein adapted to be engaged with a relatively stationary means such as the projecting pin 984 on the arm 935. The latch lever 990 projects in a rearward direction from the pivot pin 977 and is urged downwardly by means of a spring 992 to a lower limit determining by a stop lug 990' formed on the plate 965. The proportioning of the latch lever 990 is such that when the plunger 970 is adjusted for multiple printing as shown in Figs. 62 and 63, the notch 991 is locaed directly over the pin 984. Thus, when the roller 936 is on one of the high points 946 of the cam 937, the

pin 984 is located in the notch 991, as shown in Fig. 63, so as to prevent longitudinal shifting of the plunger 970 in either direction. It is, therefore, necessary to operate the machine through one or more additional cycles until the roller 936 rides into one of the recesses 948 so as to disengage the pin 984 from the notch 991. The plunger 970 may then be adjusted to the new relationship which is desired.

In the operation of the ratchet assembly 940 by the reciprocating link 951, it will be observed that a pin 993 which projects laterally from the top lever 270' as shown in Fig. 54 normally overlies the top of the rear end of the lever 951 as shown in Fig. 62, and when the top lever 270' is in its operative or active position of Fig. 62, the pin holds the rear end of the link 951 in a downward position which is such that the pin 960 would not strike the ratchet teeth in a forward reciprocation of the link 951. It will be recalled, however, that when the machine is being used in the automatic multi-print position of adjustment, the foot pedal 122 is employed to initiate each printing operation of the machine. Such actuation of the foot pedal 122 causes the stop lever 270' to be retracted so as to tend to release the clutch 251 and permit engagement thereof. Such engagement is, of course, prevented in certain cycles of machine operation by the supplemental stop lever 920. When the stop lever 270' is moved to its inactive position or in a counterclockwise direction in Fig. 62, the pin 993 carried thereby is elevated to the position shown in Fig. 64 of the drawings, and as a result, the rear end of the link 951 is allowed to move upwardly under the influence of the spring 952 so that in the course of the forward movement of the link 951, the pin 960 engages one of the ratchet teeth 961 so as to advance the control assembly 940 in the desired amount.

The stop lever 270', when it is thus actuated to its inactive position, is latched in this position by the associated latch member 901 and is maintained in this elevated position for a short period until rotative movement of the shaft 200 has been initiated by engagement of the master clutch 250. The stop dog 270 then moves downwardly, but in such movement it strikes the outer periphery of the driven member of the clutch 251 so that such downward movement is insufficient to move the link 951 and its pin 960 beyond the range within which it will engage with the ratchet wheel 942.

With respect to the operation of the stop levers 270' and 920 in those cycles of operation wherein the stop lever 920 is effective to prevent engagement of the clutch 251, it will be observed that the stop lever 920 must be effective to retard or restrain the clutch pawl of the clutch 251 for only a relatively short period, this period being just sufficient to permit the stop lever 920 to remain active until the stop lever 270' has been released or unlatched for a return to its normal active position. Thus, when the cam roller 936 is engaged with a high point 946 on the cam 937, as shown in Fig. 64 of the drawings, the stop lever 920 is located in the active position there shown, and in initiating the desired cycle of operation by means of the foot pedal 122, the stop lever 270' is withdrawn and latched in the retracted position shown in Fig. 64. Hence, the stop lever 920 prevents engagement of the clutch 251, but since the clutch 252 has become engaged and has started the counterclockwise rotation of the shaft 296, the pin 960 of the reciprocable link 951 shifts forwardly and upwardly so as to start the counterclockwise rotation or advancing movement of the cam assembly 940. Before this advancing movement of the cam assembly has progressed sufficiently to move one of the recesses 948 into alignment with the cam roller 936, the rotation of the driven member of the master clutch 950 acts upon the lever 907 to release the latch 901. As a result, the stop lever 270' is returned to its active relationship to the pawl of the clutch 251 prior to the withdrawal of the stop lever 920, and hence the clutch 251 is maintained disengaged.

When a machine cycle is started by means of the foot pedal 122 while the cam roller 936 is in engagement with a recess 948 of the cam, the stop lever 920 is in the retracted or inactive position shown in Fig. 62 of the drawings. Hence, the withdrawal of the stop lever 270' which is caused by the actuation of the food pedal 122 permits the clutch 251 to become engaged. At this same time the clutch 252 has become engaged and has started the forward movement of the link 951, as hereinbefore described, so that during the rotation of the driven member of the clutch 251, the cam assembly 940 is advanced from the position shown in Fig. 62 to the position shown in Fig. 63, thereby to force the stop lever 920 in a clockwise direction and against the periphery of the driven member of the clutch 251. The stop lever 270' is, of course, unlatched during the course of such operation so that both of the stop levers, that is the stop levers 270' and 920, function in terminating this one-revolution cycle of the clutch 251. While the stop lever 920 is bearing against the periphery of the driven member of the clutch 251 as shown in Fig. 63, the spring 928 is under a slight compression, so that when the end lug of the stop lever 920 is engaged by the pawl of the clutch 251, the spring 928 may function to force the end of the lug into the recess 624 in the driven member of the clutch 251 to the position shown in Fig. 64 of the drawings.

As hereinbefore pointed out, the safety latch 990 insures that the stop lever 920 will be withdrawn from its active relationship whenever the machine is changed from the multi-print position or adjustment of Fig. 62 to one of its other positions of adjustment.

Safety means for printing device feed

In the operation of a machine of the character herein disclosed, the proper refiling of the printing devices D in the drawer from which they are removed, and in which they are normally stored, is an important element in maintaining maximum workability of the system as a whole, and the present machine, therefore, provides means which enforces proper positioning of the collector K before the printing device feeding means may be operated to feed printing devices through the machine.

In a broad sense, this end is attained through interlocking means which is effective when the drawer holder or carrier 750 is tipped downwardly or in loading position to prevent operation of the printing device feeding means. In the preferred form herein shown this safety means is associated with the lever system of the foot pedal control means. Thus as shown in Figs. 47 to 50, a rock shaft 995 is mounted in the supporting members 148 just below the rock shaft 855, and on the rock shaft 995 an arm 996 is fixed so as to project rearwardly therefrom. A link 997 is pivoted at its lower end to the end of the arm 996 and extends upwardly for connection with a stud or

rigid arm 998 which projects from one side of the drawer holder or carrier 850 rearwardly of the pivot 751. The connection between the fixed arm 998 and the link 997 is rendered adjustable by means of lock nuts 999 threaded on the link above and below the fixed arm 998. Thus when the drawer carrier 850 is rocked downwardly at its forward end from its normal position of Fig. 48 to the unloading position of Fig. 49, the rear end of the arm 996 is raised and the rock shaft 995 is rocked in a counterclockwise direction as viewed in Figs. 48 and 49. At its right-hand end as viewed in Figs. 47 and 50, the rock shaft 995 has a locking dog 1000 in the form of an arm fixed to the rock shaft 995 for rocking movement therewith. The locking dog 1000 is adapted when it is thus rocked upwardly to move into a locking notch 1001 formed in the lower edge of the lever arm 854, thereby to block downward movement of the lever arm 854.

Since the lever arm 854 must be rocked downwardly in order to actuate the clutch stop lever 270' of the clutch 251 which controls the printing device advancing means of the present machine, it will be obvious that when the locking dog is in its active position of Fig. 49, the printing device advancing means of the machine cannot be operated. The arrangement of the present safety means is such that when the locking dog 1000 is in its lowered position, that is, when it is rocked in a downward or clockwise direction from its active position of Fig. 49, all of the foot pedals 120, 121 and 122 may be operated in their normal manner. When, however, the locking dog 1000 is in its active position of Fig. 49, only the central pedal 121 may be operated. Such operation of the foot pedal 121, however, results merely in the operation of the platen mechanism, and the printing device advancing means remains inactive. With the locking dog 1000 in its active position, it will be evident that actuation of the foot pedal 120 will act through the connecting link 850 merely to pull the lever arm 954 down more firmly against the locking dog 1000. As hereinbefore pointed out, however, the actuation of the foot pedal 121 under such conditions will actuate the associated lever arm 864 to produce operation of the platen clutch 252, but since such actuation of the lever arm 864 merely withdraws the lever arm 864 downwardly from beneath the overhanging lug of the arm 873, such actuation of the foot pedal 121 has no effect upon the lever arm 854 which must be actuated downwardly in order to produce operation of the printing device advancing means.

In the event that an operator endeavors to actuate the foot pedal 122 when the locking dog 1000 is in the active position of Fig. 49, the link 870 acts on the arm 871 to impart but a slight rocking movement to the rock shaft 855. In such slight rocking movement the lug 875 of the arm 873 which is fixed to the rock shaft 855 moves firmly into engagement with the top of the lever arm 854 and serves merely to press the lever arm 854 into a tighter engagement with the end of the locking dog 1000. Hence, the attempted actuation of the foot pedal 122 will be ineffective to produce operation of the printing device advancing means, and the objectionable advancing movement of printing devices will be avoided and prevented until the drawer carrier 750 has been returned to its normal elevated position of Fig. 48. It will be recognized, of course, that an operator will not normally return the drawer 750 to its normal position without a drawer K in position thereon, and hence the interlocked relationship of the drawer carrier 750 with the printing device advancing means insures that the printing devices will be returned to the drawer and properly refiled therein in the desired sequence.

Auxiliary mechanisms

As hereinbefore pointed out, the present machine has a wide range of adaptability so that it may be manufactured in a relatively inexpensive standard model, and this standard model is so constructed and arranged that it may be readily modified so as to perform other operations or functions which are not ordinarily included in the standard or basic model of the machine. As an example of the ready adaptability of the present machine for the incorporation or addition of supplemental mechanisms of various types, the machine has been illustrated in Figs. 69 to 73, inclusive, in the form which it takes when the user desires to employ an automatic sheet feeding means in association with the machine. As illustrated in Figs. 69 to 73, inclusive, the machine is arranged for association with an automatic sheet feeder of the type illustrated and claimed in the co-pending application of Morse, Serial No. 403,282 filed July 21, 1941, but it will be understood that other types of sheet feeders may in certain instances be associated with the present machine. In adapting the present printing machine for use with an automatic sheet feeder, the changes or additions in the machine are relatively simple. The sheet feeder disclosed and claimed in the aforesaid application of Morse is of such a construction that parts of the frame of the sheet feeder are located along the end walls 130 and 131 of the printing machine, and in order that the sheet feeder may be readily placed in its operative relation to the printing machine, means are provided for detachably interconnecting the end walls 131 of the printing machine with the adjacent portions of the frame of the sheet feeder.

As illustrated in Fig. 72 of the drawings, the sheet feeder has a frame portion 1005 which is located adjacent the end wall 131 whenever the sheet feeder is in its operative relationship with respect to the printing machine. It will be observed, of course, that a frame portion similar to the frame portion 1005 would be located adjacent to the end wall 130 of the printing machine. It is desirable, of course, to have the sheet feeder located in a predetermined relation to the printing position of the printing machine, and it is particularly important that this relationship in a vertical direction be accurately determined each time the sheet feeder is brought into operative association with the printing machine. In accomplishing this purpose a mounting rail 1006 in the form of an angle bar is secured as by welding in a horizontal relationship along each of the end walls 130 and 131 as indicated in Figs. 70, 72 and 73, and the sheet feeder is supported upon these mounting rails 1006 when it is in its operative relationship to the printing machine. For the purpose of affording such support, each frame 1005 is provided with a plurality of rollers 1007 adapted to rest upon the mounting rails 1006 to locate the sheet feeder in a predetermined vertical relationship to the printing machine.

The location of the sheet feeder along the rails 1006 is, of course, important in order that the sheets fed by the sheet feeder will be properly positioned at printing station. Such posi-

tioning of the sheet feeder along the rails 1006 is in the present instance attained by a readily releasable connection provided by a securing block 1008 which is fixed in position on the rail 1006 by means of a thumb screw 1009. On the securing block 1008 a latch pawl 1010 is pivoted by means of a pivot pin 1011. Adjacent its free end the latch pawl 1010 has a latching recess 1012 which by pivotal movement of the latching pawl 1010, may be moved downwardly into an embracing relationship with the rear one of the rollers 1007. Thus the position of the sheet feeder along the rails 1006 is accurately determined by engagement of the recess 1012 of the pawl 1010 with the roller 1007. It will be understood, of course, that such latching structure is provided on each of the mounting rails 1006 so that both ends of the sheet feeder are held in an accurately determined position along the rails 1006. Preferably the latch pawl 1010 is held releasable in its active position of Figs. 72 and 73 in order to make sure that vibration of the machine will not cause the sheet feeder to be released. In the present instance this securing means comprises a stud 1013 threaded through the pawl 1010 and having a reduced end 1014 adapted to be engaged with a bore or recess formed in the securing block 1008. When the pawl 1010 is to be released, the stud 1013 is unscrewed in an amount sufficient to withdraw the reduced end 1014 from the bore 1015. Thus the pawl 1010 is released and may be rotated upwardly out of engagement with the roller 1007.

When such a sheet feeder is operatively associated with the printing machine, the feeding operations of the sheet feeder must be coordinated with the printing operations of the printing machine, and with the printing machine of the present invention, such a coordinated relationship may be attained through means of a simple control connection which is associated with the main drive of the printing machine in the space located just to the left of the main drive mechanism. This space is shown in Fig. 3 of the drawings. In attaining such an operative interrelationship, the sheet feeding mechanism is in the present instance connected to the main drive of the printing machine so that the sheet feeding means may be actuated each time the printing machine is operated through a printing cycle. Thus, as shown in Figs. 69 to 71, inclusive, an actuating shaft 1020 for the sheet feeder is mounted so as to project through an aperture 1021 in the end wall 131 of the printing machine frame. The shaft 1021 has a connecting disc 1022 fixed on its projecting end and the disc 1022 is adapted to be operatively connected to an actuating link 1023 of the sheet feeder by means of a connecting pin 1024 which may be screwed into a threaded, eccentrically positioned bore 1025 formed in the disc 1022. The shaft 1021 is supported somewhat beneath the mounting bar 134 by means of a bracket 1030 which is bolted to the bar 134. At its other or right-hand end, as viewed in Figs. 69 and 70, the shaft 1021 has a gear 1031 fixed thereto and this gear 1031 is meshed with a driving gear 1032 which is rotatably mounted on the shaft 200 intermediate the sleeve 255 and the bearing bracket 201. It will be observed in Fig. 55 of the drawings that a spacing member 1035 is normally positioned on the shaft 200 between the bracket 201 and the sleeve 255, and when the machine is to be adapted for use with the sheet feeder, the spacing member 1035 is removed and the gear 1032 is substituted therefor.

As hereinbefore pointed out, the gear 1032 is freely mounted on the shaft 200, and whenever a sheet feeding operation of the sheet feeder is desired, the gear 1032 is operatively connected to the driving mechanism so as to be rotated through a single revolution cycle. This end is attained by a one-revolution clutch 1036 which is somewhat similar to the clutches 250, 251 and 252. In this clutch the sleeve 255 which rotates with the driven pulley 204 constitutes the driving member of the clutch and is appropriately formed in the manner hereinbefore disclosed with relation to the other clutches. The driven member of the clutch 1036 comprises a shell-like member 1037 having a clutch pawl 1038 formed substantially like the clutch pawl 258. The clutch pawl 1038 is adapted to be engaged by a stop lever 1039 which is urged toward its operative position of Fig. 71 by means of a spring 1040. The stop lever 1039 is mounted on a pivot pin 1041 carried in a supporting bracket 1042 which is fixed on the mounting bar 134.

For the purpose of actuating the stop lever 1039 to an inactive position whenever the sheet feeding means is to be driven through an operating cycle, the clutch 1036 is operatively associated with and controlled by the platen mechanism of the printing machine. Thus, as shown in Fig. 71, the shaft 296 is extended to the left, beyond the point of connection of the lever arm 950 therewith, and a lever arm 1045 is fixed thereon as shown in Fig. 71. The lever arm 1045 is operatively associated with the stop lever 1039 of the clutch at 1036 by means of a link 1046. This link has its forward end pivoted at 1047 to the end of the arm 1045 while at its rear end the link has a longitudinal slot 1048 which embraces the pivot pin 1041 and provides for reciprocating movement of the link 1046 in each operating cycle of the platen mechanism. In the course of such reciprocating movement, the link 1046 first shifts the stop lever 1039 to its inactive position so as to permit the clutch 1036 to engage, and thereafter permits the stop lever 1039 to return to its active position so as to disengage the clutch 1036 at the end of its one revolution cycle. Such operation of the stop lever 1039 is attained by means of a cam roller 1059 mounted on the stop lever 1039 and adapted to be engaged by a cam surface 1051 formed on the link 1046. The cam surface 1051 is located rearwardly of the cam roller 1050, as shown in Fig. 71, and when the platen mechanism starts through an operative printing cycle, the link is shifted forwardly so that the cam roller 1050 is engaged by the cam surface 1051 and the stop lever 1039 is thereby shifted to its released or inactive position. Prior to the time when the clutch 1036 completes its one-revolution cycle, the return movement of the platen mechanism causes the link 1046 to be moved rearwardly toward the position shown in Fig. 71. Thus the stop lever 1039 is returned to its active position in sufficient time to terminate the one-revolution cycle of the clutch. Thus the basic machine disclosed herein may be readily modified to adapt the machine for use with an automatic sheet feeder.

When the printing machine of the present invention is employed with an auxiliary mechanism such as an automatic sheet feeder, it is desirable to provide for continuous operation of the printing machine, rather than to initiate each

cycle of operation by actuation of the consecutive foot pedal 122, and when such continuous operation of the printing machine is employed, it is desirable to provide for automatic stopping of the machine under certain circumstances such for example as the exhaustion of the supply of printing devices D in the magazine M or the exhaustion of the supply of sheets which are being fed by the automatic sheet feeder. The basic machine disclosed herein may be readily adapted for such continuous and automatically terminated operation by means of an auto-stop mechanism 1060 which is governed by control plunger 1061 mounted in the front panel 142, the auto-stop mechanism 1060 being operable to produce continuous operation of the printing machine, and being responsive to the detection of certain undesirable conditions to automatically terminate such continuous operation of the machine.

Thus the auto-stop mechanism 1060 embodies a mounting bracket 1062 secured as by means of bolts 1063 along the forward edge of the front mounting bar 136. The mounting bracket 1062 has a forwardly extending vertical wall portion 1064 along the upper edge of which a flange 1065 is provided as shown in Figs. 76 and 77. Along the lower edge of the vertical wall portion 1064 a lower flange 1066 is provided, and the control plunger 1061 is arranged to slide along the upper surface of the flange 1066 and to be held in position thereon by a guide roller 1068 which engages the upper face of the plunger 1061 as shown in Fig. 76 of the drawings.

The plunger 1061 is arranged for reciprocation between an inner position shown in Fig. 74 and an outer or withdrawn position shown in Fig. 77, and when the plunger is withdrawn, means which is provided in association with and controlled by the plunger is operable to initiate continuous operation of the machine, and this continuous operation is terminated only when the plunger 1061 is returned to its innermost position of Fig. 74. In the present instance the controlling action of the plunger 1061 is exerted upon the machine through actuation of the upper rock shaft 855 in a manner which is equivalent to continuous depression of the consecutive foot pedal 122. Thus as shown in Figs. 74 and 75, a bracket 1070 is mounted on the rear face of the skirt 138 somewhat to the right of the right-hand end of the upper rock shaft 855 and a stub shaft 1071 has one end mounted in the bracket 1070 and the other end coupled to the rock shaft 855 by means of a coupling 1072. An arm 1073 is fixed on the stub shaft 1071 so as to project rearwardly therefrom, and another arm 1074, loosely mounted on the stub shaft 1071 and projecting rearwardly therefrom, has an ear 1075 projecting laterally therefrom so as to overlie the arm 1073. Thus when the arm 1074 is rocked downwardly, a corresponding rocking movement is imparted to the arm 1073 and to the rock shaft 855, and yet the rock shaft 855 may be actuated when desired by the foot pedal 122 without interference by the arm 1074.

The desired actuation of the arm 1074 from the auto-stop plunger 1061 is attained by a link and lever system shown in Figs. 74 to 76. Thus a rod or link 1078 extends upwardly from the end of the arm 1074 and is connected by means of a swivel block 1079 to one arm of a bell crank formed by a triangular plate 1080. The plate 1080 is pivoted at 1081 on a bracket 1082 which is mounted at the upper end of the skirt 138. The other arm of the bell crank provided by the plate 1080 is operatively connected to the plunger 1061 by means of a link 1083 which extends forwardly along the left-hand side of the mounting bracket 1062 of the auto-stop means. At its forward end the link 1043 is pivoted at 1084 to the downwardly projecting arm 1085 of a bell crank 1086 which is pivoted at 1087 on the vertical side wall 1064 of the bracket 1062. The bell crank 1086 is located on the left-hand side of the wall 1064 and has an arm 1088 extending forwardly from the pivot 1087. At its forward end the arm 1088 has a cam roller 1089 which projects to the right as viewed in Fig. 76 and is adapted to be seated in a downwardly facing cam recess 1090 formed in the lower face of the plunger 1061. A spring 1091 acting between the arm 1088 and an anchoring pin 1092 tends to hold the roller 1089 against the lower surface of the plunger 1061 and to seat the roller 1089 in the cam recess 1090 when the plunger 1061 is in its innermost or rearward position of Figs. 74 and 75. Thus when the plunger 1061 is in its innermost position, the spring 1091 so actuates the bell crank 1086 that the control arm 1074 is held in its elevated position. Hence the machine will not operate unless, of course, the operator actuates one of the foot pedals 120, 121 or 122. When continuous operation of the machine is to be instituted the plunger 1061 is withdrawn to the position shown in Fig. 77, thereby to rock the bell crank 1086 in a counterclockwise direction and cause rocking movement of the upper rock shaft 855. Thus the stop levers 270, 270' and 270'' are withdrawn to their inactive positions and the machine operates continuously so long as the auto-stop plunger 1061 remains withdrawn.

While the plunger 1061 may, of course, be returned to its rearward position at any time in order to stop the continuous operation of the machine, means is also provided to automatically return the plunger to its rearward position in response to the detection of certain undesirable conditions. For this purpose a bell crank 1100 is mounted at 1101 on a pivot pin projecting to the right as viewed in Fig. 76 from the wall portion 1064 of the bracket 1062. The bell crank 1100 is adapted to move between two positions, one of which is illustrated in Fig. 77 of the drawings, this position being limited by engagement of an arm 1102 of the bell crank with the upper flange 1065. The bell crank 1100 is maintained in either one of its two positions by the over-center action of a spring 1103 which acts between an anchoring pin 1104 and a projecting pin 1105 mounted on the other arm 1106 of the bell crank. When the bell crank 1100 is rocked in a counterclockwise direction from its position of Fig. 77, the arm 1106 thereof strikes a pin 1108 which projects from one side of the plunger 1061, and as the counterclockwise movement of the bell crank 1100 progresses the plunger 1061 is returned to its rearward or innermost position wherein continuous operation of the printing machine is terminated.

The required counterclockwise actuation of the bell crank 1100 is in the present instance initiated by means such as a solenoid 1110 which is mounted in a vertical position on the lower portion of the side wall 1064 and which has its armature 1111 connected by a link 1112 to the forward end of the arm 1102 of the bell crank

1100. Thus when the solenoid 1110 is energized the armature 1111 is withdrawn in a downward direction, thereby to rock the bell crank 1100 in a counterclockwise direction to an over-center position such that the spring 1103 continues the counterclockwise movement of the bell crank 1100 even though the energization of the solenoid 1110 is but momentary.

The solenoid 1110 may be energized in response to the detection of a variety of different undesirable conditions, such for example as the detection of a double feed, or the absence of a sheet in an automatic sheet feeder such as that disclosed in the aforesaid co-pending application of Morse, Serial No. 403,282; or in response to the last-impression detecting means of a lister mechanism such as that disclosed in my aforesaid co-pending application Serial No. 410,097. I have, however, for purposes of the present disclosure, illustrated a detecting means associated with the magazine M and operable to detect the withdrawal of the last printing device from the magazine M, and when such feeding of the last printing device is detected, the solenoid 1110 is energized to terminate the continuous operation of the printing machine. For this purpose a rocking detecting lever 1120 is mounted on a pivot pin 1121 which is carried in a bracket 1122 secured to the right-hand side of the girder 300 immediately below the magazine M. The detecting lever 1120 has a finger 1123 at its upper end which is adapted to project into the magazine M just rearwardly of the guide flange 393. When the finger 1123 is moved inwardly or to the left in Fig. 78 and comes into contact with the end of a printing device D, its movement is limited by such contact, but when the supply of printing devices in the magazine M has been exhausted, the detecting lever 1120 is free to move to a greater extent to the left in Fig. 78 and in such additional movement an adjustable insulating plunger 1125 carried on the arm 1123 engages one contact of a normally open spring contact switch 1126 so as to close the switch 1126. Hence such closure of the switch 1126 may be utilized to energize the solenoid 1110, thereby to terminate continuous operation of the machine. The control circuit from the switch 1126 to the solenoid 1110 is illustrated in Fig. 80 of the drawings wherein it will be seen that a wire 1127 is connected from one contact of the switch 1126 to a point 1128 in the main drive motor circuit which is under control of the main motor switch 206. A wire 1129 is connected from the other side of the main motor circuit to one contact of a normally closed conditioning switch 1130 which is incorporated in the auto-stop mechanism. Thus as shown in Fig. 77 of the drawings, the normally closed switch 1130 is mounted on the bracket 1062 so that the upper end 1131 of one of the spring contacts thereof lies in the path of insulating roller 1132 carried on the plunger 1061. The mounting and arrangement of the switch 1130 are such that when the plunger 1061 is withdrawn to its outer position the switch 1130 is closed, while the plunger 1061 in its inward movement to its innermost position serves to open the switch 1130. The other contact of the switch 1130 is connected by means of a wire 1133 to one side of the actuating coil of the solenoid 1110 while wires 1134 and 1135 in series are employed to connect the other side of the solenoid 1110 to the other terminal of the switch 1126. Thus when the auto-stop plunger 1061 is in its withdrawn position, the conditioning switch 1130 completes a circuit to one side of the solenoid 1110, and when the withdrawal of the last printing device from magazine M is detected by the detecting lever 1120 so as to close the switch 1126, the solenoid 1110 is energized and the automatic operation of the printing machine is terminated. In order to provide for energization of the solenoid 1110 in response to the action of other types of detecting means, a plug outlet or receptacle 1136 is preferably mounted on the left-hand end panel of the machine frame 100, and the terminals of the plug outlet or receptacle 1136 are connected in parallel with the switch 1126 by wires 1137 and 1138 which are connected respectively to the wires 1137 and 1134.

In order that the detecting finger 1123 may be in contact with the printing devices D only when such printing devices are at rest within the magazine, means is provided for actuating or rocking the detecting lever 1120 in timed relation to the printing device advancing means. To this end a rocking lever 1140 is mounted on the pivot shaft 1121 immediately to the left of the detecting lever 1120 as viewed in Fig. 79, and a pin 1141 projects from the lever 1140 through a relatively large opening 1142 formed in the lever 1120. A spring 1143 connected between an anchoring pin 1144 on the lever 1140 and an anchoring pin 1145 which projects downwardly from the lower edge of the girder 300, acts to rock the lever 1140 in a clockwise direction as viewed in Fig. 78, and the pin 1141 tends normally to transmit this action to the detecting lever 1120 thereby to withdraw the detecting finger 1123 from the magazine M. Such withdrawing movement is limited by engagement of a stop finger 1146 with the lower face of the girder 300 as viewed in Fig. 78 of the drawings. When the detecting finger 1123 is to be projected into the magazine M, the rocking lever 1140 is rocked in a counterclockwise direction as viewed in Fig. 78, and such movement is transmitted yieldingly to the lever 1120 by means of a spring 1147 which is connected between the pin 1141 and a pin 1148 which projects from the lever 1120 somewhat to the right of the pin 1141 as viewed in Fig. 78.

The desired actuation of the rocking lever 1140 is attained in the present instance by means associated with the printing device advancing means, and to this end a cam plate 1150 is fixed to the right-hand end of the shaft 296 as shown in Fig. 74. The cam plate 1150 has an end flange 1151 having a cam surface 1152 thereon which is adapted to engage a cam roller 1153 mounted on the rocking lever 1140. Thus as shown in Figs. 74, 78 and 79, the cam roller 1153 is mounted on a stud 1154 which projects angularly and in a downward direction from a mounting ear 1155 formed on the rocking lever 1140. The cam plate 1150 and the cam surface 1152 thereof are so formed and positioned on the shaft 296 that the cam roller 1153 is engaged by the cam surface 1152 just prior to the completion of the forward movement of the carrier bars 401 and 402 so that the detecting finger 1123 is urged inwardly with respect to the magazine M at a time when the printing devices in the magazine are at rest. Thus when the rocking movement of the shaft 296 is reversed in the last half of the cycle of operation of the printing device advancing means, the cam surface 1152 is withdrawn from its engaging relation with respect to the cam roller 1153 and the spring 1143 acts to withdraw

the detecting finger 1123 from the magazine M.

It will be evident that the incorporation of the auto-stop mechanism, and the detecting means for sensing the withdrawal of the last printing device from the magazine may be incorporated in the present printing machine in a simple and expeditious manner so that the basic machine disclosed herein is adapted for quantity manufacture in its most simple form and may be readily and easily modified to provide for a wide range of automatic operation.

Operation

In the operatiton of the present machine, the printing devices which are to be passed through the machine are first loaded into the magazine M. This is accomplished by sliding the front cover member 388 in an upward direction and then pivoting the same to the left as viewed in Fig. 1. The drawer in which the printing devices have been stored or filed is then placed in position with the rear end of the drawer resting on the guide tracks 391 of the guide member 390 and between the two side guides 392. The slide follower member 389' is then unlatched by actuation of its latch member 732 and the slide follower and all of the printing devices D in the drawer are shifted rearwardly to the rear end of the drawer. The forward end of the drawer is then rotated or shifted upwardly until the upper edges of the printing devices move into contact with the guide surfaces 385 of the magazine. The magazine M is then tipped rearwardly about its pivot and the lower end of the drawer is withdrawn, the drawer in such movement being pivoted about its upper end so as to leave the printing devices in a stack resting upon the supporting fingers 386 and the guide surfaces 385. The front cover member 388 is then pivoted to the right so as to engage the forwardly facing lower edges of the printing devices in the magazine, and the hopper is tipped forwardly to its normal upright position wherein the spacing flanges of the lowermost printing device come to rest on the upper surfaces 413 of the carrier bars 401 and 402.

After making sure that the platen roller PR of the platen mechanism has platen faces PF thereon which will obtain the desired cut-off action, as fully explained in my co-pending application Serial No. 361,530, filed October 17, 1940, the motor 205 is started by closure of the main motor switch 206, such closure of the switch 206 being effected by actuation of the control plunger 207 located in the front panel 142 of the machine.

The machine is then in condition for feeding of printing devices D from the magazine M to printing position, and such preliminary feeding of the printing devices through the printing device guideways is effected by actuation of the "skip" foot pedal 120 which causes the printing device advancing mechanism to operate while the platen mechanism P remains inactive. In this preliminary or conditioning operation of the machine, the foot pedal 120 is actuated downwardly four times so that four printing devices D are withdrawn and advanced one by one from the magazine M. Thus the first printing device which has been thus advanced into the printing device guideway is at the conclusion of the fourth conditioning operation, located at the transfer station IV—T. The machine is then in condition for performance of the first printing operation, it being noted that in the course of such operation of the machine the printing device in station IV—T is advanced to station V or printing position during the first half of the machine cycle so that a printing operation may be performed therefrom during the last half of such cycle. Hence, after the operator has depressed the foot pedal 120 four times and has thereby conditioned the machine for its first printing operation, a sheet or form is placed in position on the table top over the printing opening 166 in the ribbon guard 165, such positioning being facilitated by proper adjustment of the side guides along the mounting bar 168 and by proper positioning of the rear guide.

Before performing the first printing operation, the operator normally verifies the positioning or setting of the automatic control means governed by the plunger 970, and if the operator desires to perform the printing operations in a normal or "consecutive" manner so that but a single impression is made from each of the successive printing devices, the plunger 970 is located in its innermost or most rearward position, in which setting an actuation of the foot pedal 122 will in each instance produce operation of the printing device advancing means as well as the platen mechanism P. Thus but one printing operation will be performed from each printing device D.

After verifying the setting of the control plunger 970, the operator depresses the foot pedal 122, and by this action the rock shaft 855 is rocked in such a manner as to tend to actuate the two clutch control lever arms 854 and 864. It will be observed that in the foregoing description of the operation, placement or mounting of the drawer K in the drawer holder 750 has not been described, and if an operator has in fact failed to place the drawer in position to receive the printing devices from the final guideway, the safety interlocking mechanism is effective. Hence, the locking dog 1000 is in its active or elevated position and acts to disable the printing device advancing means so that the first conditioning actuation of the foot pedal 120 as hereinabove described would not cause operation of the machine through the desired conditioning or advancing cycle. The operator is thus warned that further conditioning of the machine is necessary, and the drawer K is then placed in its proper position. In such mounting of the drawer K, the slide follower 389' is placed in an unlocked or freely shiftable relation adjacent to the forward end of the drawer, and after placing the drawer in position on the carrier 750, the drawer holder or carrier is raised at its forward end to the position shown in Fig. 36, in which position the carrier 750 is latched by the latch bar 754. As an incident to the upward movement of the forward end of the carrier 750, the guide members 765 are elevated through appropriate openings in the bottom of the drawer so as to project into the drawer and cooperate with the packer mechanism in assuring proper operation of the printing devices.

Having thus corrected the improper or undesired condition of the machine, the operator may again actuate the foot pedal 120 to perform the four conditioning cycles, after which the foot pedal 122 may be actuated so that the arms 872 and 873 on the rock shaft 855 engage and actuate the lever arms 854 and 864. These lever arms act through the connecting rods 856 and 866 to impart releasing movement to the stop levers 270' and 270'' of the clutches 251 and 252, and in such movement, one of these stop

levers acts through the lever arm 886 or 887 to shift the stop lever 270 of the master clutch 250 to its released position. Thus the clutch pawl of the master clutch 250 is immediately released so that immediate engagement of the master clutch is initiated. The clutch stop levers 270' and 270'' are, however, maintained in their released positions by means of the latches 900 and 901 until such time as rotation of the shaft 200 causes engagement of the clutches 251 and 252 with the resulting rotative movement of the driven members thereof. In the course of the rotative movement of the driven member of the clutch 250, the pin 258a on the driven member of the clutch 250 engages the unlatching lever 907 which rocks the latch shaft 902 and releases the latches 900 and 901 so that the clutch stop levers 270' and 270'' may return toward their normal active positions and be thereby conditioned to terminate the rotation of the driven members of these clutches at the end of the desired one-revolution cycle.

As the driven member of the clutch 252 rotates through its cycle, it drives the eccentric 290 which through its bearing and connecting rod 295 rocks the shaft 296 of the platen actuating mechanism through an operative movement. In such rocking movement of the shaft 296, the link and lever system which connects the shaft 296 to the shaft 298', causes rocking movement of the lever 299 which is fixed on the shaft 298' rearwardly of the platen carriage C, and since this lever 299 is operatively connected to the carriage C, the platen mechanism is operated, first, through its forward or idling stroke during which the platen roller is lowered to its operative position, and then through its active or rearward stroke during which the platen roller is rolled rearwardly across the sheet to produce a printing impression from the printing device at printing station onto the sheet.

Concurrently with the operation of the clutch 252 to drive the platen mechanism through its printing cycle, the clutch 251 drives its eccentric 272 and through the connecting rod 274 and the lever 450, imparts rocking movement to the shaft 451 which constitutes a portion of the drive for the printing device advancing means. Since the lever 450 is also connected at its upper end to the carrier bars 651 and 652 of the final printing device guideway, it will be observed that the rocking movement of the shaft 451 serves to actuate all of the elements of the printing device advancing means. The actuation of the carrier bars 401 and 402 of the initial printing device guideway is effected through the medium of the lever arm 460 which is fixed on the right-hand end of the shaft 451, while a connection between the lever arm 460 and a lever system located immediately forwardly of the transfer station II—T, imparts reciprocating movement to the carrier bars 481 and 482 of the intermediate guideway in timed relation to reciprocating movement of the carrier bars of the initial and final guideways. The relationship of the several members of the lever system is such that when the carrier bars of the initial and final printing device guideways are being moved forwardly through their active strokes, the printing device advancing means of the intermediate guideway is being moved to the right or through its preliminary or conditioning stroke. Thus when the printing device advancing means of the initial and final guideways have completed their forward or advancing strokes and are being moved through their retracting or rearward strokes, the printing device advancing means of the intermediate guideway is being moved to its active or left-hand stroke during the course of which the printing devices located in the intermediate guideway are advanced to the left from one station to another.

In Figs. 43 to 46, inclusive, the printing device guideways are illustrated with the various retaining strips and other covering means removed so that the advancing means are clearly shown in a series of positions which they assume in the course of a printing device advancing movement, and the printing devices in this series of views are illustrated in the arrangement or positioning which they assume in the second printing operation which is performed with the machine. In other words, the printing device which was first withdrawn from the magazine M is illustrated in Fig. 43 in its at rest position at the printing station V, which position it has assumed during the course of the first actual printing operation performed with the machine. Thus, for purposes of identification, the first printing device which was withdrawn from the magazine M has been indicated as D—1 and is located at printing position, the second printing device which was withdrawn from the magazine M is indicated as D—2 and is located at the transfer station IV—T, the third printing device is indicated as D—3 and is located at station IV in the intermediate guideway, the fourth printing device withdrawn from the magazine is indicated as D—4 and is located at station III, while the fifth printing device withdrawn from the magazine is indicated as D—5 and is located at the sensing station or station II. Another printing device is also shown in Fig. 43 as D—6 and is located in the magazine M or, in other words, at station I. The various elements of the mechanism are illustrated in Fig 43 in the positions which they assume at the end of a cycle of operation of the machine, and it will be observed that the positioning pawls 422 and 690 are engaged respectively with the notches in the ends of the printing devices D—5 and D—1. It will also be observed that the shoulders 412 formed on the carrier bars 401 and 402 are located just rearwardly of the printing device D—6 so that the printing device is resting upon the surfaces 413 of the carrier bars 401 and 402. Thus it will be seen that in the next forward movement of the carrier bars 401 and 402, the shoulders 412 will move into engagement with the rear ends of the spacing flanges 118 of the printing device D—6 so as to advance the printing device D—6 forwardly out of the magazine M and toward station II or sensing station. It will also be observed in Fig. 43 that the pawls 430 are located a substantial distance rearwardly of the printing device D—5 which is at station II so as to be conditioned for operative engagement with the printing device D—5 in the next advancing movement of the carrier bars 401 and 402.

In the intermediate guideway the carrier bars 481 and 482 are illustrated in Fig. 43 as being at the end of their left-hand or advancing strokes so that the actuating pawls 495 are shown in their operative engagement with the trailing edge or right-hand end edge of the printing device D—4 at station III, and this printing device has been moved to the left in the preceding machine cycle in an amount sufficient to permit the retaining pawl 530 to be engaged with the rear or trailing end edge thereof. The actuating pawls 495 and the retaining pawl 535 are similarly engaged with

the rear or trailing end edge of the printing device D—3 at station III. The actuating pawls 497 are shown in engagement with the trailing end edge of the printing device D—2 at station IV—T, and the retaining pawls 540 are shown with their ends relatively close to this trailing end edge of the printing device D—2 but slightly spaced therefrom in order to insure free forward movement of the printing device D—2 in the next advancing movement of the printing device advancing means.

In the final printing device guideway, as illustrated in Fig. 43, the actuating pawls 660 are illustrated as being spaced somewhat rearwardly of the rear edge of the printing device D—2 at the transfer station IV—T, while the actuating pawls 661 are illustrated as being spaced a considerable distance rearwardly of the printing device D—1 which is located at the printing station or station V.

When the printing device advancing means starts through the first half of its stroke, the carrier bars 401 and 402 of the initial printing device guideway and the carrier bars 651 and 652 of the final printing device guideway are moved into a forward direction toward the positions shown in Fig. 44 of the drawings, and while the pawls 430 are approaching the rear edge of the printing device D—5 and the pawls 661 are approaching the rear edge of the printing device D—1, the positioning pawls 422 and 690 are actuated by their cam 804 so as to withdraw the positioning teeth and the stop lugs thereof to the withdrawn positions shown in Fig. 44. This actuation of the positioning pawls 422 and 690 clears the path of the printing devices D—5 and D—1 so that when the pawls 430 and 661 come into engagement respectively with the printing devices D—5 and D—1, these printing devices may be advanced along the respective guideways in which they are positioned. In the course of such forward movement from the relationship shown in Fig. 43 to the relationship shown in Fig. 44, the shoulders 412 move into engagement with the rear edge of the printing device D—6 so as to advance the same from the bottom of the hopper and forwardly along the initial guideway toward the sensing station or station II, the printing device D—5 having been advanced at this same time for a short distance in a forward direction from its previous position at sensing station.

In the final printing device guideway, these carrier bars 651 and 652 have during this time advanced so that the pawls 660 have engaged the rear edge of the printing device D—2 and have advanced the same for a short distance forwardly from the transfer position IV—T toward the printing station or station V. In this connection it will be observed that the pawls 497 are withdrawn from their contact with the right-hand end edge of the printing device D—2 before the advancing movement of the printing device D—2 is initiated, and free advancing movement of the printing device D—2 from the transfer station IV—T is therefore assured. The pawls 661 have during this advancing movement of the carrier bars 651 and 652 engaged the rear edge of the printing device D—1 at printing position, such engagement having taken place somewhat after the engagement of the pawls 660 with the printing device D—2.

While the printing devices in the initial and final printing device guideways have been thus advanced partially toward the succeeding stations of the guideways, the carrier bars 481 and 482 of the intermediate guideway have started upon their right-hand or conditioning movement as will be evident from a comparison of Figs. 43 and 44. As such right-hand movement of the carrier bars 481 and 482 progresses, the sloping upper edges of the pawls 497 and 496 move respectively into engagement with the left-hand edges of the printing devices D—3 and D—4 so that these sets of pawls are cammed downwardly and pass freely beneath the two printing devices. In the course of such downward camming action of the pawls 497 and 496, the two printing devices D—3 and D—4 are held against retrograde movement by the engagement therewith of the retaining pawls 535 and 530. In the present machine the pawl 495 which is mounted on the carrier bar 481 remains in its upper or active position at all times, while the pawl 495 which is mounted on the carrier bar 482 remains in its uppermost position only until it has passed to the right for about one-half the length of the transfer station II—T, at which time the pin 560 on this pawl 495 engages the guide strip 561 and is cammed downwardly so as to withdraw the associated pawl 495 and clear the transfer station II—T for the entry of the printing device D—5 which is at this time being advanced toward the printing station, as shown in Fig. 44. The pawl 495 on the carrier bar 482 is maintained in its downward or retracted position until such time as it has passed the right-hand end of the transfer station II—T and it then passes beyond the end of the guide strip 561 and springs upwardly so that in the return or left-hand movement of the carrier bar 482 this pawl 495 will be in its upper or active position.

The forward movement of the printing device advancing means of the initial and final guideways then progresses from the relationship shown in Fig. 44 to the end of the first half of the operating stroke or cycle which is shown in Fig. 45 of the drawings, and it will be observed that after the rear edge of the printing device D—5 has passed the stop lug of the positioning pawl 422, this positioning pawl is allowed to move to the right for a distance sufficient to position the end of the stop lug in the path of the rapidly advancing printing device D—6. A similar actuation of the positioning pawl 690 also serves to project the stop lug thereof into the final guideway after the rear edge of the printing device D—1 has advanced beyond the position of the stop lug of the positioning pawl 690. Thus the rapidly advancing printing device D—2 may move into contact with the stop lug of the positioning pawl 690; and the stop lugs of the positioning pawls 422 and 690, therefore, serve to impart a preliminary positioning to the printing devices as they are moved into the printing position and into sensing station.

It will be observed that in the terminal portion of the forward advancing movement of the carrier bars 651 and 652, the printing device D—1 is discharged forwardly to station VI or it passes downwardly through the guideway 720 so as to be filed in the drawer K by the packer mechanism.

After the printing devices D—6 and D—2 have been fully advanced respectively to sensing station and printing station, a final positioning action is exerted on these two printing devices by the positioning pawls 422 and 690 which at this point in the cycle are released by the action of

the receding surface 838 on their control cam so as to allow the positioning teeth thereof to be urged yieldingly into the notches in the ends of the printing devices. Thus the printing devices D—6 and D—2 located at sensing station and printing position respectively are held by the positioning pawls 422 and 690 respectively against retrograde movement when the associated carrier bars are withdrawn rearwardly in their return strokes.

With respect to the printing device D—5, it will be observed that in the course of its advancing movement from the position of Fig. 44 and into the transfer station II—T, the forward end edges of the guide flanges 118 of the printing device have moved into contact with the rearwardly sloping surfaces of the detent pawls 440 so as to move these detent pawls 440 downwardly and out of the path of the advancing printing device D—5 It will be understood, of course, that the requisite downward force upon the detent pawls 440 is made possible by the upward reaction of the upper face of the end edges of the printing device D—5 upon the retaining strips 414 and a portion of the retaining plate 552. As the forward ends of the spacing flanges 118 advance beyond the retracted pawls 440, these spacing flanges move onto the supporting plate 525 so that the printing device D—5 is supported on the plate 525 as it moves progressively into the transfer station II—T. When the movement of the printing device D—5 in an upward direction into the transfer station II—T has been completed, the two detent pawls 440 return to their upper positions wherein their forward edges engage the rear ends of the spacing flanges 118 to form a continuation of a guiding surfaces of the intermediate guideway. The forward edge of the plate 550 also cooperates with the forward edges of the pawls 440 in providing the desired guiding surfaces for insuring proper positioning of the printing device D—5 in the subsequent advancing movement to the left along the intermediate guideway.

It will be observed that during the forward advancing movement of the carrier bars 651 and 652, as hereinabove described, the printing device D—2 has been advanced out of the transfer station IV—T, so that when the forward advancing movement of the carrier bars 651 and 652 has been completed, the transfer station IV—T is unoccupied and is in condition to receive the printing device D—3 in the advancing or left-hand movement of the carrier bars 481 and 482 which will now be described in detail.

When the parts of the printing device advancing means are in the position shown in Fig. 45, the printing device advancing cycle is at its mid-point, and the actuating pawls 495, 496 and 497 are located somewhat to the right of the printing devices D—5, D—4 and D—3, respectively, and are in their upper or active positions so as to be conditioned for imparting advancing movement to these printing devices. Thus when the carrier bars 481 and 482 are advanced to the left from the positions shown in Fig. 45 to the positions shown in Fig. 46, the printing devices D—5, D—4 and D—3 are engaged by the actuating pawls 495, 496 and 497, respectively, and are moved in a left-hand direction. In such movement the left-hand or forward end edge of the printing device D—5 moves into engagement with the sloping upper surface of the detent pawl 530 while the printing devices D—4 and D—3 exert a similar action upon the detent pawls 535 and 540, respectively. As the left-hand movement of the carrier bars 481 and 482 progresses to the left from the positions shown in Fig. 46 to the positions shown in Fig. 43, the printing device D—5 is advanced to station III and the detent pawl 530 returns to its upper or active position so as to hold this printing device D—5 into position at station III. The printing device D—4 is concurrently advanced to station IV and the retaining pawl 535 returns to its upper or active position to retain the printing device D—4 at this station. The printing device D—3 is during this same period advanced into the transfer station IV—T and during such movement is supported by engagement of the ends of its spacing flanges with the supporting plate 678. The various elements of the printing device advancing means then come to rest and the machine is conditioned for its succeeding operation. It will be observed in this connection, however, that after the printing device D—2 has reached the position shown in Fig. 45 of the drawings, the platen mechanism P operates through its rearward or printing stroke so that the desired printing operation from the printing device D—2 is performed during the time when the carrier bars 651 and 652 are being returned to their rearward or at rest positions.

Thus in the "consecutive" setting of the present machine, the operator may perform a series of printing operations in which one printed impression is made from each of the printing devices while it is at rest at the printing station. Such consecutive operation of the machine is attained through use or actuation of the foot pedal 122, and after all of the printing devices in the magazine M have been advanced through the machine and have been refiled in the drawer K by the packer mechanism, the drawer K is removed from the drawer carrier 750 and is replaced in the filing cabinet. The machine is then reloaded or resupplied with printing devices as hereinabove described.

It will be understood, of course, that in the operation of a machine of this character in its "consecutive" setting as above described, automatic selector means such as that described in my co-pending application Serial No. 392,151, filed May 6, 1941, may cause certain of the printing devices D to be skipped in response to the presence or absence of control means such as tabs 117 at selected positions along the upper edge of such printing devices. Such "skip" operation of the machine would in such instances take place even though the "consecutive" foot pedal 122 were actuated to initiate the particular cycle of machine operation.

When the machine is being operated in its consecutive adjustment as hereinbefore described, the operator may, through the window W, observe the printing devices when they are located at station IV and may visually select certain of such printing devices for either "skip" or "repeat" operations of the machine. If the operator wishes to skip a particular one of the printing devices, the foot pedal 122 is operated to initiate the cycle of operation which is started when the selected printing device is in position beneath the window W. Thus, a printing operation is performed from the printing device which is in such operation advanced from the transfer station IV—T to the printing station V. Hence, the selected printing device is during this intermediate operation, advanced to the transfer station IV—T and is in such a position that in the next operation of the machine, this selected

printing device will be advanced to printing position. In this next operation of the machine, therefore, the operator actuates the skip pedal 120 so that when the selected printing device is advanced to printing position, the platen mechanism PF will remain inactive so as to avoid printing from the selected printing device. If the operator desires to perform a printing operation from the next printing device, the foot pedal 122 is actuated in the usual manner.

In the event that the operator has through the window W selected a particular printing device for "repeat" operation of the machine, this selected printing device is advanced to printing position in the usual manner through the use of the consecutive foot pedal 122. In such advancing movement the first actuation of the pedal 122 advances the selected printing device to the station IV—T, and the next actuation of the pedal 122 advances the selected printing device to printing station and causes a first printing operation to be performed from the selected printing device. For each additional printing impression which is to be made from the selected printing device, the "repeat" foot pedal 121 is actuated. As soon as the required number of printing impressions have been made from the selected printing device, the foot pedal 122 is actuated to advance another printing device to the printing station. When the foot pedal 122 is thus used to advance the next printing device to the printing station, a printing impression is made from such newly advanced printing device. In the event that the succeeding printing device is one which the operator desires to skip, the "skip" pedal 120 is employed to initiate the next cycle of the operation of the machine.

As hereinbefore mentioned, some operators of machines of this character prefer to use the foot pedal 122 when a large number of "repeat" printing operations are being performed, and in such instances the present machine may be readily adjusted to meet the preference of the operator. Thus after a particular printing device has been moved to printing position, the machine may be so adjusted by means of the control plunger 970 that succeeding actuations of the foot pedal 122 serve merely to initiate operation of the platen mechanism P while allowing the printing device advancing means to remain inactive. Such adjustment is effected by withdrawing the plunger 970 to its outermost or "repeat" position as illustrated in Figs. 67 and 68, and in this position of adjustment the stop lever 920 is maintained continually in its active position of Fig. 67 so as to prevent engagement of the printing device advancing clutch 251. When the operator employs the automatic control means governed by the plunger 970 to attain "repeat" operation of the machine, the replacement of the printing device at printing position by another printing device may be readily accomplished through the manipulation of the conveniently accessible plunger 970. Thus after the operator has made the desired number of printing impressions from a particular printing device in printing position, the control plunger 970 is shifted rearwardly to its innermost or "consecutive" position so that the machine is again adjusted for consecutive operation. The operator may then depress the consecutive foot pedal 122, and in the course of the machine operation which is thus instituted, the printing device advancing means is operated through a feeding cycle so as to advance the next printing device from the station IV—T to printing position.

The machine is adjusted to its "multi-print" setting through actuation of the control plunger 970 to its intermediate position shown in Fig. 62, and it will be noted that in most instances when such an adjustment of the control plunger is to be made, the cam roller 936 will be located in one of the recesses 948 of the cam 937. This normal positioning of the control assembly is in the present instance attained by reason of the fact that the cam assembly is not actuated by the link 951 except when the machine is adjusted for multi-print operation, and since the safety latch 990 prevents the plunger 970 from being moved from its multi-print setting of Fig. 62 except when the cam roller 936 is in engagement with a recess 948, the construction is such that the plunger 970 will never be actuated from one position to another except when the pin 984 is in its lower position. If, however, the pin 984 is in its elevated position, by reason of the alignment of one of the high points of the cam with the roller 936, the sloping forward end of the latch member 990 may be engaged with the pin 984 to cam the safety latch upwardly over the pin.

When the machine is thus set for "multi-print" operation, through the adjustment of the plunger 970 to the position shown in Fig. 62, the four conditioning operations of the machine must be performed every time the magazine is loaded, and such conditioning operations are performed by depression of the skip lever pedal 120 in the manner hereinbefore described.

It will be observed that although the machine is now set for multi-print operation, the supplemental stop lever 920 of the printing device advancing clutch 251 is in its retracted or inactive position so that when the skip pedal 120 is actuated, the normal stop lever 270' of the printing device advancing clutch will release the clutch for operation through a normal cycle. Since only the clutch 251 is released when the skip pedal 120 is actuated, it will be clear that the platen mechanism will not be operated and hence the control assembly 940 and its cam 937 will remain in its initial position until the desired number of conditioning operations have been performed. Thus when the four conditioning operations have been performed through actuation of the skip pedal 120, the machine is in condition for performance of the successive multi-print operations. The operator will, therefore, employ the foot pedal 122 to initiate the next cycle of operation and in this cycle the printing device advancing means will advance the first printing device from the station IV—T into printing station and the platen mechanism will operate through its normal cycle to produce a printing impression from the printing device which has just been advanced to printing position. In the course of such operation, the platen actuating mechanism operates upon the link 951 to move the same through a reciprocating stroke during which the ratchet wheel 942 is engaged and advanced through one angular increment of its movement. This increment of movement is in the present instance sufficient to move the succeeding high point 946 of the cam 937 into alignment with the cam roller 936 and the cam roller is therefore elevated so as to rock the control frame 921 in a counterclockwise direction.

Such movement of the control frame shifts the supplemental stop lever 920 to its active position of Fig. 63 so that when the control pedal 122 is

again actuated, the printing device advancing clutch **951** will be maintained disengaged despite the fact that its normal stop lever **270'** is withdrawn to its inactive or releasing position. A second printing operation is therefore performed from the printing device at printing position. In the course of this second printing operation the control assembly **940** is again advanced through the operation of the actuating link **951**, and in the form of the control assembly herein shown this actuation of the control assembly causes a recess **948** of the cam to be moved into alignment with the cam roller **936**. The supplemental stop lever **920** is therefore allowed to rock to its inactive position of Fig. 62 so that in the next actuation of the control pedal **122** the printing device advancing means will be allowed to operate and thereby feed the succeeding printing device to printing position.

Thus the automatic control means which is governed or set up by the control plunger **970** may be employed to produce any reasonable number of printing impressions from each of the printing devices, in accordance with the form and construction of the control assembly **940**. When the machine is being used in its multi-print adjustment as hereinabove described, the control plunger **970** may as occasion requires be manipulated to its repeat position of Fig. 67 in substantially the same manner as has been hereinbefore described, so that a greater number of printing impressions may be made from selected printing devices.

Such adjustment of the control plunger **970** to attain repeat operation as to a selected printing device must be made, of course, at the end of the predetermined number of machine cycles which is determined by the form of the control cam assembly **940**, this restriction being imposed by reason of the automatic safety action of the latch **990**. Thus, after the desired number of repeat printing operations have been performed from the selected printing device, the control plunger **970** may be again returned to its multi-print adjustment of Fig. 62. It will be observed in this connection that while the control plunger has been in its repeat setting, the actuating link **951** has been in effect disabled through the action of the shoulder **983'**. Hence, when the control plunger is returned to its multi-print adjustment, the cam roller **936** will be in one of the recesses **948** of the cam, and the machine will automatically function to produce the desired number of printing operations from the next printing device.

When the machine is adjusted for multi-print operation, the usual or normal skip operation of the machine may be attained in the usual manner by actuation of the skip pedal **120**. Such actuation of the skip pedal **120** would, of course, be made after the last one of the desired impressions had been made from a particular printing device, and an operator would normally know when this desired number of printing operations had been performed. In the event, however, that the operator had miscounted the number of impressions made from the printing device at printing position, and has endeavored prematurely to produce a skip operation of the machine, the automatic functioning of the machine would be such as to warn the operator that the desired number of printing operations from the particular printing device had not been completed. Such a warning would be given by the fact that upon depression of the skip pedal **120**, the clutch **251** would not be allowed to engage by reason of the location of the supplemental stop arm **920** in its active position. Such active positioning of the supplemental stop lever **920** would necessarily follow from the fact that at this time in the operation of the machine the cam roller **936** would be engaged with a high point on the cam **937**. It would, therefore, be necessary for the operator to perform one or more additional printing operations from the printing device at printing station so that the control assembly **940** would be advanced to bring a recess of the cam **937** into alignment with the cam roller **936**. The supplemental stop lever **920** would then be withdrawn from its active position, and the stop lever **270'** would thereafter constitute the sole control for the clutch **251** of the printing device advancing means. The skip foot pedal **120** could then be actuated so as to cause engagement of the clutch **251** and the consequent operation of the printing device advancing means through an advancing cycle. In the course of such advancing movement, the platen clutch **252** would remain disengaged so that a skip operation would result.

Since the platen mechanism remains inactive in such a skip operation of the machine, it will be evident that the control assembly **940** also remains inactive and the controlling operation thereof is not disturbed.

Summary

From the foregoing description it will be evident that the present invention enables a printing machine, through which a series of printing devices are passed in succession from a magazine, to perform printing operations upon relatively large or wide sheets, and that such sheets may be considerably larger than the sheets accommodated by prior machines of this general type. It will be evident that this desirable result is rendered possible through the novel printing device advancing means of the present invention which enables the magazine to be located in a remote or out-of-the-way position so as to provide the desired clear space on the table top of the machine while at the same time facilitating the loading of the magazine.

It will also be apparent that the present invention insures proper refiling of the printing devices after they are passed through the machine, this result being attained by the novel interrelationship of the printing device collecting means and the printing device advancing means which prevents advancing of printing devices when the drawer or collector is not properly positioned to receive the printing devices discharged from the printing device guideway. The printing machine of the present invention is such that the operating mechanism may be controlled easily and conveniently by an operator seated in front of the machine, and the control mechanism as well as the actuating mechanism of the machine is so constructed and arranged that they may be enclosed or housed within the frame of the machine, thereby to be concealed and protected by the elements of the frame. By reason of this construction the present machine has a neat and pleasing appearance which has heretofore been unattainable in machines of this general character.

The printing machine disclosed herein is such that it may be readily used as a relatively simple basic machine which may be marketed at a reasonable price, and yet this basic machine is capable of modification in a relatively simple manner so as to incorporate many additional features

of convenience or of automatic operation. Thus the novel path of movement of the printing devices from the magazine to printing position enables simple and inexpensive visual methods of selection to be employed. Such visual selection is readily performed in the present machine by reason of the fact that the inspection window W may be located at one side of the printing position so that the operator may, while seated in normal position in front of the machine, always have the inspection window within a normal line of sight as contrasted with the prior location of such a window directly back of the printing position and the platen mechanism.

The novel printing device advancing path which is provided by the present invention has a far reaching effect in attaining convenience of location and operation of the various elements of the machine. For example, the printing device path of the present invention enables the magazine to be located near one of the rear corners of the machine so that the printing devices are advanced forwardly from the hopper toward or beneath a clear and unobstructed portion of the table top of the machine. This constitutes the initial path of the printing devices and when the novel printing device path of the present invention is employed, the selecting mechanism may be located immediately forwardly of the magazine and along this initial path, in which position the selecting means is readily accessible for inspection or setting by the operator. This accessible location of the selecting mechanism has not been attainable in prior machines of this general character.

The novel printing device path incoporated in the present machine also enables the printing frame or supporting means for the platen mechanism to be located at an angle with respect to the front and forward edge of the machine and enables full or maximum utility to be realized from this angular position of the printing frame. Thus the printing device path of the present machine enables the magazine to be located rearwardly of the forward edge of the vertical portion of the printing frame so that the entire surface of the table top is clear and unobstructed forwardly of the vertical portion of the printing frame and from end to end of the table top. Moreover, this construction results in the provision of a clear space extending from front to rear of the machine and for a considerable distance laterally with respect to the printing position. Hence, relatively wide sheets may be employed in the printing operations performed with the present machine and may in most instances be fed in a flat form from front to rear of the machine. This capability is of particular importance when listing operations are being performed on relatively long and wide sheets, and the present machine is such that a listing device for facilitating such listing operations may be readily mounted along the clear rear portion or edge of the table top of the machine.

It will be evident therefore that the present invention materially extends the range or field of usefulness of printing machines of this general character.

While I have illustrated and described a selected embodiment of my invention, it is to be understood that this is 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 having a table top with an opening therein defining a printing position, an arm extended upwardly from said table top at a position spaced both laterally and longitudinally from said printing position and extended angularly across and in spaced relation with respect to said table top to dispose said arm over printing position and thereby afford a deep throat in a lateral direction for passage of relatively wide sheets longitudinally beneath said arm and to afford a deep throat in a longitudinal direction for passage of relatively wide sheets laterally beneath said arm, a printing device guideway extended through said printing position and through which printing devices may be advanced to have impressions made therefrom when disposed at printing position, a magazine into which printing devices may be introduced to be withdrawn therefrom to be passed through said guideway, means supporting said magazine out of lateral and longitudinal alignment with said printing position, and impression means of which at least a part is carried by said arm and operable to make impressions from printing devices disposed at printing position.

2. In a printing machine having a table top with an opening therein defining a printing position, an arm extended upwardly from said table top at a position spaced both laterally and longitudinally from said printing position and extended angularly across and in spaced relation with respect to said table top to dispose said arm over printing position and thereby afford a deep throat in a lateral direction for passage of relatively wide sheets longitudinally beneath said arm and to afford a deep throat in a longitudinal direction for passage of relatively wide sheets laterally beneath said arm, a printing device guideway extended through said printing position and through which printing devices may be advanced to have impressions made therefrom when disposed at printing position, a magazine into which printing devices may be introduced to be withdrawn therefrom to be passed through said guideway, said magazine extending above said table top out of lateral and longitudinal alignment with said printing position, and impression means of which at least a part is carried by said arm and operable to make impressions from printing devices disposed at printing position.

3. In a printing machine having a table top with an opening therein defining a printing position, an arm including a portion extended upwardly from said table top at a position spaced both laterally and longitudinally from said printing position and another portion extended angularly across and in spaced relation with respect to said table top to dispose said arm over printing position and thereby afford a deep throat in a lateral direction for passage of relatively wide sheets longitudinally beneath said arm and to afford a deep throat in a longitudinal direction for passage of relatively wide sheets laterally beneath said arm, cooperating impression means mounted in part beneath said opening and in part on said arm, a supply magazine for containing printing devices and disposed adjacent to said upwardly extending portion of said arm, and printing device advancing means including a printing device guideway extended from said

magazine and through printing position and along which guideway printing devices may be advanced into and from printing position.

4. In a printing machine having a table top with an opening therein defining a printing position, an arm extended upwardly from said table top at a position spaced both laterally and longitudinally from said printing position and extended angularly across and in spaced relation with respect to said table top to dispose said arm over printing position and thereby afford a deep throat in a lateral direction for passage of relatively wide sheets longitudinally beneath said arm and to afford a deep throat in a longitudinal direction for passage of relatively wide sheets laterally beneath said arm, cooperating impression means mounted in part beneath said opening and in part on said arm, a supply magazine for containing printing devices and disposed adjacent to said upwardly extending portion of said arm and out of the paths of movement of sheets passed longitudinally or laterally beneath said arm, and printing device advancing means including a printing device guideway extended beneath said table top from said magazine and through printing position and along which guideway printing devices may be advanced into and then out of printing position.

5. In a printing machine having a table top upon which a sheet to be imprinted may be disposed and having an opening in said table top defining a printing position located adjacent a forward portion of said table top, a platen arm extending upwardly from said table top at a point located rearwardly and a substantial distance laterally from said printing station and then extending angularly across and in spaced relation to said table top to overlie said printing position, cooperating impression means mounted in part beneath said opening and in part on said arm over printing position, a printing device guideway extended through printing position and through which printing devices may be advanced to have impressions made therefrom when disposed at printing position, a magazine into which printing devices may be introduced to be withdrawn therefrom to be passed through said guideway, and means supporting said magazine out of lateral and longitudinal alignment with said printing position.

6. In a printing machine having a table top upon which a sheet to be imprinted may be disposed and having an opening in said table top defining a printing position located adjacent a forward portion of said table top, a platen arm including a portion extending upwardly from said table top at a point located rearwardly and a substantial distance laterally from said printing station and another portion extending angularly across and in spaced relation to said table top to overlie said printing position, cooperating impression means mounted in part beneath said opening and in part on said arm over printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, and printing device advancing means located beneath said table top and operable to advance printing devices from said magazine and into said printing position.

7. In a printing machine, a frame providing a table top upon which a sheet may be positioned, said table top having an opening therein defining a printing position located adjacent a forward portion of said table top, a printing arm extending upwardly from said table top adjacent a rear corner thereof and then extending angularly across and in spaced relation to said table top to overlie said printing position, cooperating impression means mounted in part beneath said opening and in part on said arm over printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, sensing means located at and serving to define a sensing position located forwardly of said magazine and rearwardly of the most forward portion of said upwardly extending portion of the printing arm, printing device advancing means operable to advance printing devices forwardly from said magazine to said sensing position, and advancing means disposed beneath said table top operable to advance printing devices forwardly from said sensing position and to thereafter advance each printing device to said printing position.

8. In a printing machine of the character described through which a plurality of printing devices are advanced one by one, a frame providing spaced front and rear mounting bars, means providing an initial printing device guideway comprising a first girder and extending between said front and rear mounting bars and a second girder extending in parallel spaced relation to said first girder from said rear mounting bar forwardly throughout a substantial portion of the distance between said mounting bars, a final printing device guideway comprising a third girder mounted on and extending between said front and rear mounting bars and spaced a considerable distance laterally from said first and second girders, and a fourth girder forming a part of the said final printing device guideway and extending from said front mounting bars in a rearward direction and throughout a substantial portion of the distance between said mounting bars, and an intermediate printing device guideway extending between said initial and said final printing device guideways and comprising a fifth girder and a sixth girder spaced laterally with relation to each other and extending between said first girder and said third girder at right angles thereto and supported by said first girder and third girder, and means connecting the forward end of said second girder to said fifth girder so as to support said forward end.

9. In a printing machine through which printing devices are advanced one by one, a frame providing spaced front and rear mounting bars, a girder system carried by said front and rear mounting bars and providing an initial printing device guideway extending forwardly from the rear portion of the machine, and also providing intermediate and final printing device guideways, said intermediate guideway intersecting with a forward portion of said initial guideway and extending substantially parallel to said mounting bars, and said final printing device guideway extending in a direction perpendicular to said mounting bars and intersecting with said intermediate guideway, a supply magazine mounted at a rear portion of said initial guideway, impression means disposed along said final guideway and including an anvil in said final guideway forwardly of said intermediate guideway, and means for advancing printing devices one by one through said initial guideway, said intermediate guideway and said final guideway in succession, said means in said initial guideway comprising carrier bars adapted to both support and

advance the printing devices in one portion of said initial guideway, and means in the other portion of said initial guideway operable to support the printing devces in said other portion as they are advanced by said carrier bars.

10. In a printing machine having a table top upon which sheets may be positioned to have printed impressions made thereon, said machine being adapted to employ printing devices of substantially rectangular form and having side edges and end edges, and said machine having impression means defining a printing position in said table top and having a supply magazine adapted to contain a supply of such printing devices, said magazine being a substantial distance from said printing position in an acute angular direction with respect to said side and end edges, a printing arm extended upwardly from said table top remote from said printing position and then extended in spaced relation to said table top in an acute angular direction with respect to said side edges to dispose the ends of said arm over said printing position, a part of said impression means being supported on said end of said arm over printing position, means providing an initial printing device guideway extending beneath said table top from said magazine in such a direction that printing devices may be advanced one by one from said magazine along said initial guideway with a selected one of said edges of the printing devices parallel to said initial guideway, means providing an intermediate guideway disposed beneath said table top and intersecting with said initial guideway at the first transfer station, said intermediate guideway being formed to provide for advancing movement of the printing devices along said intermediate guideway with said selected one of said edges of said printing devices at right angles to said intermediate guideway, said intermediate guideway also being formed to support and guide such printing devices by engagement with upper and lower surfaces thereof adjacent to the side edges of the printing device, means providing a final printing device guideway disposed beneath said table top and extending along a path which includes said printing position and along which said printing devices are adapted to be advanced with said selected edges parallel to the final path, and means in all of said guideways operable to advance printing devices along said guideways from said magazine to and through said printing position.

11. In a printing machine in which substantially rectangular printing devices having spacing flanges along their opposite edges and projecting from the reverse face of the printing devices are adapted to be advanced one by one through the machine, means providing first and second printing device guidways disposed substantially at right angles to each other so as to intersect in a transfer station and along which guideways each printing device is advanced in succession with the spacing flanges of the printing devices parallel to said first guideway and substantially perpendicular to said second guideway, printing device feeding means operatively associated with each of said guideways, and a pair of depressible members in said first guideway located in the paths of the spacing flanges of a printing device being advanced therethrough into said transfer station and adapted to be depressed by such an advancing printing device and to resume normal elevated positions after the printing device has passed into said transfer station, said depressible members having abutment surfaces thereon operable in said normal elevated positions to prevent retrograde motion of the printing device from said transfer station along said first guideway, and having such abutment surfaces disposed to cooperate with said second guideway in guiding the printing device when the printing device is advanced from said transfer station along said second guideway.

12. In a printing machine in which substantially rectangular printing devices having spacing flanges along their opposite edges and projecting from the reverse face of the printing devices are adapted to be advanced one by one through the machine, means providing first and second printing device guideways disposed substantially at right angles to each other so as to intersect in a transfer station and along which guideways each printing device is advanced in succession with the spacing flanges of the printing devices parallel to said first guideway and substantially perpendicular to said second guideway, printing device feeding means operatively associated with each of said guideways, and a pair of depressible members in said first guideway located in the paths of the spacing flanges of a printing device being advanced therethrough into said transfer station and adapted to be depressed by such an advancing printing device and to resume normal elevated positions after the printing device has passed into said transfer station, said depressible members having abutment surfaces thereon operable in said normal elevated position to prevent retrograde motion of the printing device from said transfer station along said first guideway, and said abutment surfaces being positioned to cooperate with said second guideway in guiding the printing device when the printing device is advanced from said transfer station along said second guideway, and a retaining means arranged to overlie said printing devices and limit upward movement of the printing devices while said depressible members are being forced downwardly, said depressible members having abutment surfaces thereon operable in said normal elevated position to prevent retrograde motion of the printing device from said transfer station along said first guideway, and said abutment surfaces being positioned to cooperate with said second guideway in guiding the printing device when the printing device is advanced from said transfer station along said second guideway.

13. In a printing machine adapted to employ substantially rectangular printing devices having spacing flanges projecting from the reverse face thereof along opposite ends and adapted to bear projecting identifying tabs along one side edge in selected ones of a plurality of identifying positions disposed along said edge of each device, means including an anvil and platen means defining a printing position, a supply magazine, means defining a printing device guideway from said magazine to said printing position, said guideway in at least a portion thereof being arranged for advancing movement of the printing devices therethrough with their spacing flanges extending downwardly and located substantially perpendicular to the guideway, and said guideway in said portion having guide means for engaging the ends of said spacing flanges as well as the lower edges of said flanges to support said printing devices, said guiding means including retaining plates overlying the upper faces of the printing devices and providing clearance space for any tabs which may project from said side edge of any one of the printing devices, advancing means operable to advance printing devices in a step by step manner along said guideway such that each printing device comes to rest at a predetermined position in said portion of said guideway, and said retaining plate which overlies

said tabs having a longitudinal slot formed therein through which a tab on a printing device resting at said position may be seen and its identifying position on the printing device determined.

14. In a printing machine having a supply magazine and a printing position and through which individual printing devices are passed seriatum from said supply magazine and to and through said printing position whereat each printing device comes to rest, impression means at said printing position and producing printed impressions from such printing devices a first printing device guideway originating at said magazine and terminating in a first transfer station, a second printing device guideway originating at said first transfer station and extending at an angle to said first guideway and terminating in a second transfer station located adjacent to said printing station, a third printing device guideway extending from said second transfer station to and through said printing position, first, second and third printing device advancing means operatively associated respectively with said first, second and third printing device guideways and each operable through advancing and retracting strokes, a rock shaft mounted parallel to said second guideway and having actuating arms fixed at its opposite ends, means operatively connecting one of said arms to said first advancing means and the other of said arms to said third advancing means to actuate said first and third advancing means in unison when said shaft is rocked, and a lever system connected between one of said arms and said second advancing means to operate said second advancing means through its advancing stroke when said first and third advancing means are being moved through their retracting strokes.

15. In a printing machine of the character described, means providing a table top upon which a sheet or form may be positioned for the performance of a printing operation thereon, a magazine extending upwardly from said table top for containing a stacked supply of printing devices, said magazine being spaced a substantial distance from the forward edge of the table top and adjacent one end thereof, means providing a printing position on said table top adjacent to the forward edge thereof and spaced laterally along said forward edge a substantial distance from said magazine, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing arm over said printing position, means providing a printing device guideway extending beneath said table top and forwardly from said magazine and providing a first transfer station at the forward end thereof, means providing a second printing device guideway extending from said first transfer station, said second printing device guideway terminating at its other end in a second transfer station located rearwardly of said printing station, means providing a third printing device guideway extending from said second transfer station through and past said printing station and terminating at its forward end in a discharge portion, a printing device collecting means operatively associated with said discharge end portion to receive printing devices discharge therefrom, printing device advancing means mounted in each of said first and third printing device guideways, driving means for reciprocating both of said printing device advancing means through their operative strokes in unison, printing device advancing means operatively associated with said second printing device guideway, and actuating means for said last mentioned printing device advancing means comprising a pair of bell cranks one of which is operatively connected to said driving means to be rocked when said driving means moves through an operating cycle, means operatively connecting said bell cranks for transmission of rocking movement therebetween, and means connecting the other of said bell cranks to said last mentioned advancing means and operable to reciprocate said last mentioned advancing means in such a manner as to advance the printing devices in said second guideway while printing devices in said first and third guideways remain stationary.

16. In a printing machine having a table top with an opening therein defining a printing position and through which machine individual printing devices are passed seriatim to and through said printing position, an arm extended upwardly from said table top at a point remote both laterally and longitudinally from said printing position and extended angularly and in an upwardly spaced relation with respect to said table top to a point overlying said printing position, impression means mounted in part beneath said opening and in part on said arm over said printing position, a printing device magazine located adjacent to the upwardly extending portion of said arm, a first printing device guideway originating at said magazine and terminating in a first transfer station, a second printing device guideway originating at said first transfer station and extending at any angle to said first guideway and terminating in a second transfer station located adjacent to said printing station, a third printing device guideway extending from said second transfer station to and through said printing position, first, second and third printing device advancing means operatively associated respectively with said first, second and third printing device guideways for advancing printing devices therealong, and actuating means for said advancing means arranged to operate said second advancing means through an advancing movement while the printing devices in said first and third guideways are stationary, and to operate said first and third advancing means through advancing movements while the printing devices in said second guideway are stationary.

17. In a printing machine through which printing devices are advanced one by one, a frame affording a table top having an opening therein defining a printing position, an arm extended upwardly from said table top at a point remote both laterally and longitudinally from said printing position and extended angularly and in an upwardly spaced relation with respect to said table top to a point overlying said printing position, impression means mounted in part beneath said opening and in part on said arm over said printing position, a printing device magazine located adjacent to the upwardly extending portion of said arm, and means for guiding advancing printing devices one by one from said magazine to said printing position and including means providing first and second printing device guideways disposed substantially at right angles to each other so as to intersect in a transfer station and along which guideways each

printing device is advanced in succession, reciprocatory printing device advancing means operatively associated with each of said guideways, actuating means operable to reciprocate one of said advancing means along the guideway to which it pertains, a first bell crank having one of its arms operatively connected to the advancing means of the other guideway to actuate the same when said bell crank is rocked, a second bell crank having one of its arms connected by a link to the other arm of said first bell crank, and a link connecting the other arm of said second bell crank to the actuating means of said one of said reciprocating means.

18. In a printing machine through which printing devices are advanced one by one, a frame affording a table top having an opening therein defining a printing position, an arm extended upwardly from said table top at a point remote both laterally and longitudinally from said printing position and extended angularly and in an upwardly spaced relation with respect to said table top to a point overlying said printing position, impression means mounted in part beneath said opening and in part on said arm over said printing position, a printing device magazine located adjacent to the upwardly extending portion of said arm, and means for guiding advancing printing devices one by one from said magazine to said printing position and including means providing first and second printing device guideways disposed substantially at right angles to each other so as to intersect in a transfer station and along which guideways each printing device is advanced in succession, reciprocatory printing device advancing means operatively associated with each of said guideways, actuating means operable to reciprocate one of said advancing means along the guideway to which it pertains, a first bell crank having one of its arms operatively connected to the advancing means of the other guideway to actuate the same when said bell crank is rocked, and a second bell crank having the arm thereof which is adjacent to said first bell crank when the parts are in their at rest positions and which is operatively connected to said actuating means of said one of said reciprocating means, and a link connected at one end to the other arm of said first bell crank and connected at its other end to the other arm of said second bell crank so that said link in the at rest position of said parts extends across said one arm of said second bell crank.

19. In a printing machine of the character described through which a series of printing devices are passed, means providing a table top upon which a sheet may be positioned for the performance of a printing operation, means defining a printing position adjacent the forward edge of said table top, a magazine extending upwardly from said table top for receiving a supply of printing devices, said magazine being located near the rear edge of said table top and adjacent to one end thereof, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing arm over said printing position, advancing means for advancing the lowermost printing device in said magazine forwardly from said magazine beneath said table top to a sensing position, said advancing means being operable in the next succeeding advancing stroke thereof to advance the printing device forwardly to a transfer position, a second advancing means operable to engage the printing device after it has reached said transfer position and to move said printing device along a path located generally parallel to the forward edge of said table top, said path being so located as to extend to a second transfer position rearwardly of said printing position, said second advancing means being constructed and arranged to employ a plurality of advancing strokes or cycles to advance the printing device from said first transfer position to said second transfer position, and a third advancing means operable to engage the printing device in said second transfer position to advance the same forwardly and into printing position, said third advancing means being operable in another advancing stroke to advance a printing device from said printing position to a discharge position, and driving means for said advancing means operable to impart uniformly accelerated and uniformly decelerated motion to said advancing means during the initial and terminal portions respectively of the advancing strokes thereof.

20. In a printing machine of the character described through which a series of printing devices are passed, means providing a table top upon which a sheet may be positioned for the performance of a printing operation, means defining a printing position adjacent the forward edge of said table top, a magazine extending upwardly from said table top for receiving a supply of printing devices, said magazine being located near the rear edge of said table top and adjacent to one end thereof, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing arm over said printing position, advancing means for advancing the lowermost printing device in said magazine forwardly along a first path from said magazine beneath said table top to a transfer position, a second advancing means operable to engage the printing device after it has reached said transfer position and to move said printing device along a second path located generally parallel to the forward edge of said table top, said path being so located as to extend to a second transfer position rearwardly of said printing position, a third advancing means operable to engage the printing device in said second transfer position to advance the same along a third path forwardly and into printing position, and actuating means for said advancing means operable to impart uniformly accelerated and uniformly decelerated motion to said advancing means during the initial and terminal portions respectively of the advancing strokes thereof.

21. In a printing machine of the character described through which a series of printing devices are passed, means providing a table top upon which a sheet may be positioned for the performance of a printing operation thereon, means defining a printing position adjacent the forward edge of said table top, a magazine extending upwardly from said table top for receiving a supply of printing devices, said magazine being located near the rear edge of said table top and adjacent to one end thereof, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing

arm over said printing position, a first printing device guideway along which the lowermost printing device in said magazine may be moved forwardly from said magazine beneath said table top to a sensing position, said first guideway extending forwardly to a transfer position, a second printing device guideway extending from said transfer position and along a path located generally parallel to the forward edge of said table top, said second printing device guideway being so located as to extend to a second transfer position rearwardly of said printing position, a third printing device guideway extending from said second transfer position forwardly to said printing position and forwardly from said printing position to a discharge position, printing device advancing means operatively associated with said guideways, and driving means for said advancing means operable to impart uniformly accelerated and uniformly decelerated motion to said advancing means during the initial and terminal portions respectively of the advancing strokes thereof.

22. In a printing machine of the character described through which a series of printing devices are passed, means providing a table top upon which a sheet may be positioned for the performance of a printing operation, means defining a printing position adjacent the forward edge of said table top, a magazine extending upwardly from said table top for receiving a supply of printing devices, said magazine being located near the rear edge of said table top and adjacent to one end thereof, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing arm over said printing position, a first printing device guideway along which the lowermost printing device in said magazine may be moved forwardly from said magazine beneath said table top to a sensing position, said first guideway extending forwardly to a transfer position, a second printing device guideway extending from said transfer position and along a path located generally parallel to the forward edge of said table top, said second printing device guideway being so located as to extend to a second transfer position rearwardly of said printing position, a third printing device guideway extending from said second transfer position forwardly to said printing position and forwardly from said printing position to a discharge position, first, second and third printing device advancing means operatively associated respectively with said first, second and third guideways, and actuating means operable to move said second advancing means through its return stroke while said first and third advancing means are being moved through their operative advancing strokes.

23. In a printing machine of the character described, means providing a table top upon which a sheet or form may be positioned for the performance of a printing operation thereon, a magazine extending upwardly from said table top for containing a stacked supply of printing devices, said magazine being spaced a substantial distance from the forward edge of the table top and adjacent one end thereof, means providing a printing position on said table top adjacent to the forward edge thereof and spaced laterally along said forward edge a substantial distance from said magazine, a printing arm extended upwardly from said table top adjacent to said magazine and extending in spaced relation to said table top to a point over said printing position impression means carried on said printing arm over said printing position, means providing a printing device guideway extending beneath said table top and forwardly from said magazine and providing a first transfer station at the forward end thereof, means providing a second printing device guideway extending from said first transfer station, said second printing device guideway terminating at its other end in a second transfer station located rearwardly of said printing station, means providing a third printing device guideway extending from said second transfer station through and past said printing station and terminating at its forward end in a discharge portion, a printing device collecting means operatively associated with said discharge end portion to receive printing devices discharged therefrom, printing device advancing means mounted in each of said first and third printing device guideways, means for reciprocating both of said printing device advancing means through their operative strokes in unison, and printing device advancing means operatively associated with said second printing device guideway and actuating means for said last mentioned printing device advancing means operable to reciprocate the same in such a manner as to advance the printing devices in said second guideway while printing devices in said first and third guideways remain stationary.

24. In a printing machine, a frame providing a table top upon which a sheet or form may be positioned, means including an anvil disposed beneath said table top and an opposed platen mechanism defining a printing position located adjacent a forward portion of said table top, means supporting said platen over said anvil including a printing arm extending upwardly from said table top adjacent a rear corner thereof and then extending angularly across and in spaced relation to said table top to overlie said printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, sensing means at a sensing position located forwardly of said magazine, advancing means disposed beneath said table top and operable to advance printing devices forwardly from said magazine to said sensing position and thereafter to advance printing devices forwardly from said sensing position and then laterally into a position rearwardly of said printing position, and advancing means disposed beneath said table top and operable thereafter to advance each printing device to said printing position.

25. In a printing machine, a frame providing a table top upon which a sheet or form may be positioned, means including an anvil disposed beneath said table top and an opposed platen mechanism defining a printing position located adjacent a forward portion of said table top, means supporting said platen over said anvil including a printing arm extending upwardly from said table top adjacent a rear corner thereof and then extending angularly across and in spaced relation to said table top to overlie said printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, sensing means at a sensing position located immediately forwardly of said magazine and rearwardly of the most forward portion of said upwardly extending portion of the printing arm,

advancing means operable to advance printing devices forwardly from said magazine to said sensing position, and advancing means disposed beneath said table top operable to advance printing devices forwardly from said sensing position and then laterally into a position rearwardly of said printing position, and advancing means disposed beneath said table top operable thereafter to advance each printing device to said printing position.

26. In a printing machine, a frame providing a table top upon which a sheet or form may be positioned, means including an anvil mounted beneath said table top and an opposed platen mechanism defining a printing position located adjacent a forward portion of said table top, means supporting said platen over said anvil including a printing arm extending upwardly from said table top adjacent a rear corner thereof and then extending angularly across and in spaced relation to said table top to overlie said printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, advancing means located beneath said table top and operable to advance printing devices forwardly from said magazine and then laterally into a position rearwardly of said printing position, and advancing means located beneath said table top operable thereafter to advance each printing device to said printing position.

27. In a printing machine, a frame providing a table top upon which a sheet or form may be positioned, means including an anvil mounted beneath said table top and an opposed platen mechanism defining a printing position located adjacent a forward portion of said table top, means supporting said platen over said anvil including a printing arm extending upwardly from said table top at a point located rearwardly and a substantial distance laterally from said printing station and then extending angularly across and in spaced relation to said table top to overlie said printing position, a printing device magazine extending upwardly from said table top and located adjacent to said upwardly extending portion of said printing arm, advancing means located beneath said table top and operable to advance printing devices forwardly from said magazine and then laterally into a position rearwardly of said printing position, and advancing means located beneath said table top and operable thereafter to advance each printing device to said printing position.

28. In a printing machine through which a series of printing devices are passed in series, a frame providing a substantially rectangular table top having a forward edge, means defining a printing position adjacent to said forward edge of said table top, platen mechanism and a substantially rigid C-shaped printing frame for supporting the same, said frame having upper and lower arms and a connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position, with said upper arm extending across the table top in an angular relation with respect to said forward edge so as to overlie said printing position and support said platen mechanism over said printing position, and said lower arm extending similarly beneath said table top so that its forward end underlies said printing position, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, means disposed beneath said table top for guiding and advancing printing devices from said magazine to said printing position, and a driving and control unit for said platen mechanism and said advancing means located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame.

29. In a printing machine through which a series of printing devices are passed in series, a frame providing a substantially rectangular table top having a forward edge, means defining a printing position adjacent to said forward edge of said table top, a substantially rigid C-shaped printing frame and a platen mechanism supported thereby, said frame having upper and lower arms and a connecting portion, said connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position with said upper arm extending across table top in an angular relation to said forward edge so as to overlie said printing position and support said platen mechanism over said printing position, and said lower arm extending similarly beneath said table top so that its forward end underlies said printing position, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, means located beneath said table top for guiding and advancing printing devices from said magazine to said printing position, a driving unit for said platen mechanism located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame, means operatively connecting said driving unit to said platen mechanism comprising a first rock shaft extending parallel to said forward edge and carried by said lower arm beneath said table top, a second rock shaft parallel to said first shaft and carried by said upper arm above said table top, means forming an operative driving connection between said driving unit and the adjacent end of said first shaft, means forming an operative driving connection between said second shaft and said platen mechanism, and means extending along said connecting portion of said frame and forming an operative connection between the other ends of said shafts.

30. In a printing machine through which a series of printing devices are adapted to be passed in series, a desk-like frame providing a substantially rectangular table top having a forward edge, said frame having vertical end walls formed from sheet metal panels, means defining a printing position adjacent to said forward edge of said table top, a pair of supporting bars located in spaced relation parallel to said forward edge and adjacent to the front and rear edges respectively of said table top, said bars being connected at their ends to said panels so as to be supported thereby in downwardly spaced relation to said table top, a substantially rigid C-shaped printing frame and platen mechanism supported thereby, said frame having upper and lower arms and a connecting portion, said connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position with said upper arm extending across table top in an angular relation with respect to said forward edge

so as to overlie said printing position and support said platen mechanism over said printing position, and said lower arm extending similarly beneath said table top so that its forward end underlies said printing position, said connecting portion being connected to said rear bar so as to be supported thereby and said forward end of said lower arm being connected to and supported by said forward bar, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, means for guiding and advancing printing devices from said magazine to said printing position, and a driving unit for said platen mechanism supported on said rear bar and located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame.

31. In a printing machine through which a series of printing devices are passed in series, a frame providing a substantially rectangular table top having a forward edge, means defining a printing position adjacent to said forward edge of said table top, a substantially rigid printing frame and a platen mechanism supported thereby, said frame having a connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position and said printing frame having an upper arm extending across the table top from said connecting portion in an angular relation to said forward edge so that said arm overlies said printing position and supports said platen mechanism over said printing position, and means for actuating said shaft from said actuating unit including an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, means disposed beneath said table top for guiding and advancing printing devices from said magazine to said printing position, a driving unit for said platen mechanism located beneath said table top, means operatively connecting said driving unit to said platen mechanism comprising a rock shaft extending substantially parallel to said forward edge and carried by said upper arm above said table top so as to project on opposite sides of said arm, means forming an operative driving connection to said platen mechanism from the adjacent end of said shaft, and means driven by said actuating unit beneath said table top and extending upwardly along said connecting portion of said printing frame and operatively connected to the other end of said shaft.

32. In a printing machine through which a series of printing devices are adapted to be passed in series, a desk-like frame providing a substantially rectangular table top having a forward edge, said frame having vertical end walls formed from sheet metal panels, means defining a printing position adjacent to said forward edge of said table top, a pair of supporting bars located in spaced relation parallel to said forward edge and adjacent to the front and rear edges of said table top, said bars being connected at their ends to said panels so as to be supported thereby in downwardly spaced relation to said table top, a skirt portion formed from sheet metal and connected betwen said panels so as to extend rearwardly from the forward side of said panels in spaced relation to said table top and then downwardly so as to provide kneehole space for an operator seated in front of the machine, a substantially rigid C shaped printing frame having upper and lower arms and a connecting portion, said connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position with said upper arm extending across the table top in an angular relation with respect to said forward edge so as to overlie said printing position, platen mechanism supported by said upper arm over said printing position, and said lower arm extending similarly beneath said table top so that its forward end underlies said printing position, said connecting portion being connected to said rear bar so as to be supported thereby and said forward end of said lower arm being connected to and supported by said forward bar, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, advancing means disposed beneath said table top for advancing printing devices from said magazine to said printing position, a driving unit for said platen mechanism and said advancing means supported on said rear bar and located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame, and an operating motor connected to said driving unit and supported on the rear face of said skirt portion.

33. In a printing machine through which a series of printing devices are passed in series, a frame providing a substantially rectangular table top having a forward edge, said table top having an opening therein defining a printing position adjacent to said forward edge of said table top, a substantially rigid C-shaped printing frame having upper and lower arms and a connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position and with said upper arm extending across the table top in an angular relation with respect to said forward edge so as to overlie said printing position, and said lower arm extending similarly beneath said table top so that its forward end underlies said printing position, cooperating impression means mounted in part on said lower arm beneath said opening and in part on said upper arm over printing position, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame, means disposed beneath said table top for guiding and advancing printing devices from said magazine to said printing position, and a driving and control unit for said impression means and said advancing means located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame.

34. In a printing machine through which a series of printing devices are passed in series, a frame providing a substantially rectangular table top having a forward edge, means defining a printing position adjacent to said forward edge of said table top, a substantially rigid C-shaped printing frame having upper and lower arms and a connecting portion, said connecting portion projecting upwardly from said table top rearwardly of and a substantial distance laterally with respect to said printing position with said upper arm extending across the table top in an

angular relation to said forward edge so as to overlie said printing position, platen mechanism supported by said upper arm over said printing position, and said lower arm extending angularly beneath said table top so that its forward end underlies said printing position, an upstanding magazine extending upwardly from said table top for containing a supply of printing devices located adjacent to said upwardly projecting connecting portion of said printing frame and located rearwardly of the point where said table top meets the forwardmost surface of said connecting portion, advancing means disposed beneath said table top for advancing printing devices from said magazine to said printing position, a driving unit for said platen mechanism located beneath said table top in the generally triangular space rearwardly of the lower arm of said printing frame, means operatively connecting said driving unit to said platen mechanism including a reciprocatory vertical link extending upwardly along said connecting portion and located closely adjacent to the point where said table top meets the forward-most surface of said connecting portion.

35. In a printing machine through which a series of printing devices are adapted to be advanced along a guideway in a step-by step manner from a supply magazine to and through printing position, platen mechanism at said printing position operable to produce a printing impression from a printing device at printing position, printing device advancing means operable to advance printing devices one by one along said guideway in a step-by-step manner, a constantly driven power source, a main shaft, a one-revolution master clutch for connecting said main shaft to said power source, a master clutch control member for said master clutch, a second one-revolution clutch having its driving member driven by said main shaft and its driven member operatively connected to said platen mechanism to operate the same, a second clutch control meber for controlling said second clutch, a third one-revolution clutch having its driving member driven by said main shaft and its driven member operatively connected to said printing device advancing means to operate the same, a third clutch control member for said third clutch, means for selectively or concurrently actuating said second and third clutch control members to inactive positions such that the associated clutches are conditioned for engagement, means operable as an incident to such actuation of either of said second or third clutch members to similarly actuate said master clutch control member to its inactive position to cause engagement of the master clutch, latching means operable as an incident to such actuation of either of the second or third control members to latch the same in inactive position, and means operable by the driven member of said master clutch to release said latching means after said second and third clutches have engaged and thereby condition said second and third control members for terminating the engagement of said second and third clutches.

36. In a printing machine through which a series of printing devices are adapted to be passed from a supply magazine to and through a printing position in said machine, platen mechanism operable in each cycle of operation to produce a printing impression from the printing device at printing position, advancing means operable in each cycle of operation to advance a different printing device into printing position, driving mechanism comprising a constantly operating main drive member, a one-revolution master clutch adapted to be driven from said main drive member and having a normally operative master stop member for disengaging said master clutch, said master stop member being shiftable to an inactive position to permit engagement of said master clutch, a one-revolution advancing clutch and a one-revolution platen clutch having their driving members driven by said master clutch and their driven members operatively connected respectively with said advancing means and said platen mechanism, independently shiftable stop members for said advancing clutch and said platen clutch normally operative to disengage their respective clutches and being individually shiftable to inactive positions to permit engagement of their respective clutches, means operable by either of said independently shiftable stop members as it is shifted to inactive position to shift said master stop member to inactive position, latch means operable to latch said independently shiftable stop members in their inactive positions until engagement of said master clutch has initiated rotation of the driven members of said advancing and platen clutches, and latch release means actuated by said master clutch upon engagement thereof to release said latch and thereby release the latched stop members for return to normal operative positions.

37. In a printing machine of the character described through which printing devices are advanced one by one and in a step by step manner from a supply magazine through a plurality of stations including a station which constitutes a printing position, means operable to impart step by step advance movement to printing devices along said guideway so as to move the printing device from station to station along said guideway, a positioning pawl associated with said guideway at one of said stations and having a stop lug adapted to be moved into an operative position in said guideway in the path of the leading edge of a printing device advancing into said station, and also having a positioning tooth adapted to be moved into an operative position in said guideway and into cooperation with a positioning recess formed on such a printing device, and actuating means for said positioning pawl operable in timed relation to said advancing means to position said stop lug in operative position as a printing device approaches the station with which said pawl is associated, to thereby impart a preliminary positioning action to said printing device, said actuating means being thereafter operable to move said tooth into its operative position in said guideway to engage the recess in the printing device and thereby impart a final positioning action to the printing device at said station.

38. In a printing machine of the character described through which printing devices are advanced one by one and in a step by step manner from a supply magazine through a plurality of stations including a station which constitutes a printing position, advancing means operable to impart step by step advance movement to printing devices along said guideway so as to move the printing device from station to station along said guideway, a positioning pawl associated with said guideway at one of said stations and having a stop lug and a positioning tooth adapted to be

moved successively into said guideway as said pawl is moved from an inoperative retracted position toward said guideway, and actuating means for said positioning pawl operable in timed relation to said advancing means to position said stop lug in an operative position ahead of a printing device as it approaches the station with which said pawl is associated, to thereby impart a preliminary positioning action to said printing device, said actuating means being thereafter operable upon said pawl to move said tooth into its operative position in said guideway and into engagement with a positioning recess in said printing device to thereby impart a final positioning action to the printing device at said station.

39. In a printing machine of the type through which printing devices are advanced seriatim past a printing position, means providing a table top upon which a sheet may be supported for the performance of a printing operation, means including platen means and an anvil defining a printing position located adjacent to the forward edge of said table top, printing device advancing means operable to advance printing devices one by one along a path located beneath said table top to said printing position, said path including a portion located a substantial distance laterally of said printing position, and means defining an inspection window in said table top through which the printing devices may be viewed while passing through said portion of said path.

40. In a printing machine of the type through which printing devices are advanced seriatim past a printing position, means providing a table top upon which a sheet may be supported for the performance of a printing operation, means including platen means and an anvil defining a printing position located adjacent to the forward edge of said table top, printing device advancing means operable to advance printing devices one by one along a path located beneath said table top to said printing position, said path including a portion extending parallel to said forward edge, and means defining an inspection window in said table top overlying said portion of said path and located a substantial distance laterally of said printing position so that the printing devices may be viewed conveniently from an operator's normal position forwardly of the machine.

41. In a printing machine of the character described through which a series of printing devices are passed, means providing a table top upon which a sheet may be positioned for the performance of a printing operation, means including an anvil and a platen defining a printing position adjacent the forward edge of said table top, a magazine for receiving a supply of printing devices, said magazine being located near the rear edge of said table top and adjacent to one end thereof, advancing means for advancing the lowermost printing device in said magazine forwardly along a first path from said magazine beneath said table top to a transfer position, a second advancing means operable to engage the printing device after it has reached said transfer position and to move said printing device along a second path located parallel to the forward edge of said table top, said path being so located as to extend to a second transfer position rearwardly of said printing position, a third advancing means operable to engage the printing device in said second transfer position to advance the same along a third path forwardly and into printing position, and means providing an inspection window in said table top overlying said second path and located a substantial distance laterally of said printing position.

42. In a printing machine through which printing devices are advanced one by one, means providing first and second printing device guideways disposed substantially at right angles to each other so as to intersect in a transfer station and along which guideways each printing device is advanced in succession, reciprocatory printing device advancing means operatively associated with each of said guideways, and depressible means in said first guideway located in the path of a printing device being advanced therethrough into said transfer station and adapted to be depressed by such an advancing printing device and to resume a normal elevated position after the printing device has passed into said transfer station, said depressible means having abutment surfaces thereon operable in said normal elevated position to prevent retrograde motion of the printing device from said transfer station along said first guideway, and said abutment surfaces being disposed in positions to cooperate with said second guideway in guiding the printing device when the printing device is advanced from said transfer station along said second guideway.

43. In a printing machine having a printing position and through which printing devices are adapted to be advanced in series from a supply magazine to said printing position, platen mechanism operable in each cycle of its operation to produce a printing impression from a printing device at printing position, printing device advancing means operable in its cycles of operation to advance printing devices one by one to said printing position, independently operable actuating means for said advancing means and said platen mechanism, manual means normally operable to initiate concurrent operation of said actuating means, and normally inactive automatic control means including a replaceable cam and an actuating ratchet wheel assembly operable in its active adjustment to disable said advancing means in selected sequence in successive actuations of said manual means and means operable to prevent return of said control means to its inactive adjustment when said advancing means is disabled.

44. In a printing machine through which a series of printing devices are passed one by one and in a step by step manner such that each printing devices comes to rest at a printing position in said machine, advancing means operable in each cycle of its operation to advance a different printing device to printing position, platen mechanism operable in each cycle of its operation to produce a printed impression from a printing device at printing position, a skip pedal for initiating a cycle of operation of said advancing means, a repeat pedal for initiating a cycle of operation of said platen mechanism, a consecutive pedal operable to initiate concurrent cycles of operation of said advancing means and said platen mechanism to produce a single printed impression from each printing device, and automatic means for controlling the effectiveness of said consecutive pedal, said automatic means being shiftable between repeat, multiprint and consecutive adjustments, means for actuating said automatic control means, means for disabling said actuating means when said automatic control means is in its repeat or consecutive po-

sitions of adjustment and for rendering said actuating means effective when said automatic control means is in its multiprint adjustment, said automatic control means being operable in its multiprint adjustment in a series of operations of said consecutive pedal to disable said advancing means in predetermined selected control sequence whereby to produce a predetermined number of printed impressions from each printing device, and said automatic control means in its repeat adjustment being operable to disable said advancing means in each operation of said consecutive pedal.

45. In a printing machine through which a series of printing devices are passed one by one and having a printing position and platen mechanism at said printing position operable through a printing cycle to produce a printed impression from a printing device at printing position, printing device advancing means operable in each cycle of its operation to advance a different printing device to printing position, manually controlled means normally operable when actuated to concurrently initiate operation of said platen mechanism and said printing device advancing means in predetermined cyclic relation such that but a single printing operation is performed from each printing device, means for disabling said printing device advancing means when a printing device is to be maintained at printing position for the performance of additional printing operations therefrom, automatic control means adjustable from an inoperative relation to an operative relation for rendering said disabling means active and inactive in selected sequence whereby to render the machine operative to produce a selected number of printing impressions from each printing device, manually operable means for adjusting said automatic control means between its operative and inoperative relations, and latching means associated with said manually operable adjusting means and operable to prevent movement of said automatic control means from its operative relation to its inoperative relation when less than the selected number of printing impressions have been made from the printing device at printing position.

46. In a printing machine through which a series of printing devices are passed one by one and in a step by step manner such that each printing device comes to rest at a printing position in said machine, advancing means operable in each cycle of its operation to advance a different printing device to printing position, platen mechanism operable in each cycle of its operation to produce a printed impression from a printing device at printing position, a skip pedal for initiating a cycle of operation of said advancing means, a repeat pedal for initiating a cycle of operation of said platen mechanism, a consecutive pedal operable to initiate concurrent cycles of operation of said advancing means and said platen mechanism to produce a single printed impression from each printing device, automatically controlled means having an inactive relation and adapted to be adjusted to an active relation to disable said advancing means in selected sequence in a series of actuations of said consecutive pedal whereby to produce a predetermined number of printed impressions from each printing device, and means operable upon said control means when said control means is in its active relation to latch said control means in its active relation until the predetermined number of printed impressions have been made from a printing device at printing position.

47. In a printing machine through which a series of printing devices are passed one by one and in a step by step manner such that each printing device comes to rest at a printing position in said machine, advancing means operable in each cycle of its operation to advance a different printing device to printing position, platen mechanism operable in each cycle of its operation to produce a printed impression from a printing device at printing position, a skip pedal for initiating a cycle of operation of said advancing means, a repeat pedal for initiating a cycle of operation of said advancing means, a repeat pedal for initiating a cycle of operation of said platen mechanism, a consecutive pedal operable to initiate concurrent cycles of operation of said advancing means and said platen mechanism to produce a single printed impression from each printing device, and automatic means for controlling the effectiveness of said consecutive pedal, said automatic means being shiftable between repeat, multiprint and consecutive adjustments, means for actuating said automatic control means, means for disabling said actuating means when said automatic control means is in its repeat adjustment or its consecutive adjustment for rendering said actuating means effective when said automatic control means is in its multiprint adjustment, said automatic control means being operable in its multiprint adjustment in a series of operations of said consecutive pedal to disable said advancing means in predetermined selected control sequence whereby to produce a predetermined number of printed impressions from each printing device, latching means operable to latch said control means in said multiprint adjustment and to release the same for shifting to its other positions of adjustment only at the conclusion of a selected one of the cycles in the control sequence, and said automatic control means in its repeat adjustment being operable to disable said advancing means in each operation of said consecutive pedal.

48. In a printing machine having a printing position and through which printing devices are adapted to be advanced in series from a supply magazine to said printing position, platen mechanism operable to produce a printed impression from a printing device at printing position, advancing means operable to advance printing devices one by one to said printing position, independently operable actuating means for said advancing means and said platen mechanism, manual means normally operable to initiate concurrent operation of said actuating means, normally inactive automatic control means operable in its active adjustment to disable said advancing means in selected sequence in successive actuations of said manual means and means operable to prevent return of said control means to its inactive adjustment except at a predetermined point in such sequence.

49. In a printing machine having a printing position and through which printing devices are adapted to be passed in series from a supply magazine to said printing position, platen mechanism operable in each cycle of its operation to produce a printing impression from a printing device at printing position, printing device advancing means operable in its cycles of operation to advance printing devices one by one to said

printing position, independently operable actuating means for said advancing means and said platen mechanism, manual means normally operable to initiate concurrent operation of said actuating means, and normally inactive automatic control means operable in its active adjustment to disable said advancing means in selected sequence in successive actuations of said manual means and means operable to prevent return of said control means to its inactive adjustment when said advancing means is disabled.

50. In a printing machine having a printing position and through which printing devices are adapted to be passed in series from a supply magazine to said printing position, platen mechanism operable to produce a printed impression from a printing device at printing position, advancing means operable to advance printing devices one by one to said printing position, a manually actuated control element for initiating each operative cycle of the machine, governing means adjustable to a first position for producing either a single printed impression from each of the successive printing devices or to a second position for producing a predetermined number of printed impressions from each of the successive printing devices, and means controlling shifting of said governing means from said second to said first position operable to insure completion of said predetermined number of printed impressions from a printing device at printing position.

51. In a printing machine through which a series of printing devices are adapted to be passed from a supply magazine to and through a printing position in said machine, platen mechanism operable in each cycle of operation to produce a printing impression from the printing device at printing position, advancing means operable in each cycle of operation to advance a different printing device into printing position, driving mechanism including a one-revolution platen clutch operable in each one-revolution cycle to operate said platen mechanism through a single cycle of operation, and an advancing clutch operable in each one-revolution cycle to operate said advancing mechanism through a single cycle of operation, a collector having a normal position wherein it is adapted to receive the printing devices after they are advanced past printing position and being shiftable to an unloading position, a repeat foot pedal having a link and lever connection with said platen clutch for initiating a one-revolution cycle of said platen clutch, a skip foot pedal having a link and lever connection with said advancing clutch for initiating a one-revolution cycle of said feed clutch, a consecutive foot pedal having a lost-motion connection with said link and lever connections of said skip pedal to prevent operation of said skip pedal, a normally inoperative latch effective when in its operative relation to latch said skip foot pedal against actuation, and an operating connection between said latch and said collector operable to shift said latch to its operative relation when said collector is in its unloading position and to be shifted to an inactive position when said collector is in its normal position.

52. In a printing machine adapted to employ substantially rectangular printing devices having spacing flanges projecting from the reverse face thereof along opposite ends and adapted to bear projecting identifying tabs along one side edge in selected identifying position, means including an anvil and platen means defining a printing position, a supply magazine, means defining a printing position, a supply magazine, means defining a printing device guideway from said magazine to said printing position, said guideway in at least a portion thereof being arranged for advancing movement of the printing devices therethrough with their spacing flanges extending downwardly and located substantially perpendicular to said portion of the guideway, said guideway in said portion having guide means including upper and lower plates for engaging the upper and lower surfaces of said printing devices, said guide means providing clearance space between said plates for any tabs that may project from said side edge of any one of said printing devices, advancing means operable to advance printing devices in a step by step manner along said guideway such that each printing device comes to rest at a predetermined position in said portion of said guideway, and at least one of said retaining plates having at least one opening therein through which the presence or absence of an identifying tab at a particular position on a printing device resting at said position may be determined.

53. In a printing machine adapted to employ substantially rectangular printing devices having side and end edges and adapted to bear projecting identifying tabs along one side edge in selected identifying positions, means including an anvil and platen means defining a printing position, a supply magazine, means defining a printing device guideway from said magazine to said printing position, said guideway in at least a portion thereof being arranged for advancing movement of the printing devices therethrough with their end edges located substantially perpendicular to said portion of the guideway, said guideway in said portion having guide means including upper and lower plates for engaging the upper and lower surfaces of said printing devices, said guide means providing clearance and space between said plates for any tabs that may project from said side edge of any one of said printing devices, advancing means operable to advance printing devices in a step-by-step manner along said guideway such that each printing device comes to rest at a predetermined position in said portion of said guideway, and at least one of said retaining plates having at an opening therein through which the presence or absence of an identifying tab at a particular position on a printing device resting at said position may be determined.

54. In a printing machine through which printing devices are adapted to be advanced one by one and in a step-by-step manner from a supply magazine into and through a printing position, impression means operable in each cycle of its operation to produce a printed impression from a printing device at printing position, printing device advancing means operable in each cycle of its operation to advance a different printing device into printing position, independently operable actuating means for said advancing means and said impression means, a first means for causing cycles of concurrent operation of said actuating means to thereby produce a single printed impression from each printing device, and automatic means operable when rendered active to disable said advancing means in selected sequence of the operating cycles initiated by said first means, and means operable to prevent return of said automatic means to its

inactive position when said advancing means is disabled.

55. In a printing machine through which a series of printing devices are adapted to be advanced along a guideway in a step-by-step manner from a supply magazine to and through printing position, impression means at said printing position operable to produce a printing impression from a printing device at printing position, printing device advancing means operable to advance printing devices one by one along said guideway in a step-by-step manner, a constantly driven power source, a main shaft, a one-revolution master clutch for connecting said main shaft to said power source, a master clutch control member for said master clutch, a second one-revolution clutch having its driving member driven by said main shaft and having its driven member operatively connected to said impression means to operate the same, a second clutch control member for controlling said second clutch, a third one-revolution clutch having its driving member driven by said main shaft and having its driven member operatively connected to said printing device advancing means to operate the same, a third clutch control member for said third clutch, means for selectively or concurrently actuating said second and third clutch control members to inactive positions such that the associated clutches are conditioned for engagement, means operable as an incident to such actuation of either of said second or third clutch members to similarly actuate said master clutch control member to its inactive position to cause engagement of the master clutch, and means operable under control of the driven member of said master clutch to maintain either or both of said second and third control members in actuated condition until said master clutch has engaged and operable thereafter to condition said second and third clutch control members for terminating the engagement of said second and third clutches.

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