Dec. 14, 1948. J. H. GRUVER ET AL 2,456,273

PRINTING MACHINE

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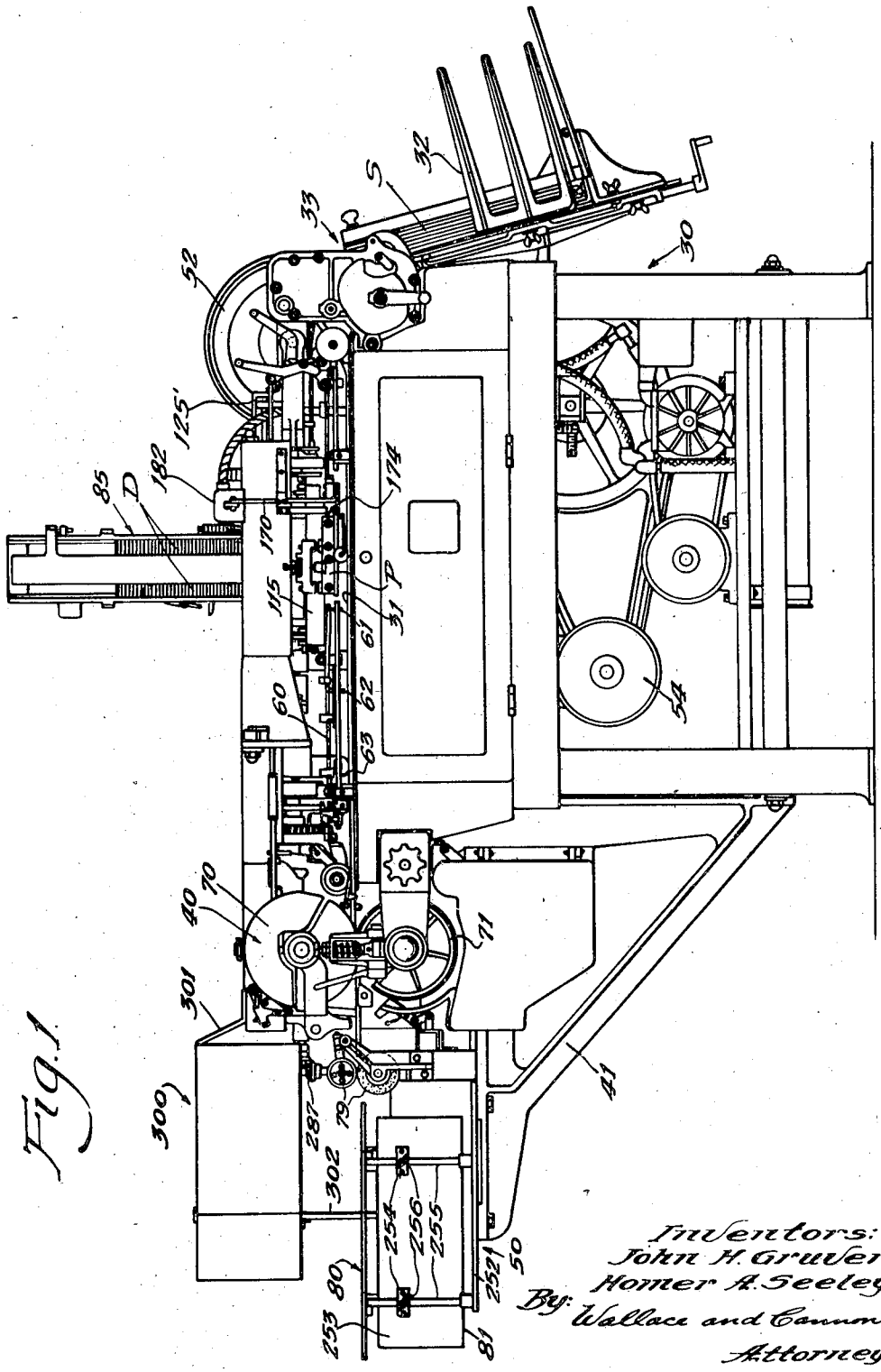


Fig. 1.

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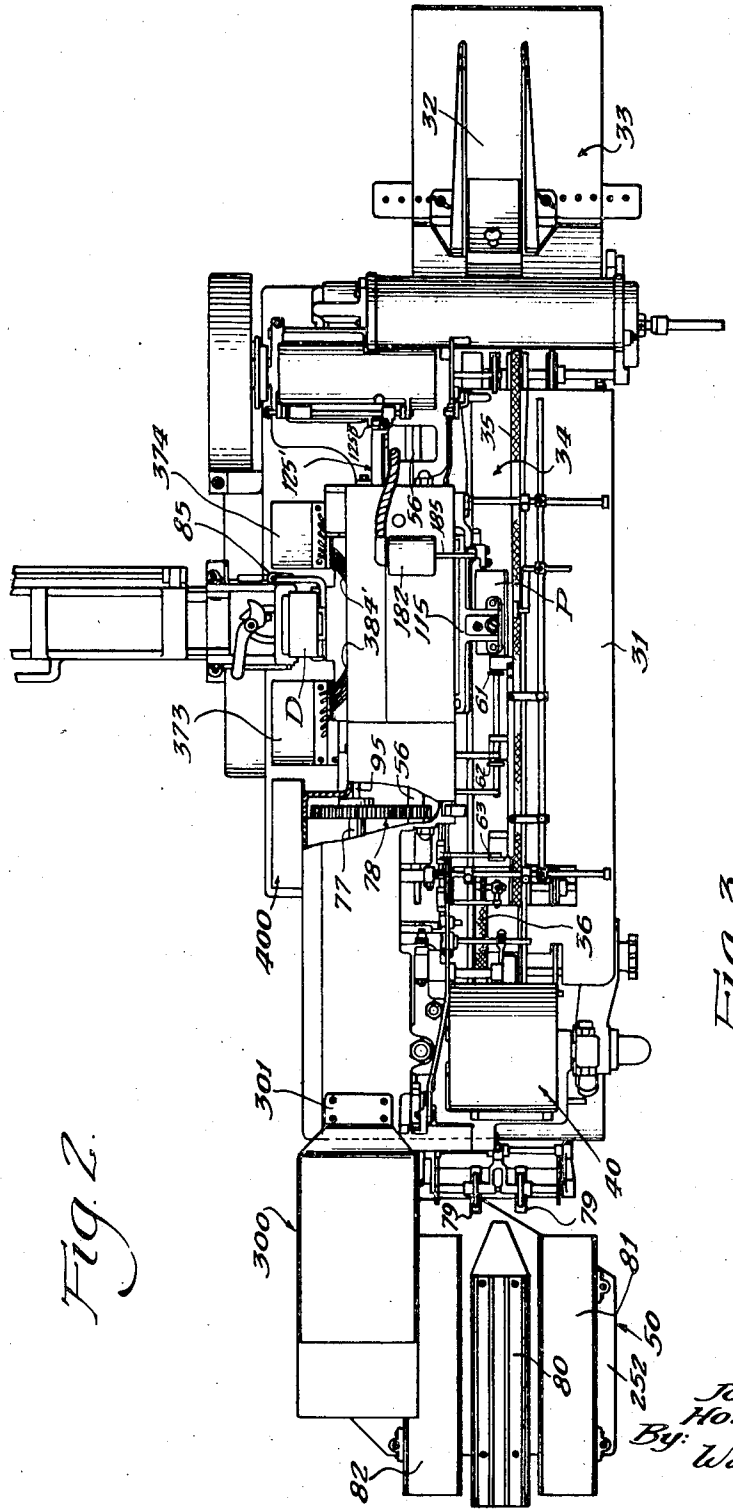


Fig. 2.

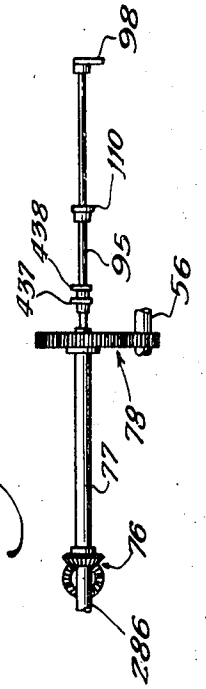


Fig. 3.

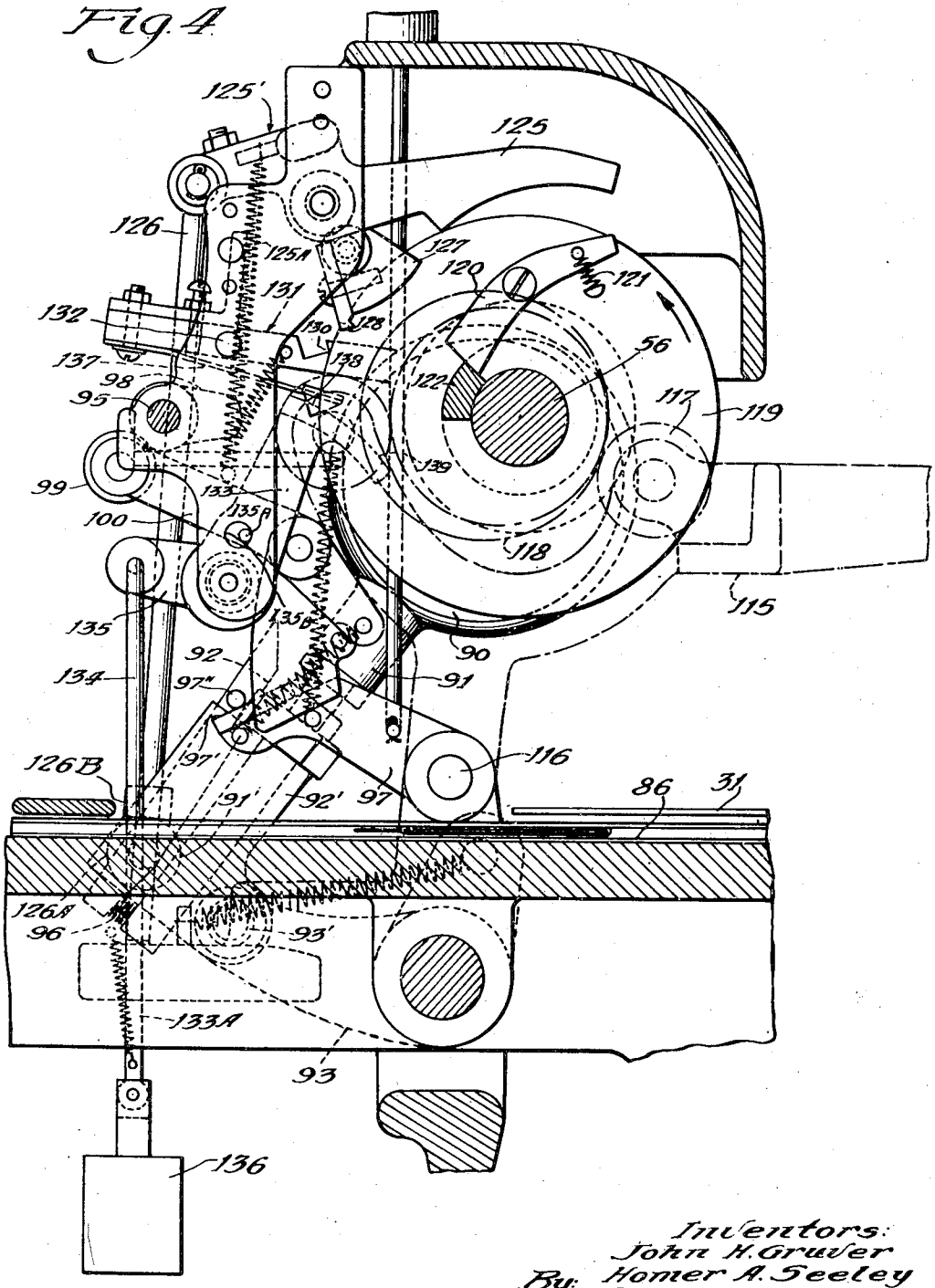
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Dec. 14, 1948. J. H. GRUVER ET AL 2,456,273

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Fig. 4



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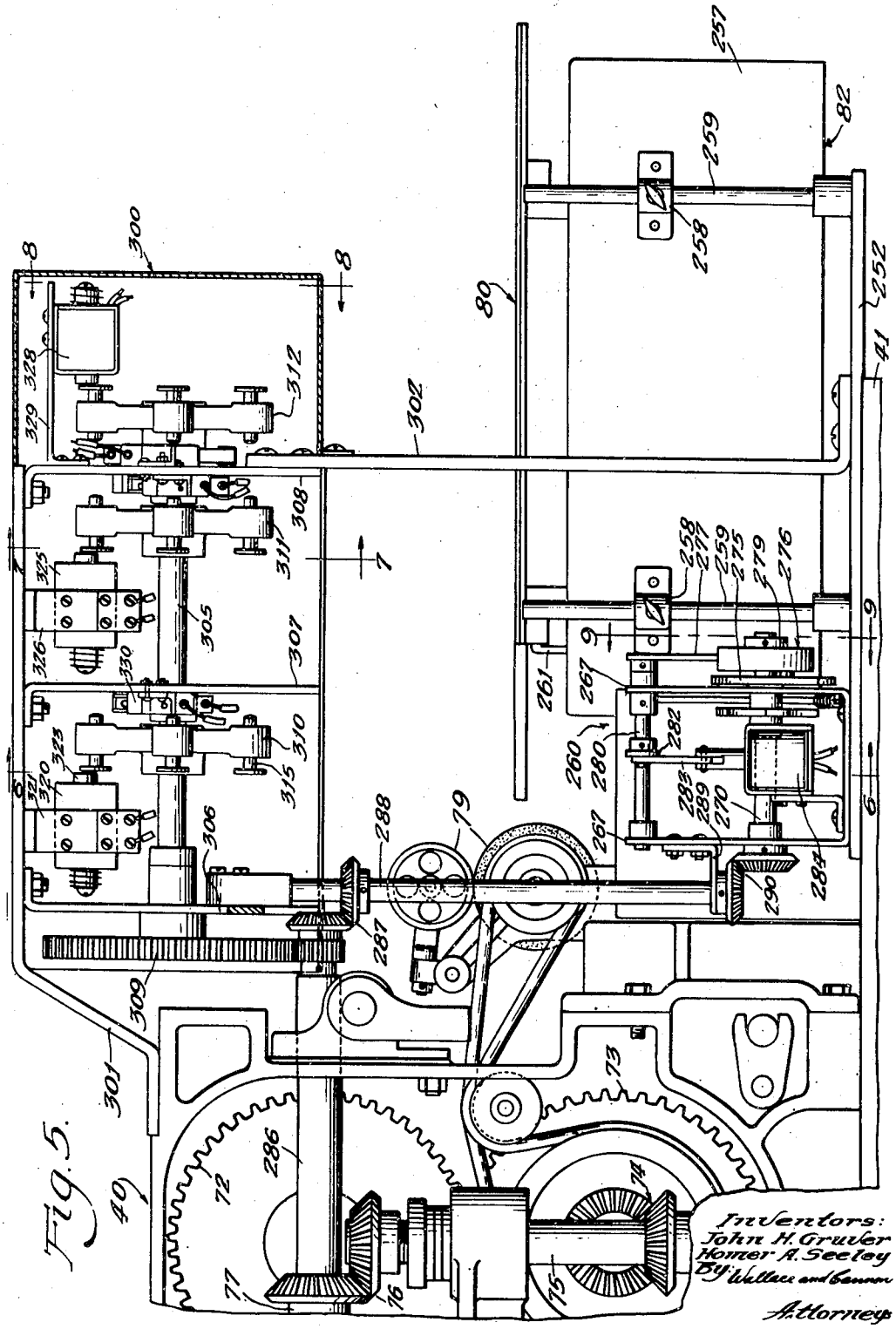


Fig. 5.

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Fig. 7.

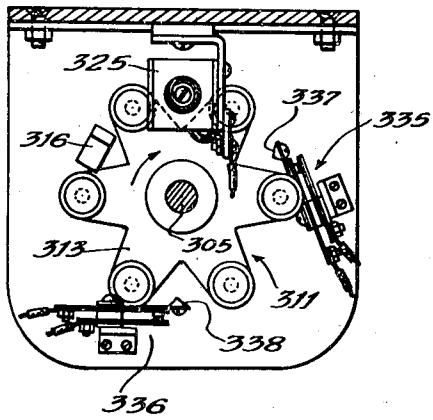
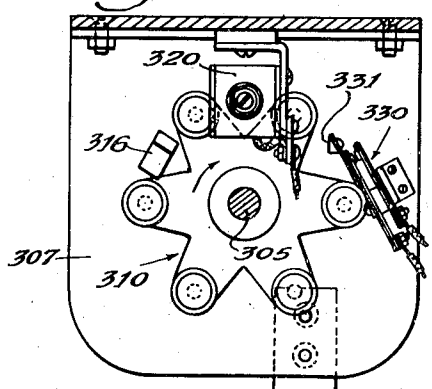


Fig. 6.



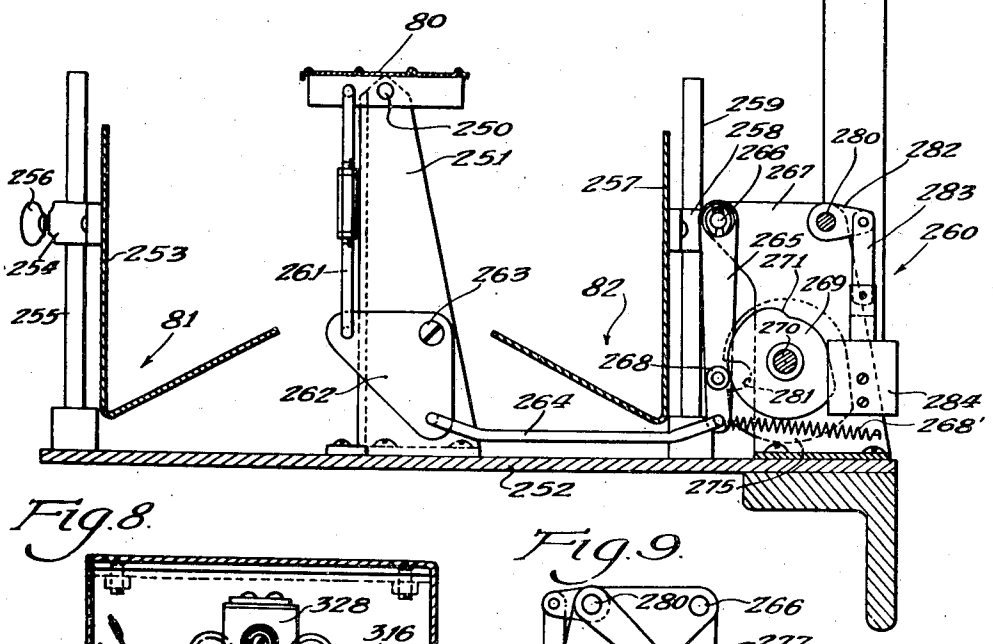


Fig. 8.

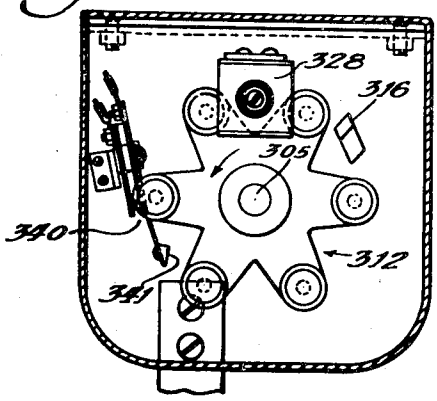
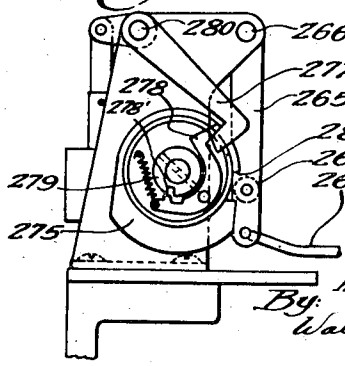


Fig. 9.



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Fig. 10.

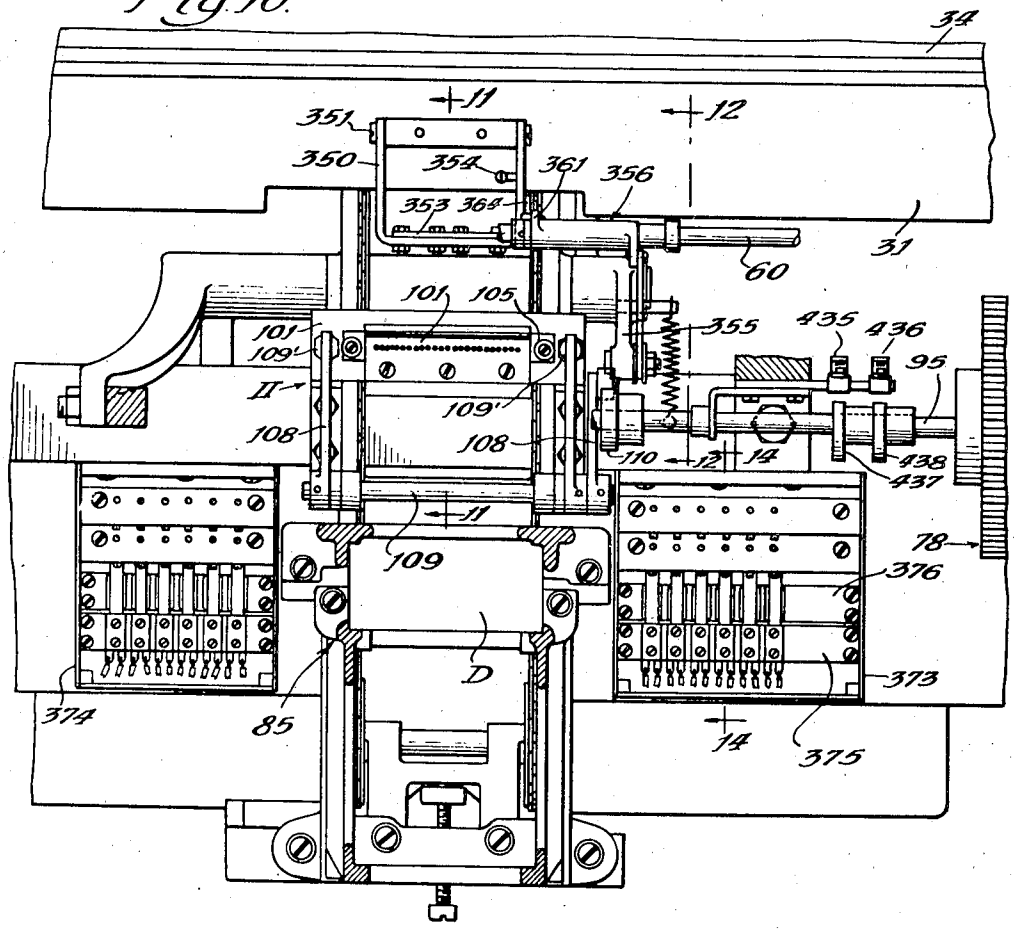
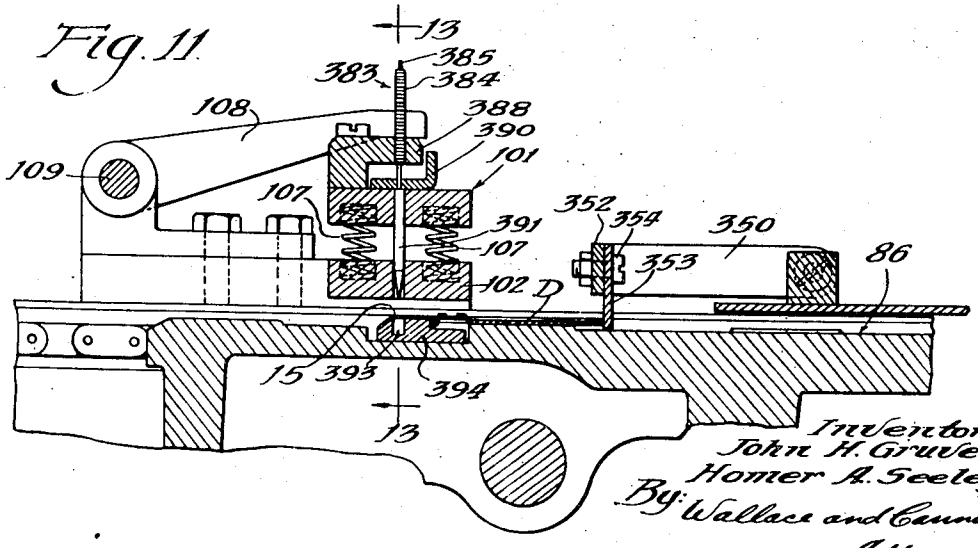


Fig. 11.



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Fig. 12.

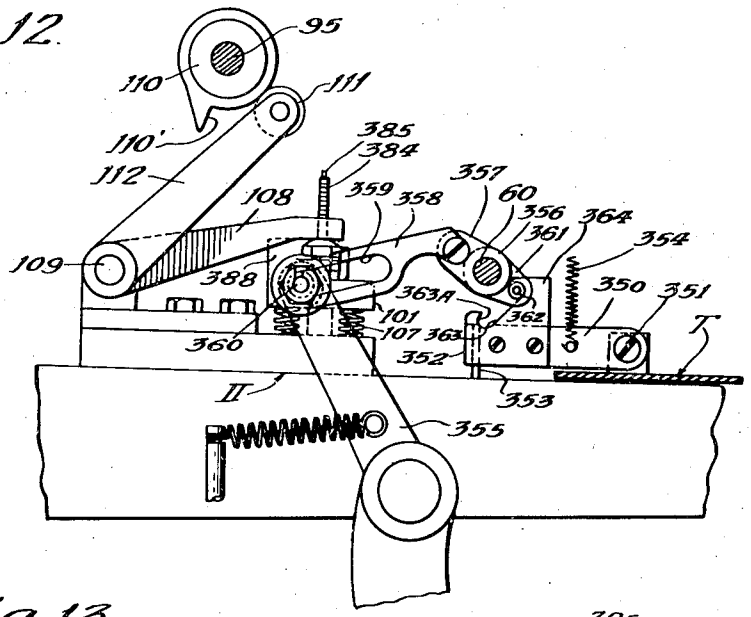


Fig. 13.

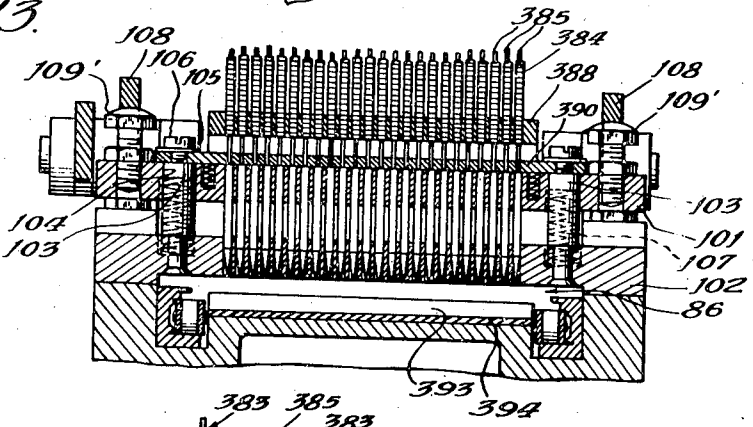
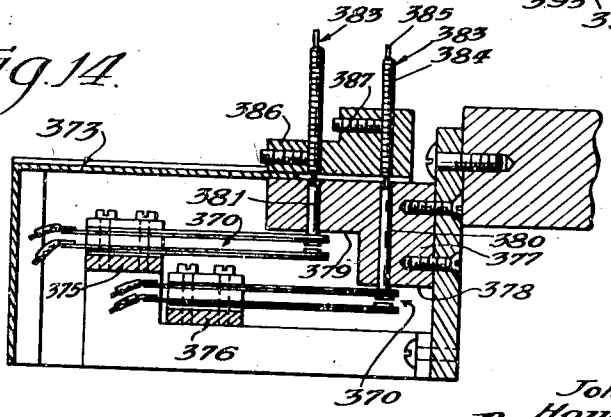


Fig. 14.



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Fig. 15.

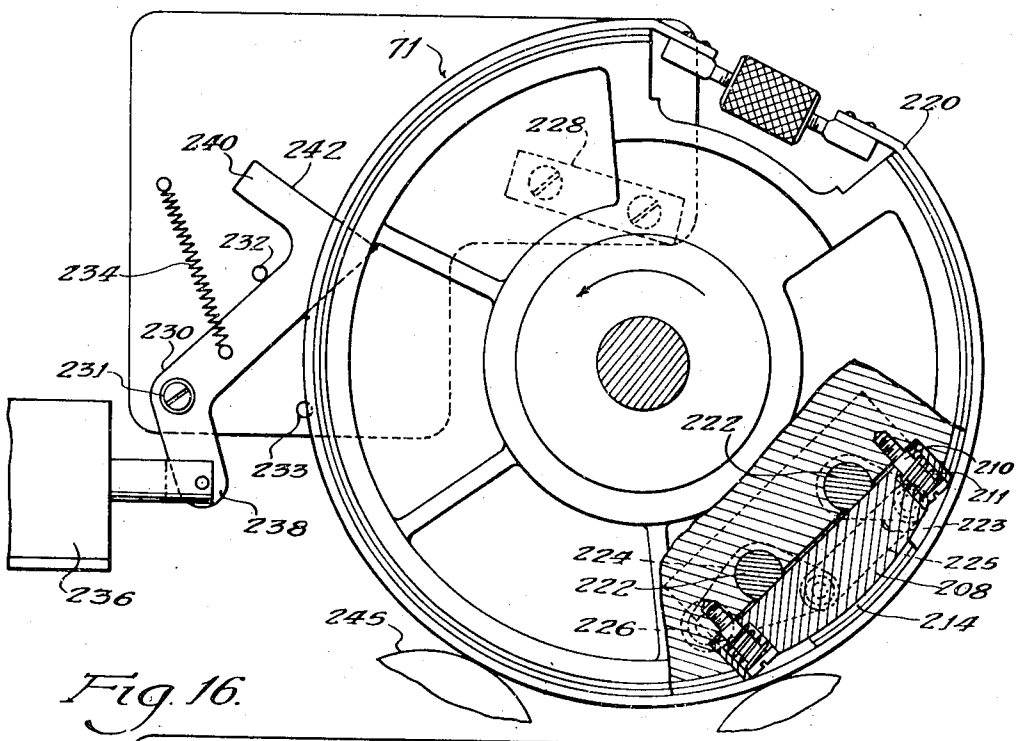
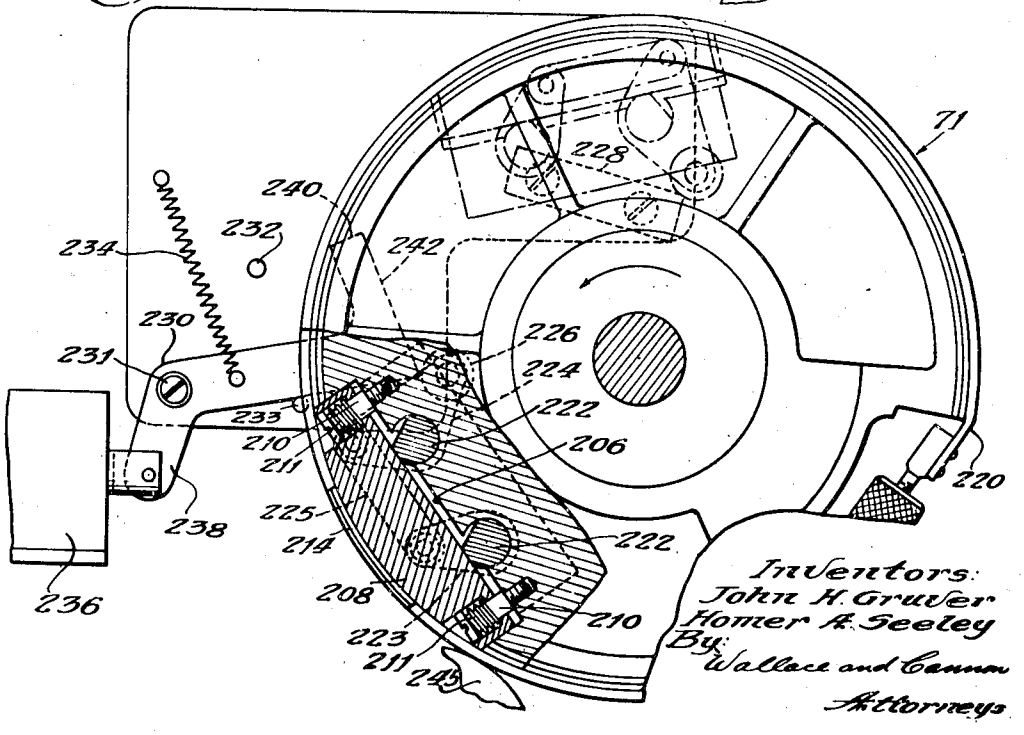


Fig. 16.



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Fig. 17.

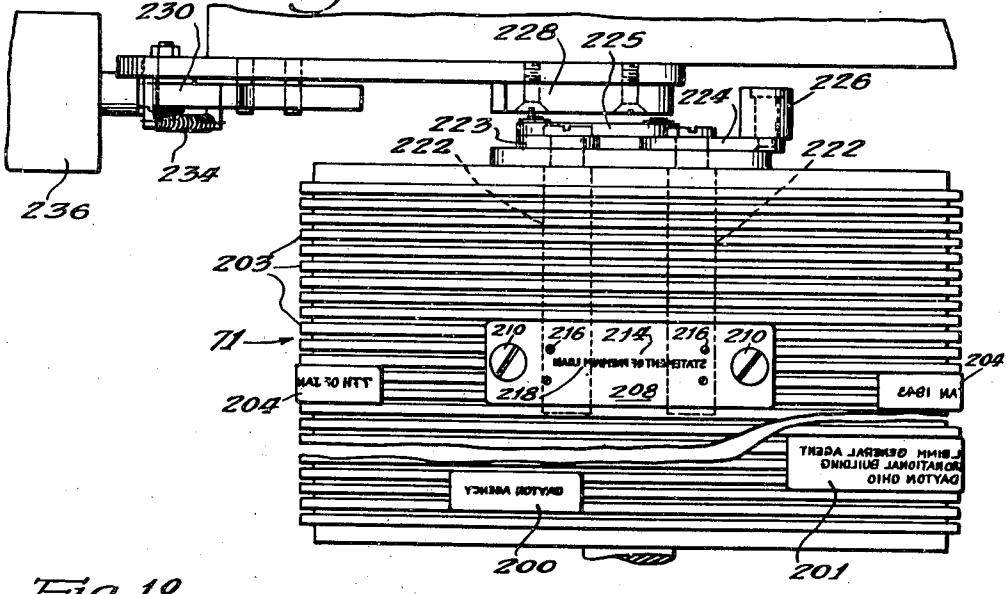


Fig. 18.

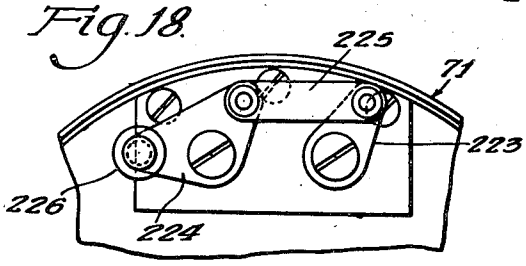
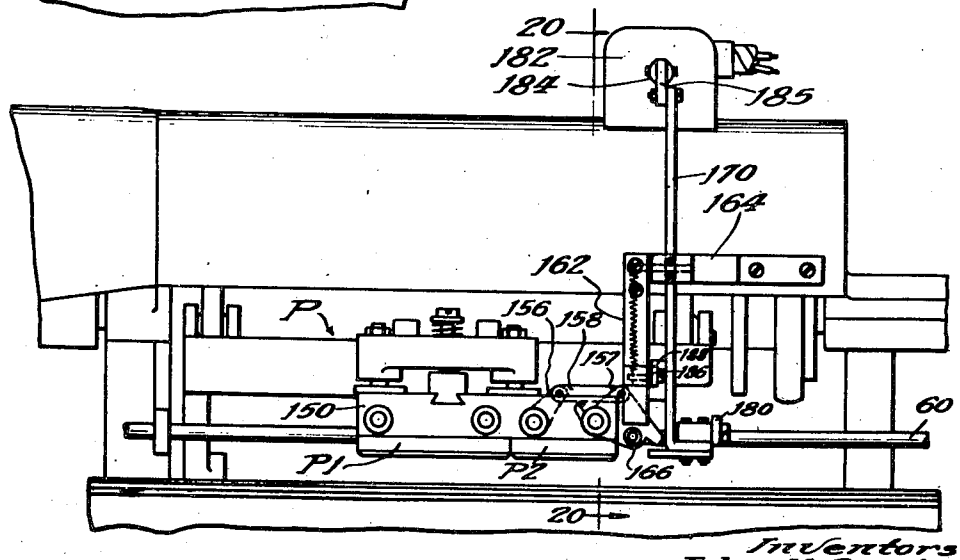


Fig. 19.



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Fig. 21.

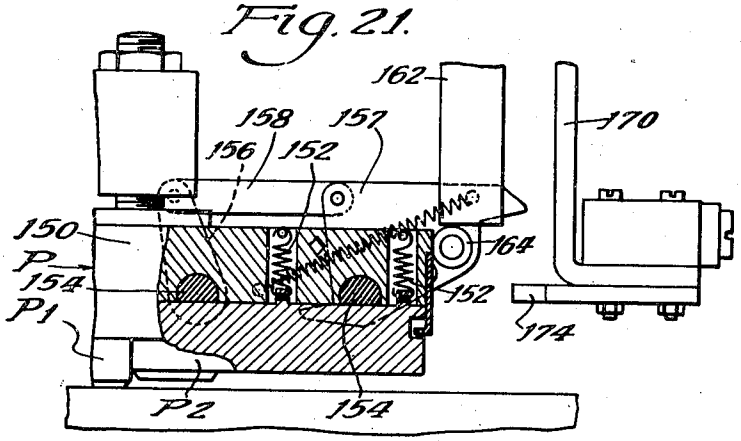
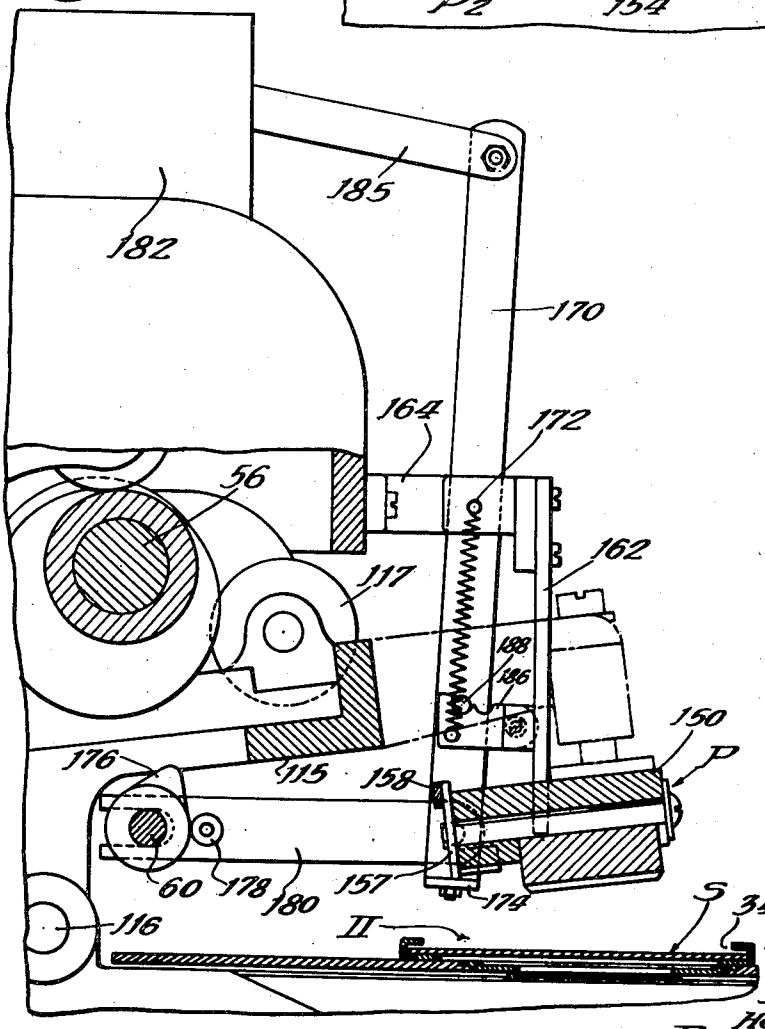


Fig. 20.



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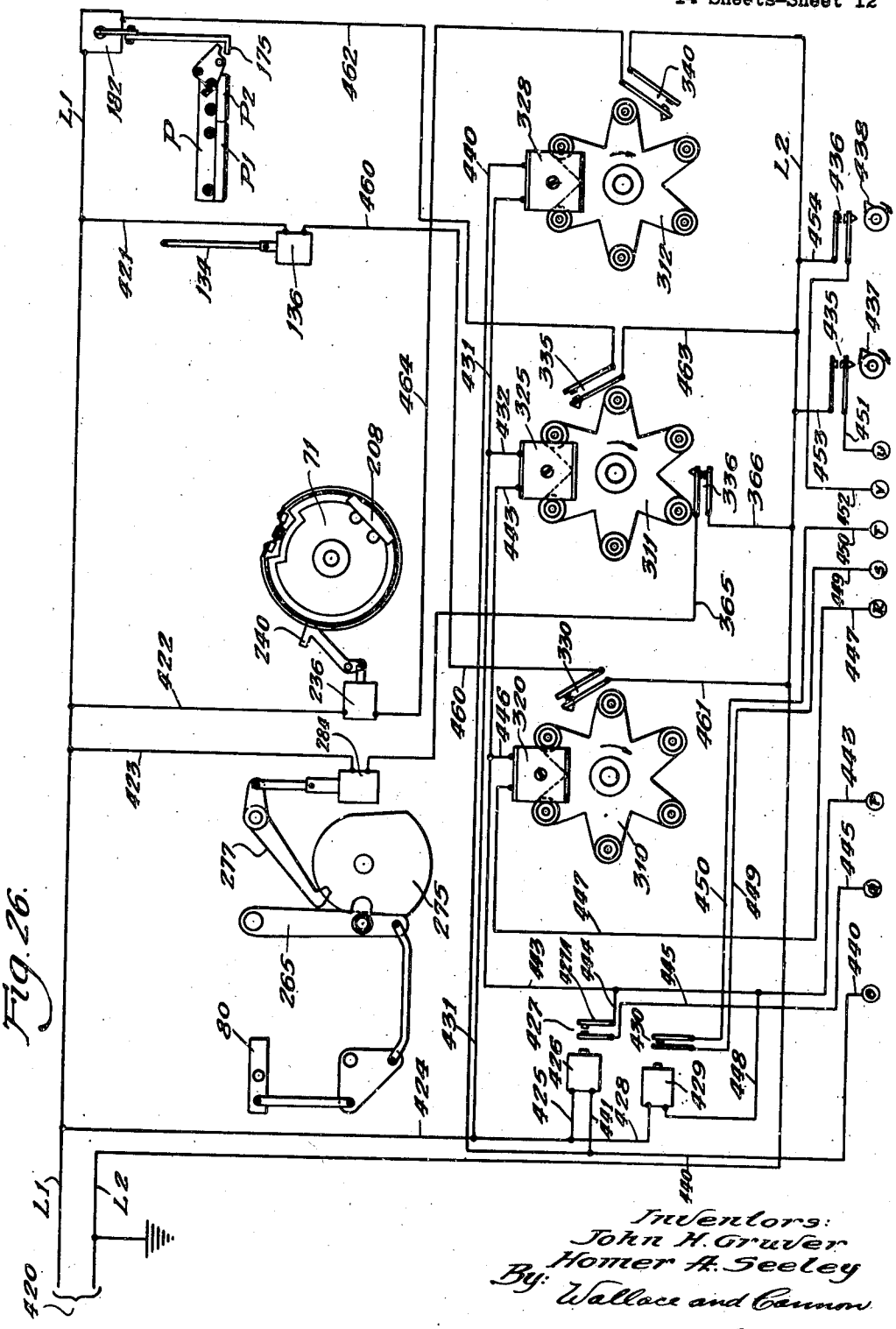


Fig. 26.

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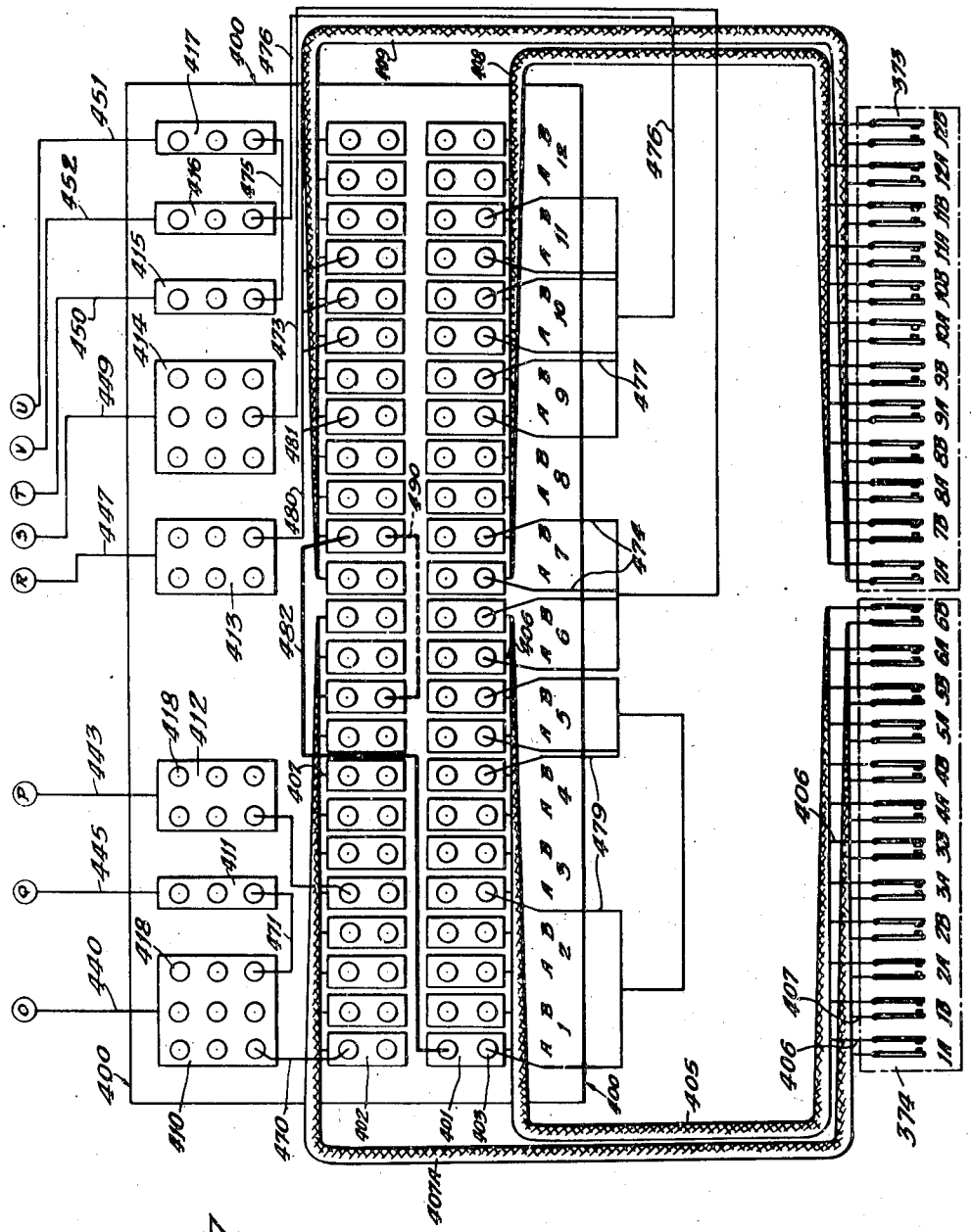


Fig. 27.

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Dec. 14, 1948. J. H. GRUVER ET AL 2,456,273

PRINTING MACHINE

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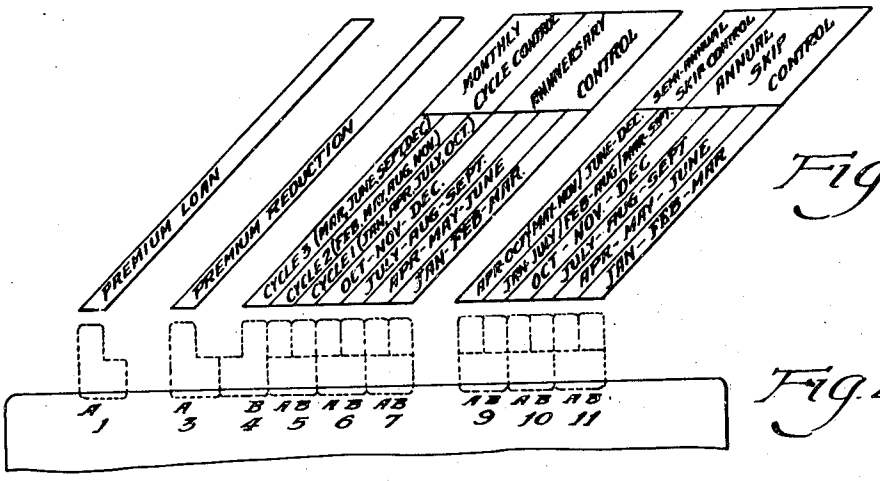


Fig. 28.

Fig. 28A.

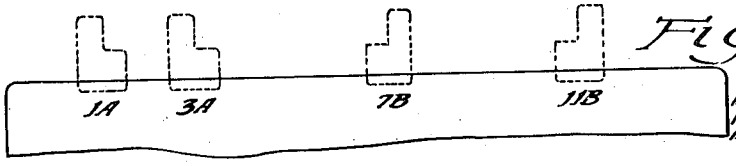


Fig. 28B.

ANNUAL
IN FILE 1 = JAN. ANNIVERSARIES
IN FILE 2 = FEB. ANNIVERSARIES
IN FILE 3 = MAR. ANNIVERSARIES

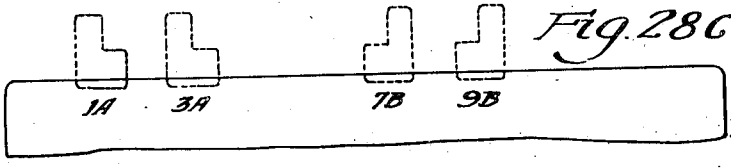


Fig. 28C.

SEMI-ANNUAL
IN FILE 1 = JAN. ANNIVERSARIES
IN FILE 2 = FEB. ANNIVERSARIES
IN FILE 3 = MAR. ANNIVERSARIES

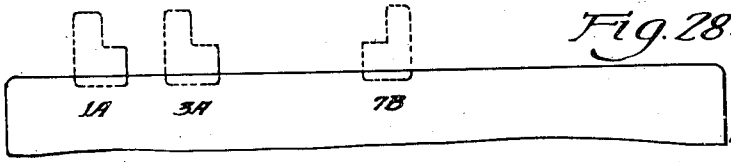


Fig. 28D.

QUARTERLY
IN FILE 1 = JAN. ANNIVERSARIES
IN FILE 2 = FEB. ANNIVERSARIES
IN FILE 3 = MAR. ANNIVERSARIES

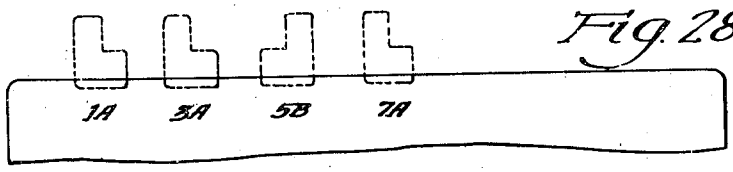


Fig. 28E.

MONTHLY

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Patented Dec. 14, 1948 2,456,273

UNITED STATES PATENT OFFICE

2,456,273

PRINTING MACHINE

John H. Gruver, East Cleveland, and Homer A. Seeley, Cleveland, Ohio, assignors to Addressograph-Multigraph Corporation, Wilmington, Del., a corporation of Delaware

Application December 26, 1944, Serial No. 569,878

9 Claims. (Cl. 101—2)

1

This invention relates to printing machines for producing business instruments, and particularly to such machines that produce instruments of the aforesaid character from and under control of individual printing and control devices passed seriatim through the printing machine.

Business instruments of the aforesaid character may embody different classes or kinds of data that may conveniently be classified as reoccurring data, changeable data, and special data. Such reoccurring data may include the form material, the date, a signature, the name of the company issuing the instruments and other information that is to appear on each of the instruments. The changeable data on an instrument of the aforesaid character usually consists of an identification such as a name and address, and other data such as one or more numerical amounts that constitute the usual or regular amount of the check, the amount of the bill, or the like. The special data may constitute special form-material or text, or may comprise special numerical data such as the amount of interest to be added to the regular amount of the instrument, or the amount of a dividend that is to be deducted from the regular amount, and in many instances the special data to be incorporated may include both numerical data and special text material.

Where business instruments such as bills, notices, checks or like business records or instruments are to be prepared at stated intervals for large groups of companies or persons, it is advantageous to employ an individual printing device of a relatively permanent character for each company or person to print the changeable data or information that normally forms part of each of the respective business instruments, so that by passing all of such printing devices through a printing machine, such changeable data pertaining to each company or person may be printed on an individual sheet or business instrument. Printing machines of the kind that employ such individual printing devices have heretofore been equipped for the printing of additional information on sheets passed therethrough, so that data such as a date, a signature or the like, may also be printed on such instruments in the course of operation of such a printing machine, and hence, by passing a group of printing devices through such a machine, it is possible to produce complete dated instruments embodying the changeable data pertaining to each of the persons or companies represented in such group of printing devices.

In instances where individual printing devices

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are thus employed, the system of filing or storing the printing devices is often such that in a particular run of the printing machine business instruments are to be prepared from only selected ones of a particular group, and in the past it has been customary to provide identifying means on the printing devices whereby selector mechanism in the printing machine might function to pass selected of the printing devices through the machine without making impressions therefrom. Thus certain of the printing devices were skipped, while business instruments were prepared pertaining to the other printing devices of the group, and such operation has been known as print-skip selection or control.

The business instruments produced in an instance such as the foregoing will be of a uniform or standard character in that the changeable data afforded on the same area or portion of each printing device will be printed on the related instrument, and the reoccurring data of the same general character or extent will be used or printed on each instrument, and in those situations where such uniform or standard instruments may be utilized in respect to each of the persons or companies to which the printing devices pertain, the procedure heretofore described constitutes an efficient and accurate way of preparing such instruments. In practice, however, it is found that among any large group of printing devices, many such printing devices of a group will usually pertain to persons to whom some special circumstance is applicable so that in respect to such persons a special instrument, including special data, must be prepared at stated intervals or on certain dates, and to enable such special instruments to be prepared in a simple and expeditious manner is the primary object of this invention.

An example of a situation where such special instruments must be prepared is found in the preparation insurance premium notices where special notices are required to set forth dividends on other amounts that are to be deducted from the regular premium, or to set forth interest charges that are to be added to the regular premium by reason of a policy loan made to the holder of the policy to which a printing device pertains. In most insurance companies provision is made for different premium payment schedules so that premiums on policies are arranged to fall due annually on the anniversary date of the policy, quarterly on the anniversary date and at three month intervals following the anniversary date, or monthly on the anniversary date and on the same date of each other month of the year

The premium notices that are payable on the anniversary of a policy may well be called anniversary premium notices, while the other notices payable quarterly or monthly on dates other than the anniversary may be termed regular premium notices, and in practice, the printing devices pertaining to the different policies are so prepared that each printing device embodies all of the changeable data that is to be printed on the regular premium notices prepared from such printing device. Thus, when an anniversary premium notice is to be prepared it is necessary that the related special data be incorporated in such notice, and to enable this to be accomplished in an efficient and simple manner is a further object of the present invention.

Where a special bill or notice is to be prepared from a particular printing device, this fact may be indicated by identifying means on the printing device, and the identifying means that thus serve to indicate that a special bill should be prepared may in some instances constitute a special identifying means that is placed upon such a printing device, or may constitute such a special identifying means in combination with other identifying means that are normally placed upon the printing device to indicate the payment period and to indicate the anniversary of the policy to which the printing device pertains, and to enable the extent and character of the data printed on such bills to be controlled by such identifying means on the printing devices is still another object of the present invention. Other and related objects are to enable the printing machine of the kind to which the present invention relates to print variable amounts of data on business instruments such as insurance premium notices under control of the identifying means carried on the printing device, and to enable the business instruments thus printed to be sorted as either regular or special notices under control of the identifying means carried by the printing devices from which the business instruments are printed.

The special notices that must be prepared in most instances require that additional numerical or text matter be added to the instruments and because of the wide variation that is encountered in a group of special bills it is customary to insert such additional information or text by means of the typewriter, and for this reason it is necessary to separate special bills from the regular bills that are printed in such a printing machine. It is therefore a further object of this invention to enable the regular bills produced by such printing machine to be collected in one group while the special bills are collected in another group so that they may then be finished by insertion of the required special data. An object related to the foregoing is to enable the printing machine in such an instance to insert a portion of the special data or text in at least certain of the special bills printed on the machine, and a more specific object is to enable the printing of such special text by the printing machine to be accomplished under the control of identifying means carried on the printing devices.

It has been pointed out hereinbefore that in the case of insurance premium notices, such notices must be prepared at stated intervals, and in practice, since there are premium notices that must be sent out each month in relation to the policies where monthly premium payments are required, it is customary for insurance companies to prepare their premium notices each month, and to simplify the setup and operation of the printing machine to accomplish such monthly runs of premium notices is a further and important object of the present invention. An object related to the foregoing is to enable the selector mechanism of a printing machine to be readily set up for the preparation of bills for any month of the year, and to accomplish the setup of the machine in such a manner that the operation of the machine may be readily coordinated with the character of the printing devices that are to be passed therethrough.

Other and further objects of the present invention will be apparent from the following description and claims are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment and the principle thereof and what we now consider to be the best mode in which we 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 front elevational view of a printing machine embodying the features of the invention;

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

Fig. 3 is a fragmental detail view of a portion of the driving and operating mechanism of the machine;

Fig. 4 is a fragmental vertical sectional view illustrating the drive mechanism of the platen and printing device advancing means;

Fig. 5 is a fragmental rear elevational view of the sorting mechanism and the storage mechanism of the machine;

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 5 and showing the sorting mechanism and a part of the storage mechanism;

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 5;

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 5;

Fig. 9 is a sectional view taken along the line 9—9 of Fig. 5 and illustrating the means that control the sorting mechanism;

Fig. 10 is a fragmental plan sectional view illustrating the sensing mechanism;

Fig. 11 is a fragmental vertical sectional view taken substantially along the line 11—11 of Fig. 10;

Fig. 12 is a fragmental vertical sectional view taken along the line 12—12 on Fig. 10;

Fig. 13 is a transverse vertical sectional view taken substantially along the line 13—13 of Fig. 11;

Fig. 14 is a fragmental vertical sectional view taken substantially along the line 14—14 of Fig. 10;

Fig. 15 is a vertical sectional view taken through the printing drum of the rotary printing unit of the machine;

Fig. 16 is a view similar to Fig. 15 and showing the operating parts thereof in different positions;

Fig. 17 is a fragmental plan view of the printing cylinder of the rotary printing unit of the machine;

Fig. 18 is a fragmental end elevational view of one of the ends of the printing drum shown in Fig. 17;

Fig. 19 is a fragmental front elevational view

of the platen mechanism, this view being in effect an enlarged illustration of a portion of the mechanism shown in Fig. 1;

Fig. 20 is a fragmental vertical sectional view taken substantially along the line 20—20 of Fig. 19;

Fig. 21 is an enlarged view of the platen mechanism similar to a portion of Fig. 19 and showing the parts in different positions and further illustrating the platen control mechanism;

Fig. 22 is a face view of a business instrument produced in the normal operation of the machine, this business instrument being what is hereinafter termed a regular instrument;

Fig. 23 is a face view of a printing device from which the business instrument of Fig. 22 may be produced;

Fig. 24 is a fragmental face view of a special business instrument produced in the machine of this invention;

Fig. 25 is a face view of a printing device from which the business instrument of Fig. 24 may be produced;

Figs. 26 and 27, when taken together, constitute a schematic wiring diagram illustrating the interconnection and manner of association of the elements of the machine;

Fig. 28 is a table showing one manner in which the various tab positions of the printing devices may be illustrated for use with the present machine; and,

Figs. 28A, 28B, 28C, 28D and 28E are fragmental views showing printing devices having various arrangements of identifying tabs mounted thereon.

The insurance bills or premium notices of the character for the production of which the present machine is particularly adapted are shown in detail in Figs. 22 and 24 of the drawings, and as shown in Fig. 22, the insurance bill is printed upon a sheet S having sections S1, S2, and S3 which constitute, respectively, a premium notice, a final notice and an official receipt. The section S1 is joined to the section S2 along a weakened line 10, while the section S2 is joined to the section S3 along weakened line 11 so that the various sections may be readily separated after the production of the complete business instrument has been completed. Business instruments such as that shown in Figs. 22 and 24 are adapted to be produced from and under the control of individual printing and control devices such as the printing and control devices D shown in Figs. 23 and 25, and while such printing devices may take many different forms, they are herein illustrated as being of the construction illustrated in Gollwitzer Patent No. 2,049,437, patented August 4, 1936.

The sheets S upon which the insurance bill, shown in Figs. 22 and 24 are produced are in the present instance in the form of preprinted sheets which carry a substantial portion of the reoccurring data that constitutes the text or form which it is desired to incorporate in the bill, and such preprinted text is indicated at F in Fig. 22 of the drawings. In addition to the form material F which is included upon the sheets S, it is often desirable to include other text which will be constant throughout a relatively long run of the machine, and such additional text is printed upon the bill by the present machine and is indicated at 218' in Fig. 20. Each such bill prepared in the present machine pertains, of course, to a particular person or thing, and the changeable data including identifying text or data N is therefore printed upon the bill and is derived from corresponding type characters N' embossed upon a printing device D. The bill which is prepared for a particular person, as identified by the text N, usually includes a money amount which constitutes part of the changeable data and is usually the same each time a normal or regular bill is prepared for this particular person, and such amount is thus ordinarily printed upon the bill, as at M, and this amount is derived from corresponding printing characters embossed on the printing device D as indicated at M' in Fig. 23. In respect to the preparation of insurance bills, certain of the characteristics or controlling data of the related contract of insurance must also be indicated on the bill, such as the day of the month upon which the premium is due, and this day is indicated on the completed bills and on each section thereof as indicated at 17, such material being derived from corresponding characters 17' embossed upon the printing device D. The date 17 is so printed upon the bill that the particular month and year in which the payment is due may be inserted or printed by other means as indicated at 18 in Fig. 22, and resort is had to this expedient because the printing devices that are passed through the machine in a particular run may relate to a number of different kinds of insurance contracts. In other words, many of the printing devices D may relate to insurance contracts upon which the premium is to be paid annually, and this fact is indicated as shown in Fig. 22 by the printed text 19 which is derived from corresponding printing characters embossed upon the printing device D at 19' in Fig. 23. In other instances the insurance contract to which a particular printing device D relates may call for quarterly payment of the premium, and in such an instance suitable text is printed as at 20 upon the bill Fig. 24, from corresponding type characters 20' formed on the printing device as shown in Fig. 25. In other instances, an insurance contract may call for monthly payment of the premiums, and in such a case a suitable legend is carried upon the printing device in the same position as the legend 19' so as to be reproduced in the same position on the bill which is printed therefrom.

As hereinabove pointed out, the month and the year in which the amount set forth in a particular bill is to be paid are printed from independent means, that is by means other than the type characters carried upon the related printing device D, for in a particular run of the machine, all the bills produced will be payable in a particular month and year. Therefore, the type necessary to print this month and year are set up in the machine and whenever a bill is printed, the bill will bear this particular month and year printed as at 18 in Fig. 22. However, in the production of bills in the present machine, it is desirable that bills be printed only from those printing devices D which relate to insurance contracts upon which premiums are due in a particular month, and therefore, as will hereinafter be described in detail, the anniversary month of the policy, the classification of the policy as annual, quarterly, or monthly, as well as the other controlling characteristics and data pertaining to each insurance contract are represented on each printing device D by identifying means such as tabs 15 disposed in proper identifying positions on the printing device relating to the respective contract. Furthermore, other special characteristics applicable to each insurance contract are in-

dicated as required on the related printing and control device by identifying means such as tabs 15, and among such special characteristics that may be thus indicated are the existence of a policy loan, or the necessity for a premium reduction.

While, in the form chosen for disclosure herein the invention is embodied in a machine for producing insurance premium notices S of the aforesaid character from and under control of individual printing devices D which are fed one by one through the machine, it will be evident, of course, that the machine of this invention may be utilized for producing other kinds of business instruments such as various forms of public utility bills, tax notices and the like.

As herein shown the machine of this invention comprises an upstanding frame 30 affording a table top 31 along which the sheets S are advanced for performance of the desired printing operations thereon. The sheets from which the bills are to be produced by the present machine are preferably supplied to the machine in a preprinted form, although under some circumstances it may be desirable to utilize a web feed mechanism which cuts the required sheets from a web and passes these individual sheets one by one through the machine. Where preprinted sheets are employed, such sheets are placed in the supply magazine 32 of a sheet feeder 33 which is mounted upon the right hand end of the machine as shown in Figs. 1 and 2 of the drawings, and which separates the sheets and advances the same by one into a sheet guideway 34 which extends along the table top 31 of the machine longitudinally thereof. The sheets are advanced along the guideway 34 by means including constantly operated belts 35 and 36, and in the course of such movement the sheets are brought to rest in successive positions beneath a platen P so that successive impressions may be made thereon from printing devices D which are advanced in succession through the machine and into printing position beneath the platen P. Upon completion of the desired number of printed impressions on a sheet S by the platen P, the sheet is further advanced along the guideway 34 and is passed through a rotary printing mechanism 40 that is supported on a bracket 41 at the left hand end of the machine frame 30 which prints selected other data upon the bills or sheets. After the rotary printing mechanism 40 has operated upon each sheet, the sheet is discharged into a sorting or classifying mechanism 50 where the bills are sorted in accordance with varying characteristics which may have been embodied in the bills in the course of the aforesaid printing operations, and the operator of the machine may then remove the bills from the machine and make such additional entries in the bills as may be indicated by the class or group into which they have been sorted.

The printing machine herein illustrated embodies many of the constructional features and arrangements included in the printing machine illustrated in the Gollwitzer Patent No. 2,002,773 and illustrated in the Hartley Patent No. 2,002,737, both patented May 28, 1935, and the sheet feeder 33 as herein illustrated may be of the form shown in the aforesaid Gollwitzer patent. This sheet feeder 33 is in such an instance driven from the main drive shaft of the printing machine in the manner illustrated in the aforesaid Gollwitzer patent, thereby to operate in the proper timed relation to the other mechanism of the machine. As shown in Fig. 1 of the drawings, the main drive shaft of the machine carries a fly wheel 52 on the rear end thereof, this fly wheel being driven from a main motor 54 of the machine through a suitable belted connection. The main shaft of the machine is connected as shown in the aforesaid Gollwitzer patent so as to drive a platen shaft 56 which extends longitudinally of the machine above the table top 31 and somewhat rearwardly of the sheet guideway 34 and during operation of the machine, the platen shaft is operated continuously.

The main drive shaft of the machine, as shown in the aforesaid Hartley patent and the aforesaid Gollwitzer patent, operates to drive a timing shaft corresponding to the shaft 84 of the aforesaid Hartley patent, that is included in the sheet feeder 33 at a reduced speed which is dependent upon the number of impressions which are to be printed upon each sheet S fed into the machine, thereby to feed a sheet to the sheet guideway each time the required number of impressions have been made on a sheet, and this timing shaft of the sheet feeder 33 operates in turn, as shown in the Hartley patent, to drive a cam shaft 60 which extends longitudinally in the machine above the table top and rearwardly of the sheet guideway 34. The cam shaft 60 is, in the present case, rotated in a one-to-one relation to the timing shaft of the sheet feeder 33, and operates to control the means for stopping the sheet at different positions along the sheet guideway so that impressions may be made thereon in proper positions. As herein shown such means comprise a plurality of stop fingers 61, 62 and 63 mounted intermediate their ends on a supporting shaft 64 and having their forward ends disposed within the sheet guideway at different positions therealong so that they may be dropped into position to stop the sheet S as it is moved along the guideway. The other or rear ends of the stop fingers 61, 62 and 63 are arranged to engage cams that are conventionally mounted and arranged on the cam shaft 60 in such a relation that stop fingers 61, 62 and 63 are rendered active in succession to stop the sheet in three different progressively advanced positions with relation to the platen P.

As the sheet S is released by the last stop finger 63, it is advanced along the guideway 34 and into the rotary printing unit 40. This rotary printing unit, as herein shown, is of the character disclosed in the patent to Kranz No. 1,946,217 patented February 6, 1934, and this printing unit includes an upper platen drum 70, and a cooperating lower printing drum 71 upon which the electrotypes or other printing means are secured. As disclosed in the aforesaid Kranz patent, the two drums 70 and 71 are rotated constantly during operation of the machine and such rotation of the drums in unison is accomplished through a pair of meshed gears 72 and 73, Fig. 5, which are meshed with each other and secured respectively to the drums 70 and 71. The lower one of the drums is driven by a bevel gear connection 74 from a vertical shaft 75 in substantially the same manner as in the aforesaid Kranz patent, and this vertical shaft 75 is driven through a bevel gear 76 from a horizontal shaft 77 which extends along the rear portion of the machine and it is in turn driven from the main platen shaft 56. The desired connection between the platen shaft 56 and the shaft 77 is afforded by a reduction gearing 78, Fig. 3, which is in the present case arranged so that the shaft 77 is rotated in a one-to-three

relationship with respect to the main platen shaft 56. The bevel gear connection 74 and 76 are each arranged in a one-to-one relationship so that drums 70 and 71 of the rotary printing unit 40 are operated through one cycle of operation for each three operations of the platen P.

As disclosed in the aforesaid Kranz patent, the drums 70 and 71 are arranged for separating movement in the event that a sheet is not fed into position between the two drums, and such operation is attained in the present machine through the use of a sheet detecting means located in the sheet guideway 34 in the manner taught in the Kranz patent. As a sheet S passes through the printing unit 40 it is advanced into position between a pair of discharge rollers 79 so as to be advanced onto a sorting platform 80, Figs. 1, 2, 5 and 6 which forms part of the classifying mechanism 50. After the bill or sheet S has come to rest upon the platform 80, the platform 80 is tilted in one direction or the other laterally of the path of advancing movement of the sheet S, to thereby drop the bill into one or the other of a pair of collecting magazines 81 and 82, and under the present invention such selective disposition of the completed bill is accomplished automatically under control of the identifying means such as the tabs 15 carried upon the printing device from and under control of which such bill was produced. Therefore, the sorting of the sheets or bills is in accordance with the characteristics that have been imparted thereto by the printing means of the machine.

The printing devices D are supplied to the machine by depositing a group of such printing devices in a magazine 85 which is disposed somewhat rearwardly of the printing position in an upstanding relation with respect to the table top of the machine. The printing devices D are arranged or stacked in the magazine 85 so as to be positioned one upon another, and the machine is provided with printing device advancing means which is operable to withdraw the lowermost printing device D from the magazine 85 and to advance the printing device in a step by step manner forwardly along a print device guideway 86, Figs 4, 10, 11 and 13, which includes a sensing position II and a printing position III. Each printing device D comes to rest first at sensing position II and then at printing position III and is thereafter discharged forwardly and downwardly and into a collecting means such as a conventional galley or collecting drawer.

The printing device advancing means employed in the present machine is of general character disclosed in the patent to Gollwitzer No. 2,002,771 patented May 28, 1935, in that an eccentric 90, Fig. 4, mounted on the main platen shaft 56 is arranged to operate a plunger 91 which may be clutched, by means of a hook 92, to a rocker 93 which imparts advancing movement to the other elements of the printing device advancing means. The plunger 91 is slidably embraced by a sleeve 92' pivoted at 93' on the rocker 93, and it is upon the sleeve 92' that the hook or pawl 92 is pivoted. In order that the printing device advancing means may be rendered inoperative or inactive, the hook or pawl 92 must be disconnected from the plunger 91, and this is accomplished in the present machine in the manner disclosed in the patent to Hartley No. 2,002,737 patented May 28, 1935. Thus, as shown in the aforesaid Hartley patent, a cam shaft 95 is provided which controls engagement of the connecting pawl 92 with the plunger 91, thereby to control operation of the printing device advancing means. In the present instance the pawl 92 is normally urged toward an active relation by a spring 96, but is normally held disengaged by a rocker 97 that has a cam surface 97' thereon engaging a pin 97'' on the pawl 92. When the pawl 92 is to be engaged with the plunger 91, a cam lobe of a cam 98 on the cam shaft 95 acts through a roller 99 and a lever 100 mounted on the rocker 97 to shift the rocker 97 to an inactive position as explained in the aforesaid Hartley patent. This allows the connecting pawl 92 to engage the plunger 91 and the printing device advancing means are therefore operated through an advancing cycle.

The cam shaft 95 is in the present instance mounted in alignment with the horizontal shaft 77, Fig. 3, and is connected directly thereto so as to be rotated by the shaft 77 in a one-to-one relationship thereto. Thus the cam shaft 95 operates through one revolution each time the printing unit 40 operates through a printing cycle, and because of the relation of the printing unit 40 to the platen operating shaft 56, it will also be apparent that cam shaft 95 operates through one revolution for each three operative strokes of the platen P.

When a printing device D has been advanced from the magazine 85 and into sensing position as shown in Fig. 10 of the drawings, the identifying means afforded by the tabs 15 are sensed in order that the certain automatic functions in the machine may be controlled in subsequent cycles of operating of the machine. This is accomplished by a sensing head 101 which is supported for vertical movement over the guideway 86 of the printing device advancing means. The sensing head 101 is disposed above and in spaced relation to a stationary guide plate 102, Figs. 10 to 13, that spans the guideway 86, and the sensing head 101 is in the present instance guided for vertical movement by a pair of guide studs 103 that project upwardly from the plate 102 and extend with a snug sliding fit through bores 104 in the sensing head 101. Relatively large washers 105 on the upper ends of the studs 103 are held in place by screws 106 threaded into the studs, and thus upward on retracting movement of the sensing head 102, that is induced by springs 107, is limited. Downward movement of the sensing head 101 is in the present case effected by a pair of arms 108 which are fixed adjacent opposite ends of a rock shaft 109, so that the ends of the arms 108 bear on the respective heads of a pair of adjustable pressure studs 109' mounted in upstanding relation in the top of the sensing head 101. Thus, when a printing device D is in a position beneath the sensing head 101, the arms 108 may be actuated to move the sensing head 101 in a downward direction through an operative sensing stroke against the force of the springs 107. This is accomplished in the present instance through the use of the cam shaft 95, Fig. 12, which has an operating cam 110 fixed thereon. This cam 110 has but a single lobe since it is necessary that the sensing head 101 be operated but once with respect to each printing device, but it will be observed that in the present machine each printing device remains in a sensing station throughout three operative cycles of the platen P. The cam 110 is arranged to act upon a roller 111 mounted on the end of an arm 112 which is fixed to the rock shaft 109. Thus, when the lobe of the cam 110 engages the roller 111, the sensing head 101 is shifted down-

wardly through an operative sensing stroke with a relatively gradual movement, and when the sensing function of the sensing head 101 has been accomplished, the roller 111 rides off of the lobe of the cam 110 and may move rapidly toward the axis of the cam along an abrupt surface 110' of the cam lobe.

In the present machine the platen P is operated and controlled in substantially the same manner as in the aforesaid Hartley Patent No. 2,002,737, and the Gollwitzer Patent No. 2,002,773. Thus, as shown in Figs. 1, 2, 4 and 20, the platen P is supported upon a rigid arm 115 which is mounted for rocking movement about a pivotal axis 116, and the arm 115 has means thereon including a roller 117 which cooperates with a cam 118 on the shaft 56 so that when the cam is rotated through a complete revolution, the platen P is operated through a printing stroke. The cam 118 is loosely mounted up on the main platen shaft 56 and is arranged to be clutched to the shaft 56 by one revolution clutch means which includes a disc 119. The disc 119 is fixed upon the main platen shaft 56 so as to rotate therewith and a clutch pawl 120, pivotally mounted thereon, is spring urged by a spring 121 toward an active position wherein the inner end thereof will engage a lug 122 formed integrally with the cam 118. Thus when the clutch pawl 120 is engaged with the lug 122, the platen P will make one impression for each revolution of the main platen shaft 56. In the event that a particular printing device D is to be skipped, the clutch pawl 120 is disengaged, and this is accomplished by mechanism which is generally similar to that shown in the aforesaid Hartley Patent No. 2,002,737 and the Gollwitzer Patent No. 2,002,771. Such mechanism includes a release pawl 125 which is afforded on a rocker 125' and may be rocked to such position as to engage the outer end of the clutch pawl 120 to disengage the same, and the release pawl 125 is operated in each cycle of operation of the printing device advancing means by means including an operating rod 126. Thus a spring 125A acts on the rocker 125' to urge the same to the position of Fig. 4, and the rod 126 projects slidably through a bearing 126A on the sleeve 92' and has a nut 126B thereon in position to be engaged by the bearing 126B when the sleeve 92' moves upwardly in the course of a printing device operation. Hence the rocker 125' is positively actuated in a clockwise direction in Fig. 4, and is urged in a return or counter-clockwise direction by the spring 125A. And such operation takes place only in those cycles of operation wherein the printing device advancing movement is to take place. A rocker arm 127, having a tooth 128 thereon, is so associated with the rocker 125' that whenever the release pawl 125 is shifted into its operative position, the tooth 128 is shifted into such position that it may be engaged by a tooth 130 on a latching member 131. The latching member 131 is mounted for rocking movement on an axis 132 and may be shifted between active and inactive position by a selector rocker 133 which has a yielding connection with the latching member 131.

In the present machine the selector rocker 133 is operated in a manner which is different than in the aforesaid Hartley and Gollwitzer patents, in that an operating rod 134 is extended downwardly from an arm 135 of the selecting rocker 133, and the rod 134 is connected to the armature of an operating solenoid 136 which is disposed somewhat beneath the table top 31 of the machine and on the main frame thereof. The latch member 131 has a leaf spring 137 connected thereto so that a tooth 138 carried on one end of the spring rides against a head 139 on the end of the selector rocker 133. The selector rocker 133 is normally urged toward the position shown in Fig. 4 of the drawings by a spring 133A so that the tooth 138 is seated in a notch in the head 139, and under such conditions the latching member 131 is normally ineffective, and hence the clutch pawl 120 is normally engaged and the platen P is normally operative in each cycle of operation of the main platen shaft 56. When, however, a printing device D is to be skipped, the solenoid 136 is energized as will hereinafter be explained so as to shift the selector rocker 133 in a counter-clockwise direction as viewed in Fig. 4, and when this is done the tooth 138 is forced out of the notch in the head 139, thereby to render the latching member 131 active to set or hold the release pawl 125 in such position that as the next cycle of operation of the platen is nearing completion, the clutch pawl 120 will be disengaged and the platen P will be maintained in its inactive or elevated position. The latch 131 is thus rendered active only when a printing device D is to be skipped, and in this connection it will be observed that the latch 131 is, in such an event, rendered active in the cycle of rotation of the platen shaft 56 in which the printing device advancing means is to be operated, thereby to cause the clutch pawl 120 to be disengaged while the skip printing device is located at printing position. The rocking movements of the rocker 133 are limited by a pin 135A that may engage with one side or the other of an opening 135B in the adjacent frame. In the present machine wherein three impressions are normally made on each sheet from a printing device D at a printing position, the inactive condition of the platen P is maintained for three cycles of operation of the platen operating shaft 56, thus enabling other operations which are to be performed upon the preceding sheet or bills to be completed in the normal manner. This controlling action results from the fact that the latch 131 is hook-like in character so as to remain effective until such time as the rocker 125 is again actuated, and this takes place only when the printing device advancing means are operated. Thus the rocker 125 is maintained in its counter-clockwise position throughout three cycles of the platen shaft 56 whenever a printing device is to be skipped, and this characteristic is utilized in the manner described in the aforesaid Hartley patent to suspend the operation of the sheet supply means 33 and the stop finger mechanism. Thus the rocker 125' extends to the right as shown in Fig. 2 and has a control roller 125B thereon that acts, when the rocker is held in its counter-clockwise position as viewed in Fig. 4, to disengage a clutch corresponding to the clutch 44 of the aforesaid Hartley patent. This suspends the operation of the sheet supply means 33 and the stop finger cam shaft 60, in the manner disclosed in said Hartley patent.

In addition to the print-skip control of the platen P in the manner just described, additional controls are afforded for a portion of the platen P in order that the data M may be omitted from selected of the bills when this is required. In accomplishing this result, the platen P is made in two sections, one section P1 of which is stationarily mounted with respect to the supporting arm 115 of the platen, such mounting being be-

neath a rigid mounting plate 150. It is the section P1 of the platen P that prints the data 17, 18 and N on the bill S, while the data M is printed upon the bill by the separate platen section P2 which may be termed a receding platen section. The receding platen section P2 is disposed beneath one end of the mounting plate 150 and is urged to an upper or retracted position by springs 152, and a pair of spaced cam shafts 154 are mounted in the lower face of the plate 150 so that upon rocking movement of the two cam shafts 154, the platen section P2 may be moved downwardly toward its active position against the retracting force of springs 152. Two cam shafts 154 are operated in unison by arms 156 and 157 which are connected to the rear ends of the two cam shafts 154 and are connected together by a link 158. The arm 157 is in the nature of a relatively large plate which extends to the right, as shown in Fig. 19, beyond the end of the mounting plate 150, and a spring 160 urges the arm 157 and the two associated cam shafts 154 into position shown in Fig. 21. In Fig. 21 the platen section P1 is shown in its lower position while the platen section P2 is retracted, and as an incident to the upward movement of the platen P, the platen section P2 is restored to its active position of Fig. 19. This is accomplished by an abutment bar 162 which extends towardly from a mounting bracket 164 mounted on a stationary portion of the upper housing of the machine, and the abutment bar 162 extends downwardly so that its lower end is disposed over a forwardly extending roller 166 mounted on the plate 157. Thus when the platen P is raised from the position shown in Fig. 21 to the position shown in Fig. 19, the engagement of the roller 166 with the lower end of the abutment bar 162 will rock the cam shafts 154 in a clockwise direction to the relationship shown in Fig. 19, thereby to move the platen section P2 to its lower or operative relationship.

When a situation arises in which the platen section P2 is to be receded or rendered inactive, means are rendered effective upon the arm 157 to return the arm in a counter-clockwise direction from the position of Fig. 19 to the position of Fig. 21, and this takes place as an incident to the downward movement of the platen P. This is accomplished through the provision of shiftable stop means adapted to be disposed beneath and in the path of a tooth 168 formed on the extending portion of the arm 157 as shown in Figs. 19 and 21. The shiftable stop means as herein shown are afforded by a vertically extended lever 170 which is pivotally mounted intermediate its ends on a pivot 172 carried by the bracket 164. The lower end of the lever 170 has a laterally extended stop member 174 secured thereon in such position that it may be alternatively disposed beneath the tooth 168 as shown in Fig. 20, or may be disposed forwardly, or to the right of the tooth 168 as viewed in Fig. 20, so as to be out of the path of downward movement of this tooth. The normal position of the stop carrying lever 170 is such that the stop member 174 is disposed in an inactive position forwardly or to the right of the tooth 168 as viewed in Fig. 20, such normal position being established in the present instance by a cam 176 mounted on the stop finger cam shaft 60. This cam 176 has a single lobe which is adapted to engage a roller 178 mounted on a link 180. The link 180 is pivoted at its forward end on lower end of the lever 170, and is bifurcated at its rear end so as to slidably embrace the cam shaft 60, and the arrangement is such that each time a new sheet S is to be fed into the sheet guideway 34 of the machine, the lobe of the cam 176 will engage the roller 178 and return the stop 174 to its forward position in the event that this stop has been operative in the preceding machine cycle. The lever 170 is illustrated in Fig. 20 as being in its operative position, and when such a position of the stop 174 is to be effected, this may be done by energization of a solenoid 182 which has its armature 184 connected by a link 185 to the upper end of the lever 170. The solenoid 182 is of such a character that when it is energized, the link 186 is moved in a right hand direction as viewed in Fig. 20. The lever 170 is maintained in one or the other of its positions by a yieldable latch mechanism 186 which has two positions in which it may act upon a pin 188 fixed on the lever 170.

Thus, through control of the receding platen section P2, the printing of the data M on the sheet or bill may be prevented in those instances where this is desirable, and upon such bills it is often desirable to print special data that constitutes additional text, such for example as the text 21 shown in Fig. 24 of the drawings. This text is desirable where the bill is to include a statement of interest due upon a premium loan. Such additional text is, in accordance with this invention, selectively included in the bills produced by the machine through the use of means included in the rotary printing unit 40. Thus, as shown in Figs. 15 to 18 of the drawings, the lowermost drum 71 of the rotary printing unit has electrotypes 200 and 201 secured on the annular mounting rails 203 thereof so that the text of such printing means 200 and 201 may print the variable data V on the sheets S as they pass through the machine, such variable data V are ordinarily changed only after a comparatively long run of bills which pertain to a particular group or agency, but during the entire period of such run, the printing means 200 and 201 are effective to print the data V upon each of the bills produced by the machine. Additional printing means 204 comprising electrotypes or the like are also secured upon the mounting rails 203 so as to print the month and the year as indicated at 18 in Fig. 22 upon each bill which is produced in the machine in a particular run thereof. Since the sheet S includes three sections upon which the date is to appear, there are three printing means 204 secured on the drum 71 at proper spaced intervals thereabout.

In respect to the printing of the additional text 21 upon selected of the bills or sheets S, means are provided on the drum 71 for printing such text, and these means are arranged to be rendered active or inactive selectively in accordance with the character of the bill which is being produced in a particular cycle of operation of the machine. Thus, as shown in Figs. 15 and 16, the drum 71 has a recess 206 in which a mounting block 208 is mounted for generally radial movement on guide studs 210. Spring means 211 act between the studs 210 and the mounting block 208 to urge the mounting block in an inward direction toward an inactive position shown in Fig. 15 of the drawings. The mounting block 208 has printing means such as an electrotype 214 secured thereon as by screws 216, Fig. 17, and the type characters or text 218 on the electrotype 214 are so disposed that when the mounting block 208 is in its inner or inactive position, the type faces of the electrotype 214 are disposed inwardly of the cylindrical printing surface of the

drum 71, as shown in Fig. 15. This cylindrical printing surface is of course determined by the surfaces of the printing means 200, 201 and 204, and in addition, a substantially continuous cylindrical surface is provided by a bearer rail 220 which is secured about the drum 71 as shown in Figs. 15 and 16 in such a position that it may provide for continuous contact with the sheet S as the sheet passes between the drums of the rotary printing unit.

In the present instance mounting block 208 is normally located in its retracted position, and when an impression is to be made from the electrotype 214, the mounting block 208 is moved in an outward radial direction to its active position of Fig. 16 wherein the type faces 218 of the electrotype 214 are disposed in the cylindrical printing surface of the drum 71, as shown in Fig. 16, whereby an impression 218' will be formed on the section 53 of the bill as shown in Fig. 24. This is attained in the present instance by a pair of spaced cam shafts 222 which have arms 223 and 224 connected to corresponding ends thereof as shown in Fig. 16 of the drawings. These arms 223 and 224 are connected by a link 225 for operation in unison, and means are provided whereby these arms may be actuated in the course of rotating movement of the drum 71 to move the mounting block 208 back an forth between its two positions. In accomplishing this the arm 224 is made in the form of a triangular plate and has a roller 226 mounted thereon so that in the rotation of the drum 71, the roller 226 may be engaged and actuated to produce the desired movement of the mounting block 208. In the event that the mounting block 208 is in its outer or active position, the roller 226 is arranged to strike a restoring cam member 228 after the electrotype 214 has moved through the upper or impression position as indicated by the dot-dash outlines in Fig. 16, and this rocks the connected levers 223 and 224 so as to rotate the cam shafts 222 from the position shown in Fig. 16 to the position shown in Fig. 15, thereby to cause the mounting block 208 and the electrotype 214 to be retracted. The mounting block 208 remains in this retracted position until it is again desired to print an impression from the electrotype 214, and when this is to be done, the roller 226 is engaged by means that act in an opposite manner so as to move the roller in an inward direction and thereby return the cam shafts 222 to the position shown in Fig. 16. As herein shown the means for accomplishing this result comprise a bell crank 230 which is pivotally mounted at 231 and is adapted for rocking movement between an inactive position determined by a stop pin 232 and an active position determined by a stop pin 233. The bell crank 230 is urged toward its inactive position by a spring 234, and when it is desired to shift the bell crank 230 to its active position, the desired movement is imparted thereto by a solenoid 236 which has its armature connected to one arm 238 of the bell crank 230. The other arm of the bell crank has an abutment member 240 formed thereon so as to provide a cam surface 242, and when the bell crank 230 is shifted into its active position as shown in Fig. 16 of the drawings, this cam surface 242 is disposed in the path of the roller 226, and when the roller engages the cam surface 242 the roller is shifted in an inward direction to the relationship of Fig. 16. This so operates the cam shafts 222 that the mounting block 208 and the electrotype 214 are shifted outwardly and the type faces of the electrotype are located in proper position to make an impression as the rotating movement of the drum 71 is continued. The bell crank 230 and its cam surface 242 are so positioned that the outward shifting movement of the electrotype 214 is completed before the electrotype reaches the inking means 245 of the machine, and as will be clear from Figs. 15 and 16, the type faces of the electrotype 214 will be in their proper position to be inked before they reach the first of the two inking rollers 245 which are fragmentally shown in Figs. 15 and 16. Such inking rollers and their relationship to the other portions of the rotary printing unit are fully illustrated and described in the aforesaid Kranz Patent No. 1,946,217.

As the printed sheet is completed it is discharged through the discharge rollers 79 and onto the sorting platform 80 which is pivoted at 250 on a longitudinally extended pivot which is supported at its opposite ends on standards 251, Fig. 6. The standards 251 are mounted between the two magazines 81 and 82 on a supporting bed plate 252 which is in turn carried by the supporting bracket 40 so as to extend forwardly therefrom. The magazine 81 is in the form of an angular sheet metal member having a bottom wall and a side wall 253, and mounting brackets 254 on the outer surface of the side wall 253 are adjustably secured on vertical supporting posts 255 by wing nuts 256 extended through the brackets 254. The magazine 82 is similarly formed so as to afford a side wall 257 and brackets 258 on the side wall 257 are similarly secured on upstanding posts 259 disposed on the mounting plate 252 adjacent to the rear edge thereof.

The tilting of the sorting platform 80 selectively in opposite directions and in proper timed relation is, in the present instance, accomplished through cam mechanism 260 which is disposed rearwardly of the posts 259 and is operatably connected to the platform 80. Such connection in the present instance comprises a link 261 extended downwardly from the platform 80, the link being connected to the platform forwardly of the pivot 250. The lower end of the link is connected to one arm of a bell crank 262, Fig. 6, which is pivoted on one of the standards 251 by a pivot 263. The bell crank 262 in the present instance formed by a triangular plate and the other arm of the bell crank has a link 264 connected thereto and extended rearwardly beneath the magazine 82. The rear end of the link 264 is connected to the lower end of a lever 265, the upper end of which is pivoted on a shaft 266 extended between the arms of a U-shaped bearing bracket 267 carried on the mounting plate 252. The lever 265 has its lower end urged in a rearward direction by a spring 268' so that a roller 268 on the arm 265 is urged into engagement with the surface of an operating cam 269. The operating cam 269 is fixed upon a cam shaft 270 mounted in the arms of the bracket 267 and which is operated, as will hereinafter be explained, through one revolution each time a bill is produced by the machine, or in other words, this cam shaft operates in a one-to-one relationship to the horizontal shaft 71 and the printing unit 40. The cam 269 has a receding surface 271 formed thereon so that in the course of operation of the cam 269, the lever 265 will be rocked in a rearward direction, or in other words, in a right hand direction as viewed in Fig. 6 so as to operate through the connecting linkage to tilt the sorting platform 80 in a counter-

clockwise direction, or to the left as viewed in Fig. 6. When this is done, the completed bill carried on the platform 80 will drop off of the platform and into the magazine 81. Such operation constitutes the normal operation of the sorting mechanism, and the completed bills are therefore normally deposited in the magazine 81.

In those instances, however, where the bill has been modified so as to print the additional data 21 thereon, or so as to eliminate the printing of the data M, such bills constitute special bills upon which further work must be performed, and these special bills are deposited in the magazine 82 by rocking the platform 80 in a clockwise direction, or to the right as viewed in Fig. 6. Such clockwise rocking movement of the platform 80 is accomplished by another cam 275 which is loosely mounted on the cam shaft 270 and is adapted to be clutched thereto by one revolution clutch 276. The one revolution clutch 276 includes a stop member 277, Figs. 5 and 9, which is adapted to engage a clutch pawl 278 to disengage the same from an appropriate notch 278' in a driving member 279 of the clutch. This driving member 279 is fixed upon the shaft 270, and when the stop member 277 is shifted about its supporting axis 280 so as to release the pawl 278, the pawl engages the driving member 279 so that the driven member of the clutch and the associated cam 275 are driven through one revolution.

It will be observed that the cam 275 remains stationary in normal cycles of the machine and the cam 275, therefore, has a recess 281 formed therein to afford clearance for movement of the roller 268 in a right hand direction, Fig. 6, during normal machine cycles. When the stop lever 277 is released, the cam 275 rotates with the cam 267, but the cam 275 has an extended lobe supersedes the cam 269 and which acts upon the roller 268 so as to rock the lever 265 to the left as viewed in Fig. 6. This movement of the lever 265 acts through the connecting linkage to rock the platform 80 in a clockwise direction, or to the right, to thereby deposit the completed bill in the magazine 82. After the bill has had an opportunity to drop from the platform 80, the cam 275 restores the platform to its horizontal position of Fig. 6. The stop lever 277 is fixed upon the shaft 280, and an arm 282 fixed on the other end of the shaft 280 is connected by a link 283 to the armature of a solenoid 284 so that by energization of the solenoid 284, the stop lever 277 may be released and the cam 275 may be rendered operative.

The cam shaft 270 is in the present instance driven from the horizontal shaft 77, and for this purpose a shaft 286 is extended from the shaft 77 in a co-axial relationship to the left as viewed in Fig. 1, and upon the printing unit 40, this shaft has a bevel gear connection 287 with a vertical shaft 288 which extends downwardly to a bearing 289 carried on the bracket 267 just above the cam shaft 270. The shaft 288 has a bevel gear connection 290 with the adjacent end of the cam shaft 270. The bevel gear connections 287 and 290 each have a one-to-one relationship so that the cam shaft 270 is driven in a one-to-one relationship with the horizontal shaft 77.

In accordance with the present invention the control of the operation of the platen P, the receding action of the platen section P2, the operation of the receding section of the drum 71, and the operation of the classifying mechanism 50 are all controlled by identifying means carried upon the printing devices D, and since such identifying means are sensed at the sensing station of the machine, and the elements of the machine which are to be controlled in accordance with such sensing become operative one or more cycles after the sensing of such identifying means, the present invention provides storage means for delaying the effectiveness of the sensing operation and assuring operation of the various elements of the machine in the proper timed relationship.

Such storage means, as herein shown, are included within a housing 300, Figs. 1, 2 and 5, supported at one end by bracket 301 from a portion of the frame of the printing unit 40 and supported at the other end by a standard 302 extended upwardly from the supporting plate 252. The storage mechanism included within the housing 300 has a drive shaft 305 extending horizontally through the housing and supported by mounting brackets 306, 307 and 308 which are included within the housing 300 thereof, and this shaft is driven from the shaft 286 through a six-to-one reduction gearing 309 shown in Fig. 5 of the drawings. Thus the shaft 305 makes by one revolution for every six complete cycles of operation of the machine. The shaft 305 has three storage members 310, 311 and 312 mounted thereon for rotation with the shaft, and these storage members 310, 311 and 312 are generally similar in construction in that each storage member has six equally spaced arms 313 formed thereon. Each such arm 313 has a storage plunger 315 mounted therein for sliding movement parallel to the mounting shaft 305, and in such movement each such storage plunger may be shifted to an active position or to an inactive position. Thus each of the storage members 310, 311 and 312 has six such storage plungers which are shown in Fig. 5 as being in their inactive positions. The shaft 305 is driven in the direction indicated by the arrows in Figs. 6, 7 and 8 and in the course of such movement the storage plungers 315 of the three storage members are moved past restoring cams 316 which are associated respectively with the storage members 310, 311 and 312 and which operate to move the storage plungers 315 thereof to their inactive positions in the event that they have previously been positioned in their active positions. As will be evident in Fig. 5 of the drawings, the storage member 310 is disposed to the left of the supporting bracket 307, and the associated restoring cam 316 which is to operate upon the storage plungers 315 of the storage member 310 is accordingly mounted on the adjacent or left hand face of the mounting bracket 307 so that the restoring movement of the storage plungers of this storage member is to the left. After a particular storage plunger has moved past the restoring cam 316, so as to be located in its inactive position, this storage plunger, in the continued rotation of the shaft 305 is moved into a setup position of the drum, and while the storage plunger is so located, the storage plunger may be shifted to its active or setup position. In the present instance this is accomplished through electrically operated means such as a solenoid 320 which is supported by a bracket 321 beneath the upper wall of the housing 300. The solenoid 320 is so located that it is disposed directly over the shaft 305, and hence in the present embodiment, a storage plunger 315 on the member 310 may be set up when such plunger is at the upper location on the storage member, or in other words, when it is located directly above the shaft 305 and in alignment with the armature of solenoid 320.

The storage member 311 is located in a similar position on the shaft 305 and to the left of the

bracket 308, and the restoring cam 316 for this storage member 311 is similarly located on the left hand face of the bracket 308 as viewed in Fig. 5. A similar actuating solenoid 325 is suspended from the upper wall of the housing 300 by a bracket 326 so that a storage plunger 315 on the member 311 may be set up by energization of the solenoid 325 when such storage plunger moves through the uppermost position on the storage member 311.

The storage member 312 is mounted on the end of the shaft 305 just to the right of the bracket 308 as viewed in Fig. 5, and the restoring cam 316 which pertains to this storage member is located on the right hand face of the bracket 308. A similar actuating solenoid 328 is supported by a bracket 329 from the bracket 308 so that when the solenoid 328 is energized, the aligned one of the storage plungers 315 in the storage member 312 may be actuated to the left as viewed in Fig. 5 and into an active position.

In the present embodiment of the invention the storage member 310 is arranged to control the print-skip operation of the machine, and a normally open spring type switch 330, Figs. 5 and 6, is supported on the mounting bracket 307 in such position that an actuated or active storage plunger 315 of the storage member 310 may engage a cam 331, Fig. 6, on one of the switch members to close the switch 330. The location of the cam 331 in an angular sense about the shaft 305 is such that the switch 330 is closed as will hereinafter be described in detail during the cycle of operation of the platen mechanism which immediately precedes the cycle in which a particular printing device D is to be advanced into printing position. The switch 330 is arranged to close the energizing circuit to the solenoid 136 so as to render the platen mechanism inoperative in the next cycle of the machine, and therefore, the switch 330 is closed only when a particular printing device is to be skipped. In order that this may be accomplished, the setup solenoid 320 of the storage member 310 is energized when the identifying means of a particular printing device indicate that this printing device is to be skipped. The energization of the solenoid 320 is, therefore, under control of the sensing mechanism which will hereafter be described in detail.

The storage member 311 is, in the present instance, arranged to control the receding platen P2 as well as the sorting platform 80, and for this purpose normally open switches 335 and 336, Fig. 7, are disposed in appropriate positions on the left hand face of the mounting plate 308 as viewed in Fig. 5 of the drawings, the angular disposition of such switches about the axis of the shaft 305 being illustrated in Fig. 7 of the drawings. The solenoid 325 which acts to set up the plungers 315 of the storage member 311 is also arranged to be energized under the control of the sensing mechanism, and when such a storage plunger has been set in its active position, this storage plunger is first effective to engage a cam member 337 on one of the members of the switch 335 to close the switch 335. This takes place at the beginning of the cycle in which the related printing device is located at a printing position, so that when the platen P is again operated in a downward direction, the platen P2 will be actuated to its receded position. The stop means 174 which causes the platen P2 to be receded is maintained active by the latch 186–188 for three cycles of operation of the platen P so that the impressions made upon the three sections of the bill are the same.

After such a storage plunger 315 has passed the switch 335 it moves toward the switch 336, and the storage plunger reaches and engages a cam member 338 on one of the members of the switch 336 so as to close the switch at the time when the completed bill has been discharged on to the platform 80. Thus the switch 336 is connected to the solenoid 284 so that when the switch 336 is closed, the solenoid 284 will release the one-revolution clutch 276 and cause the cam 275 to be operated.

The storage member 312 is in the present case arranged to control the operation of the receding section 208 of the drum 71, and a storage plunger 315 is arranged to be actuated to its active position whenever the text carried by the receding section 208 of the drum is to be printed upon a bill. To this end a normally open switch 340 is mounted on the right hand face of the bracket 308 as viewed in Fig. 5, with the switch located in the angular relationship to the shaft 305 which is shown in Fig. 8 of the drawings. When a storage plunger 315 of the storage member 312 is actuated to its active position, it is arranged to engage a cam member 341 on one of the members of the switch 340 to close the switch at the time when the related bill is being advanced from the last stop finger 63 toward the printing drum 71. Hence, when this bill has reached the printing drum, the receding section 208 of the drum 71 will have been forced outwardly and will be in a position to make an impression 218' upon the bill, Fig. 24, as it passes through the rotary printing unit 40.

When a printing device D is to be sensed by the operation of the sensing head 101, it is essential that the printing device be accurately located at sensing station II, and in order that this may be accomplished, positioning means are provided at the sensing station for engagement by the leading edge of each printing device D as such printing device is moved into sensing position. As shown in Figs. 10 to 12, such positioning means comprise a pair of arms 350 pivoted on the table top 31 of the printing machine on a pivot 351 so that the arms 350 project in a rearward direction toward sensing station. In the present case the two arms 350 are formed as the arms of a bail, the cross member 352 of which is disposed at substantially the position that should be occupied by the leading edge of each printing device when it is located at sensing station. The transverse member 352 has a stop plate 353 secured thereon by bolts 354 so that when the arms 350 are in their lower position, this stop plate 353 will be disposed in an accurately located position in the printing device guideway 86, as shown in Fig. 11 in the drawings, and when the stop plate 353 is so positioned, the forward edge of the printing device D will engage the stop plate so as to accurately stop the movement of the printing device D and therey dispose the same accurately in the sensing position.

The stop plate 353 is raised and lowered in timed relation to the operation of the printing device advancing means, and the mechanism for attaining this operation is best illustrated in Figs. 10 and 12 of the drawings. Thus a spring 354 normally acts on one of the arms 350 to urge the arms and the stop plate 353 toward an upper or inactive position, and means are associated with the rocker of the printing device advancing means for controlling the position of the stop plate 353 so as to move the same to a lower position whenever a printing device is being moved into sensing station. Thus the rocker upon which the arm 93,

Fig. 4, is mounted also has an arm 355 mounted thereon as shown in Figs. 10 and 12, and this arm is operatively associated with mechanism for effecting the required movements of the stop plate 353. As herein shown, such means comprise a rocker 356 in the form of a sleeve that is freely mounted for rocking movement on the shaft 60, and this rocker 356 has an arm 357 at one end thereof to which an operating link 358 is pivotally connected. This operating link extends toward the upper end of the arm 355 and has a slot 359 therein that embraces and is guided upon a stud 360 mounted on the end of the arm 355. The other end of the rocker 356 has an arm 361 formed thereon, and this arm 361 has a laterally projecting stud 362 disposed near the end thereof so that this stud is located in a cam slot 363 formed in a cam plate 364 secured on the adjacent arm 350. The cam slot 363 is disposed at such an angle that when the rocker 356 is moved in a counter-clockwise direction to the position shown in Fig. 12, the stud 362 will ride along the cam surface 363 so as to force the arms 350 in a downward direction and thereby render the stop plate 353 active. When the rocker 356 is moved in a clockwise direction from the position shown in Fig. 12, the stud 362 is moved downwardly along the cam surface 363 to thereby release the arms 350 for upward movement, and this causes the stop plate 353 to be lifted out of the printing device guideway. The upward movement of the stop plate 353 is limited by engagement of a shoulder 363A of the cam slot with the stud 362.

The necessary rocking movements are imparted to the rocker 356 through the link 358, and by reason of the pin and slot connection 359—360, such rocking movements, of the rocker 356 take place in the desired timed relation to the operation of the printing device advancing means. In this connection it will be recalled that when the arm 93 and the arm 355 move in a clockwise direction, the printing device advancing means remains stationary, as do the various printing devices in the printing device guideway 86, and at substantially the end of such idle movement of the arm 355, the stud 360 engages the right-hand end of the slot 359, as viewed in Fig. 13, to thereby rock the rocker 356 in a clockwise direction, and this causes the stop plate 353 to be elevated. Hence, during the counter-clockwise movement of the arm 93 and the arm 355, the stop plate 353 is in its elevated position and the printing devices may pass freely thereunder. Near the end of the active stroke of the printing device advancing means, the stud 360 strikes the left-hand end of the slot 359, as viewed in Fig. 12, thereby to rock the rocker 356 in a counter-clockwise direction and move the stop plate 353 into its lower or active position in time to enable the leading edge of the printing device D to engage the stop plate as the forward or active stroke of the printing device advancing means comes to an end. The printing device D is therefore accurately positioned at the sensing position so that the sensing means may be operated to sense the identifying means afforded by one or more tabs 15.

The sensing of the identifying means is in the present instance effected through the use of means that include the sensing head 101 and a plurality of normally open switches 370, Figs. 10, 14 and 27, and to enable a large number of identifying positions to be sensed within the relatively limited area afforded along the upper edge of the printing device D, the switches 315 are arranged in a remote relationship with respect to the sensing head 101 and operative connections are afforded between the sensing means on the sensing head 101 and the respective switches 370.

In the present embodiment of the invention, the printing devices D are provided with 12 mounting sockets 371, as will be evident in Figs. 23 and 25 of the drawings, and through the use of notched tabs 15, which afford two possible sensing positions for each tab, the printing devices D are thus provided with 24 possible identifying positions that may be used selectively and in various combinations to impart different identifications thereto. Thus it is necessary to provide twenty-four switches 370 to care for the sensing operations that may be performed in relation to the printing devices shown in Figs. 23 and 25, and for convenient mounting and construction, these switches are mounted in two groups of twelve each that are disposed on opposite sides of the printing device guideway and relatively close to the sensing station as will be evident in Figs. 2 and 10. Thus, as viewed in Fig. 2, twelve switches are mounted in a switch box 373 on the left-hand side of the printing device guideway, while twelve switches 370 are mounted in a switch box 374 disposed to the right of the printing device guideway. The mounting of the switches 370 in the switch boxes 373 and 374 is substantially the same, and in Fig. 14 of the drawings, such mounting is shown in detail. Thus two supporting bars 375 and 376 are provided in the box 374, and six of the switches 370 are mounted on each of the two bars 375 and 376. The bar 376 is disposed somewhat lower than the bar 375 and somewhat to the right thereof as viewed in Fig. 14 so that the ends of the switches carried on the two bars will be disposed out of alignment, and with this arrangement, the switches of both rows of switches may be individually actuated by means extended downwardly through the top of the box 373. As hereon shown, such means includes a guide bar 377 having a stepped lower surface so as to afford surfaces 378 and 379 disposed respectively above and relatively close to the ends of the switches of the two rows, and operating pins 380 and 381 are mounted in suitable bores in the bar 377 so as to be disposed above the upper blades of the switches 370 of the two rows thereof. Thus by moving a selected one of the pins 380 or 381 in a downward direction, the related switch 370 may be closed, and such selective closure of the switches 370 it attained through Bowden cable connections extended to the various pins 380 and 381 from the sensing means of the sensing head 101.

The operative connections from the sensing head to the operating pins 380 and 381 are afforded by a plurality of Bowden cables 383 having sheaths 384 and cables 385. At the switch boxes 373 and 374, the cables 385 are connected to the upper ends of the pins 380 and 381, and the sheaths 384 of the Bowden cables are anchored in a crossbar 386, such sheaths being extended into bores in the bar 386 and being fixed in position by set screws 387. At their other ends, the Bowden cables 383 have the sheaths 384 thereof extended into bores in an anchoring bar 388 mounted on the top of the sensing head 101 as will be evident in Figs. 10 and 11, and the sheaths 384 are fixed in the bar 388 so as to prevent longitudinal movement of the sheaths with respect to the bar. It will be observed that the bar 388 is spaced upwardly from the upper face of the sensing head 101, and the cables 385 are extended downwardly through this space and through a stationarily mounted stripper bar 390 that is supported in this space by the studs 103,

as will be evident in Figs. 11 and 13. Beneath the stripper bar 390, the cables 383 are secured to the upper ends of sensing pins 391 that are slidably mounted in appropriate bores formed in the sensing head and in the plate 102. Thus when the sensing head 101 is moved downwardly, the sensing pins 391 may move downwardly and toward an upwardly facing groove 393 formed in a supporting plate 394 mounted so as to extend transversely of the printing device guideway 86. The supporting bar 394 is so arranged that when a printing device D is stopped in the accurate position determined by the stop plate 353, the tabs 15 of the printing device are disposed over the groove 393 in the bar 394 and beneath the sensing pins 391, and as the sensing head 101 is moved downwardly, any sensing pin that encounters a tab 15 will have its downward movement stopped by such tab. Where tabs 15 are not encountered, the sensing pins 391 will of course continue their movement downwardly into the groove 393. When the downward movement of a sensing pin 391 is thus stopped by engagement of such pin 391 with a tab 15, the continued downward movement of the sensing head with respect to such pin, causes the cable 385 associated with such pin to be moved through the sheath 384, thereby to impart downward movement to the associated operating pin 380 or 381 so as to cause closure of the related switch 370. When the sensing head moves upwardly, the pin 391 will of course strike the lower face of the stripper plate 390, and will be held in the position shown in Fig. 11 while the upward movement of the sensing head into bar 388 is completed. This causes the cable 385 to be, in effect, withdrawn in a downward direction from the sheath 384 as viewed in Fig. 11, thereby to withdraw the associated pin 380 or 381 in an upward direction to allow the related switch 370 to resume its normal open position.

In order that the controlling action of the selector upon the various mechanisms of the machine may be varied to meet the different situations that arise in the use of such a machine, the switches 370 are associated with the controlled mechanisms of the machine through the intermediary of a plug board 400 that is shown in Figs. 1 and 27 of the drawings. The plugboard 400 has a series of plug terminals allocated to the respective switches 370, and such plug terminals include a series of input terminals 401 and a series of output 402. The input and output terminals 401 and 402 are arranged in pairs so that each pair is allocated to a different one of the switches 370, and the pairs of input and output terminals 401 and 402, and the related switches 370 are identified by the same manner of identification as the corresponding identifying positions on the printing device D. Thus, as shown in Fig. 25, the twelve tab sockets 371 are identified by the numbers 1 to 12, and the two identifying positions afforded through the selective location of a notched tab in such a socket are identified as positions A and B respectively. Similar identifications have therefore been applied in the spaces beneath the two rows of plug terminals shown in Fig. 27, and have been applied to the various switches 370 in Fig. 27.

In the present instance each terminal 401 and 402 has two plug sockets 403, thereby to enable two plug connections to be made to any one of these terminals when this is desirable. The input terminals 401 are electrically connected to the respective switches 370, such connection being made to one of the contacts of each of these switches. Thus a connecting cable 405 has a plurality of wires 406 that are connected at the respective input plug terminals 1A to 6B inclusive, and the cable 405 is extended to the switch box 374 and the wires 406 thereof are extended from the cable 405 within the switch box and are connected to corresponding switch contacts of the switches 370 contained within this switch box. Similarly, a cable 407A has wires 407 extended therefrom and connected thereto to the respective output plug terminals 402 from the terminal 1A to 6B inclusive, the cable 407A is extended to the switch box 373 and the wires 407 are connected to the other switch contacts of the corresponding switches 370.

Similarly cables 408 and 409 have the wires thereof connected to the input and output plug terminals of the positions 7A to 12B inclusive, and these cables are extended to the switch box 373 so that the wires of these cables will be connected to the switches 370 included within this switch box. With the foregoing arrangement, the close of any selected switch 370 serves to complete a circuit from the related input terminal 401 to the related output terminal 402, and the closure of such a circuit is utilized to attain the desired controlling operation upon the controlled elements of the printing machine.

In attaining desired controlling action, the various input and output terminals 401 and 402 must be interconnected with the control mechanisms associated with the various parts of the printing machine, and in order that this may be conveniently accomplished, the plug board 400 also includes a plurality of other plug terminals identified by the reference characters 410 to 417 inclusive, and these plug terminals include varying numbers of plug sockets 418 as will be evident in Fig. 27 of the drawings. Thus the various plug terminals 410 to 417 are connected as will hereinafter be described in detail to various control elements of the printing machine, and by interconnection of the plug sockets 410 to 417 with appropriate ones of the input and output terminals 401 and 402, the sensing mechanism may be rendered effective in different ways to produce the desired cycle of operation of the machine under control of the identifying means carried on the printing devices D.

As will be evident in the wiring diagram afforded by Figs. 26 and 27, the operating power for the various electrically energized elements of the machine is supplied from a suitable power source 420 having line wires L1 and L2, the line wire L1 being extended to one terminal of the platen control solenoid 182 and branch leads 421, 422 and 423 being extended from the line wire L1 to one terminal of the print-skip solenoid 136, to one terminal of the insert control solenoid 236 and to one terminal of the solenoid 284 that controls the operation of the sorting platform 80. Another wire 424 is extended from the line wire L1 and is connected by a branch 425 to one terminal of a relay 426 this relay having normally open contacts 427. A further branch lead 428 is extended from the wire 424 to one terminal of a relay 429, this relay having normally closed contacts 430. A wire 431 extends from the wire 424 to one terminal of the solenoid 328, and a branch lead 432 from the wire 431 is connected to one terminal of the solenoid 325. Thus connections are afforded from the line wire L1 to most of the control elements of the printing machine, and completion of circuit through these elements and back to the line wire L2 is governed by the sensing

mechanism in association with a pair of timing switches 435 and 436 that are normally open and are arranged for closure by cams 437 and 438 that are mounted on the shaft 95 as shown in Figs. 3 and 10.

In attaining such control of the various control devices of the printing machine, the plug terminal 410 has a wire 440 extended therefrom to the other terminal of the solenoid 328, and this wire 440 has a branch lead 441 extended to the other terminal of the relay 428, and thus when the circuit is extended from the line wire L2 to the plug terminal 410 as will hereinafter be described, circuit will be completed through the relay 426 and through the solenoid 328. Thus the solenoid 328 will shift the aligned one of the storage pins of the storage drum 312 to its effective position so that such a pin will be effective at a later time in the cycle of operation of the machine to render the insert 206 of the rotary printing unit effective to print additional or special text upon the bill S. The operation of the relay 426 also causes operation of the solenoid 325, there being a wire 443 extended from the other terminal of this solenoid and through a branch 444 to the contact 427A of the relay 426. The other contact of this relay is connected by wire 445 to the plug terminal 411 so that circuit may be completed to the solenoid 325 under certain circumstances as will hereinafter be described. A branch wire 446 from the wire 443 is connected to one terminal of the solenoid 320, and a wire 447 is extended from the other terminal end of the solenoid 320 to the plug terminal 413. The wire 443 has a branch 448 extended to the other terminal of the relay 429, and the wire 443 is connected to the plug terminal 412. The contacts 430 of the relay 429 are connected by wires 449 and 450 to the plug contacts 414 and 415 respectively so that opening of the relay contacts 430 may have a controlling action that in effect imparts to the relay 429 a control of the selecting or print-skip operation of the machine, as will hereinafter be described. The plug contact 417 is connected by a wire 451 to one of the contacts of the timing switch 435, while the plug terminal 416 is connected by a wire 452 to one contact of the timing switch 436, and the line wire L2 is connected to the other contacts of the timing switches 435 and 436 by branch leads 453 and 454 respectively, as shown in Fig. 26 of the drawings.

The energizing circuits for the various control solenoids are completed through the respective control switches in accordance with the setting of the storage pins of the various storage devices. Thus, with respect to the print-skip control solenoid 136, it will be recalled that the circuit is extended from the line wire L1 through the wire 421 to one terminal of the solenoid, and a wire 460 is extended from the other terminal of this solenoid to one of the contacts of switch 330. A wire 461 extends from the other contact of the switch 330 to the line wire L2 so that when the switch 330 is closed, the print-skip solenoid 136 is operated. Similarly with respect to the platen control solenoid 182, a wire 462 is extended from the other terminal to one contact of the switch 335, while a wire 463 extends from the other contact with the switch 335 to the line wire L2. The insert control solenoid 236 has circuit extended from the other terminal thereof by a wire 464 that extends to one contact of the switch 340, the other contact of the switch 340, being connected directly to the line wire L2. The solenoid 284 that controls the sorting platform 80 has a wire 365 extended to one terminal of the switch 336, a wire 366 being extended from the other terminal of the switch to the line wire 12 so that the solenoid 284 is energized when the switch 336 is closed.

The specific manner in which the operating units and control units are connected with the selector switches 370 is dependent upon the type of run that is being made with the printing machine, and is further dependent upon the system of identification or tabbing that is employed upon the printing devices D. Therefore, as a basis for a description of operation of the machine, one system of tabbing will be described in detail, and in this connection attention is directed to Figs. 23, 25, and Figs. 28 to 28E of the drawings. The system of tabbing for which the illustraed connections of the machine are particularly adapted is predicated not only on the arrangement or location of the tabs as 15 on the printing device, but also on the system or filling or arrangement of the printing devices in the filing system. Thus, the printing device D as herein shown are adapted for use in the preparation of insurance premium notices, and these printing devices are arranged in four different files, one file being arranged to contain all of the printing devices that pertain to policies upon which the premiums are to be paid monthly. The other three of the files are arranged to contain printing devices that relate to policies providing for annual premiums, semi-annual premiums, and quarterly premiums, such printing device in each file being arranged more or less indiscriminately, according to either the policy number or in an alphabetic arrangement. The three files that thus contain what may be termed the mixed printing devices, are arranged so that each of the three files contains only those printing devices that pertain to policies whose anniversary dates fall in selected months of the year. Thus, the first of these files, that may be called file 1, is arranged to contain printing devices pertaining to policies that have January, April, July, or October anniversaries. Similarly, the second file, which may be termed file 2, contains printing devices relating to policies having their anniversaries falling in February, May, August, or November. The third file, or file 3, is arranged to contain printing devices relating to policies that have their anniversaries falling in March, June, September, and December. This filing system thus segregates the printing devices according to anniversaries, but this segragation according to files is only partial in character, and the tabbing of the printing device is arranged to function in cooperation with the filing system to enable printing devices having any particular anniversary to be readily selected for printing or other purposes.

Thus each printing device has a tab 15 thereon that indicates the anniversary month of the policy to which such printing device pertains, it being kept in mind that such indication is attained through the cooperation of the tabbing system and the system of filing. Thus, tab positions 6A, 6B, 7A, and 7B have been allocated in the present instance for the mounting of tabs that constitute anniversary controls, and if the policy to which a particular printing device pertains has its anniversary falling in January, February, or March, a tab is mounted in position 7B as shown in Fig. 28B of the drawings. Similarly, the tab position 7A has been allocated to policies having their anniversaries falling in April, May, or June, this being clearly shown in

Fig. 28 which, in effect, constitutes a tabbing diagram to be used in determining where tabs are to be mounted for any particular printing device. Tab position 6B has been allocated to policies having their anniversaries in July, August, or September, while tab position 6A has been allocated to policies having their anniversaries in October, November, or December. Thus, when the printing devices of file 1 are run through the machine, a tab in position 7B will indicate a January anniversary, for it will be noted that while the tab position 7B pertains to policies having their anniversary in January, February or March, the filing of the printing devices in file 1 has been so arranged that file 1 includes only the January printing devices of the group of anniversary months to which the tab position 7B has been allocated. Thus printing devices having February or March anniversaries are not included in file 1, and the tab in position 7B in a run of the machine wherein file 1 is used will thus constitute a clear indication as to a printing device having a January anniversary and will enable selection of such a printing device by the selector mechanism of the printing machine. Similar anniversary selections may also be obtained in respect to the other months of the year through tabs in the anniversary group of controls when taken in connection with the system of filing the above described.

The printing devices are also arranged to bear index tabs 15 in positions that are indicative of the character of the premium payments that are to be made. Thus index tabs are provided to indicate that a particular printing device pertains to an annual policy or to indicate that the printing device pertains to a semi-annual policy. Thus, positions 9A and 9B have been allocated for purposes of semi-annual skip control of the machine, while positions 10A, 10B, 11A, and 11B have been allocated to what may be termed annual skip control of the machine. Position 9A has been allocated to policies wherein the premium is to be paid semi-annually in April, October, May, November, June, or December, while tab position 9B has been allocated to semi-annual policies wherein the premium is to be paid in January, July, February, August, March, or September.

Of the annual skip control positions, position 11B has been allocated to annual policies having their anniversary dates in January, February, or March; position 11A has been allocated to annual policies having anniversary dates in April, May, or June; position 10B has been allocated to annual policies having their anniversaries in July, August, or September; while the tab position 10A has been allocated to annual policies having their anniversaries falling in October, November, or December.

Positions 4B, 5A and 5B under the present system of tabbing are allocated to what may be termed the monthly cycle controls, and tabs in these positions are utilized only on what are termed monthly printing devices in that such printing devices pertain to policies that call for monthly payment of the premium. Tab position 5B has been allocated to what has been termed cycle 1 in Fig. 28 of the drawings, and a tab in this position indicates that the anniversary month of the policy to which the printing devices falls within January, April, July or October. Tab position 5A has been allocated to what has been termed cycle 2 in Fig. 28 of the drawings, and a tab 15 is located in this position on printing devices that pertain to policies having their anniversary dates in February, May, August or November. Tab position 4B under this system of tabbing has been allocated to what has been termed cycle 3 and a tab is located in this position when a printing device pertains to a policy having its anniversary date in March, June, September, or December.

As to printing devices that pertain to annual, semi-annual, quarterly or monthly policies, there may be instances where some special condition prevails with respect to any such policy, and this fact may be indicated by a tab located in some other selected position along the upper edge of the printing device. In the present instance the tab position 1A has been allocated for the indication of a premium or policy loan, and when there is such a policy loan in respect to any particular policy, a tab 15 is disposed in position 1A on the printing device that pertains to this particular policy. Similarly, there are many instances where the insurance contract calls for reduction of the premium by application of the dividend or other money amounts to the premium toward the payment of the premium, and when this provision is included in the insurance contract, a tab is located on the related printing device in position 3A.

Summarizing the foregoing system of tabbing of the printing devices, it should be observed that where a premium loan has been made, a tab is mounted in position 1A, and where a premium reduction is to be made on the anniversary date, a tab is mounted in position 3A. With respect to those printing devices that pertain to policies where the premium is to be paid monthly, a tab constituting a monthly cycle control will be located in one or the other of tab positions 4B, 5A or 5B. Similarly, in respect to semi-annual policies, a tab constituting a semi-annual skip-control means will be located in either position 9A or 9B, while in respect to annual policies a tab constituting an annual skip-control means will be located in one or the other of positions 10A, 10B, 11A or 11B. In the anniversary control portion of each printing device there will in every instance be a tab in one or the other of positions 6A, 6B, 7A or 7B so as to constitute an indication of the anniversary of the policy, and this will be evident in Figs. 28 and 28E of the drawings.

When the printing devices are stored in separate files in the manner hereinbefore described, and where the printing devices have been tabbed in accordance with the system hereinbefore set forth, the plugboard 400 is provided with a plurality of what may be termed permanent connections, and also has a plurality of what may be termed changeable connections that are changed each month, and that are changed to provide selectively for the running of the appropriate mixed file or the appropriate file of monthly printing devices through the machine. Thus, the relative permanent connections include a connector cord 470 that is plugged at its opposite ends into the plug terminal 410 and the output plug terminal 402 in position 1A. The plug terminal 410 is also connected to the plug terminal 411 by a connector cord 471, while the plug terminal 412 is connected by a connector cord 472 to the output terminal 402 in position 3A. The plug terminal 414 is connected by a connector cord 473 having branch leads 474 to the input plug terminals 401 in positions 6A, 6B, 7A and 7B as shown in Fig. 27 of the drawings.

The plug terminal 415 is connected to the terminal 417 by a connector cord 476, while the plug terminal 416 is conected by a cord 476 having branches 477 to the input terminals 401 in positions 9A, 9B, 10A, 10B, 11A and 11B. The input terminals in positions 1A, 3A, 4B, 5A and 5B are interconnected by a connector cord 478 having branches 479 at opposite ends thereof whereby such common interconnection is effected.

Where the plugboard 400 is thus interconnected, the further or changeable connections that are required to set the machine for operation upon printing devices in any particular month of the year are relatively simple, and in Fig. 27 of the drawings, the connections necessary for operation to print premium notices for the month of January have been illustrated. Thus, the plug terminal 413 has a connector cord 480 extended therefrom, and branch leads 481 on this connector cord are plugged into the output terminals 402 in positions 9A, 10A, 10B and 11A, and it is this connection that is effective in causing print-skip operation in the machine as will hereinafter be described in detail.

It will be recalled that when the file of mixed printing devices is being run through the machine, only that file of the files 1 to 3 is passed through the machine that includes the month for which the notices are being prepared. Thus, where the notices are being prepared for the month of January, the printing devices included in file 1 would be run through the machine, it being recalled that file 1 includes all of the annual, semi-annual and quarterly printing devices with respect to which the anniversary dates falling within the months of January, April, July or October. When such file of mixed printing devices is to be run through the machine, a further connection is afforded by a connector cord 482, which for a January run is extended from the output terminal in position 7B to the input terminal in position 1A. As will hereinafter be described in detail, the connector cord 482 is utilized only during the run of the file of mixed printing devices, and after such a run has been completed and it is desired to run the monthly printing devices through the machine, the connector cord 482 is disconnected from the input terminal 401 in position 1A and is connected to the output terminal 402 in position 5B, and the result of this shifting of the connections will be hereinafter described in detail.

When the machine is thus connected for a January run, and the printing devices of file 1 are passed through the machine, the print-skip operation of the machine is controlled by the tabs 15 that are located selectively in one or the other of the positions 9A to 11B, for the tabs that are located selectively in these positions indicate not only the anniversary but also the characteristics of the printing device as being either an annual printing device or a semi-annual printing device. In controlling such print-skip operation of the machine, it may be said that the selector mechanism functions in what may be termed skip-tab operation, for it will be clear that with the connections hereinbefore described on the plugboard 400, the machine will skip each printing device that bears a tab in position 9A, 10A, 10B or 11A. Thus, by reason of the system of filing that has been described hereinabove, the printing machine will make impressions only from the semi-annual printing devices having January or July anniversaries, it being noted that these are the only ones that do not bear a tab in position 9B and which are included in file 1 of the mixed printing devices. A similar situation prevails in respect to the annual skip-control in that of the printing devices included in file 1, the January printing devices are the only ones that do not have a tab in position 10A, 10B or 11A.

Thus when a printing device is sensed that has a tab in position 9A, 10A, 10B or 11A, a circuit will be established that will cause this printing device to be skipped when it reaches the printing position of the machine. As will be evident in Figs. 26 and 27 of the drawings, this circuit may be traced from the line wire L1 through the selector timing switch 436 which is closed after the sensing switches 470 have been closed, through the wire 452 to the terminal 416 and thence to the cord 476 and the branch leads 477 so that circuit is extended to all of the input terminals 401 in positions 9A to 11B inclusive. Since it is assumed that one of the switches 370 in positions 9A, 10A, 10B or 11A has been closed, circuit will be extended to one of the branch leads 481 and through the connector cord 480 to the plug terminal 413. The circuit is extended from this plug terminal through the wire 447 to one terminal of the solenoid 320, and from this terminal the circuit is extended through the solenoid 320 and wires 446, 443 and 448 in series to one terminal of the selector relay 429 and wires 448 and 424 extend in series from the other terminal of the selector relay 429 to the other line wire L1. Thus, the closure of a switch 370 in position 9A, 10A, 10B or 11A causes the selector relay 429 to be operated, and also causes the solenoid 320 to be operated. Such sensing operation takes place while the printing device is located in station II, and the arrangement of the cam 110 and the cam shaft 95 is such that such sensing operation takes place soon after a printing device D has been moved into sensing position II. In this connection, it may be observed that the printing device advancing means operates in timed relation to the operation of the platen P in certain cycles of operation of the platen operating shaft 56 so that during the last operation of the platen in respect to a particular printing device, the printing device feeding mechanism is operated through its conditioning movement during the time when the last operation of the platen P is taking place, and after such operation of the platen, the printing device in station II is advanced to station III. By reason of the location of the cam lobe 110' on the cam shaft 95, the sensing of the printing device D in station II takes place immediately after the printing device has reached sensing station, so that a storage plunger set up in response to such sensing will reach and close the switch 330 during the last of the next three cycles of rotation of the platen operating shaft 56. Hence, upon closure of the switch 330, the solenoid 136 will be energized so as to render the print-skip latch 131 effective. As a result, the stop lever 126 is latched in its effective position and serves to disengage the platen clutch pawl 120 at the end of the last of the three printing operations of the platen P. The period of energization of the solenoid 136 is only sufficient to enable the latch 130 to fully engage the tooth 128, and upon de-energization of the solenoid 136, the selector rocker 133 returns to its normal position of Fig. 4. The latch 130, however, remains effective during the next three cycles of the platen shaft 56, since it cannot disengage

until the next operation of the printing device advancing means.

More specifically, it will be clear that the operation of the solenoid 320 causes the storage plunger that is at this time substantially aligned with the armature of the solenoid to be moved longitudinally to its set or operative position, and as the rotative movement of the storage member 310 progresses, this plunger will move toward the switch 330 and will close this switch before the time when the printing operations have been completed from the printing device then at printing position. Hence, the switch 330 will be closed during but prior to completion of the last printing operation on the printing device then at printing position, and circuit will then be completed from the line wire L2 through the wire 461, the switch 330 and the wire 460 to one terminal of the skip solenoid 136, and circuit through this solenoid is completed by wire 421 extended to the line wire L1 from the other terminal of the solenoid. Thus the link 134 will be pulled downwardly so as to move the rocker 133 in a counter-clockwise direction. This puts the spring 137 under tension so as to cause the latch 130 to become effective to latch the stop lever 125 in its effective position. Thus at the end of the cycle in which the last impression is made from the printing device then at printing position, the clutch pawl 120 will be disengaged and the platen P will remain inactive until such time as the printing device advancing means are again operated. Thus the latch 130 will be disengaged after three revolutions of the platen operating shaft 56 unless, of course, the next printing device is to be skipped.

The selector relay 429 is also energized where a printing device is to be skipped, and the effect of this operation of the selector relay 429 is to open the relay contacts 430 and thereby prevent setting up of other sections of the storage apparatus, as will hereinafter be evident.

In the event that an impression is to be made from a particular printing device, the selector relay 429 is not energized, and it is necessary that other control circuits be completed in respect to those printing devices that bear a tab in position 1A or in position 3A. In respect to those printing devices that bear a tab in position 3A so as to indicate that a reduction in premium is to be made on the anniversary of the policy to which the printing device pertains, the control circuits are so operated in connection with the sensing of the printing device that the platen section P2 will be receded when an impression is made from the printing device at station III, and circuit will be so made that when the bill or premium notice printing from this printing device reaches the sorting platform 80, this sorting platform will be so operated to discharge the printing device into the special hopper 82 rather than into the regular hopper 81.

Furthermore, where a printing device bears a tab in the printing position 1A, the general operation of the machine will be substantially the same as where a premium reduction is to be made, but in addition, the storage mechanism will be so set up that when the bill or premium notice made from the particular printing device is passed through the rotary printing unit 40, the insert text carried on the member 208 will be printed, the section 208 being moved outwardly to its effective position in order to accomplish this result.

Where the print-skip controls of the machine have indicated that an impression is to be made from a particular printing device, the selector relay 429 is not operated, and where the printing device bears a tab in position 3A, the circuit may be traced as follows. Circuit extends from the line wire L2 through the timing switch 435 and through the wire 451 to the plug terminal 417. Circuit extends from this plug terminal through the connector cord 475 to the terminal 415 and thence through a wire 450 through the contacts 430 of the selector relay and through a wire 449 to the plug terminal 414. The connector cord 473 and its branch leads 474 extends circuit to the input terminals 401 in positions 6A, 6B, 7A and 7B and if the printing device has a tab in the position 7B, circuit will be extended through the related switch 370 to the output terminal 402 in position 7B. Hence, circuit in such an instance will be further extended through the connector cord 482 to the output terminal 401 in position 1A, and through the wires 479 to the input terminal 401 in position 3A. Since the printing device under discussion bears a tab in position 3A, circuit will be extended through the related switch 370 to the output terminal 402 in position 3A. Thus the connector cord 472 extends circuit to the terminal 412 and from this terminal the wire 443 extends the circuit to the solenoid 325. From the other terminal of the solenoid 325 the wires 432, 431 and 424 in series extend the circuit to the other line wire L1, and hence the solenoid 325 will be energized so as to properly set the storage pin that is then in substantial alignment with the armature of the solenoid. When a storage pin has thus been set, the advancing movement of the storage member 311 moves such pin into engagement with the switch 435 just prior to the time when the cycle of printing operations with respect to the printing device is to be started, and hence the solenoid 182 will be energized so as to render the stop 174 effective. This causes the platen section P2 to be receded during the next three operations of the platen P and hence the amount of the premium as indicated at M' on the printing device will not be printed upon the bill that is being produced from this particular printing device. When the special bill or notice that has thus been produced from this particular printing device reaches the sorting platform 80, the switch 336 will be closed by this same storage plunger, and hence the sorting platform 80 will operate to discharge the special bill into the hopper 82 that contains the special bills or notices. Such operation of the sorting platform 80 takes place when the setup storage plunger reaches the switch 336 and closes the same. Such switch closure extends circuit from the line wire L2 through the switch 336 then wire 365 to the solenoid 284 from which circuit is further extended to the other line wire L1. This causes the solenoid 284 to be operated to withdraw the stop lever 277 and when this is done the associated clutch is effective to operate the cam 275 through a cycle in which the lever 265 is moved to the left as viewed in Figs. 6 and 26 and this causes the bill or notice to be sorted into the special hopper.

In the event that an impression is to be made from a printing device that bears a tab in position 1A, a circuit is completed from the line wire L2 through the wire 453, the timing switch 435, the wire 451, the terminal 417, connector cord 475 and the terminal 415 to the wire 450 which extends to the selector switch 430. Circuit ex-

tends further from switch 430 through the wire 449 and to the plug terminal 414 from which circuit is further extended through the wire 473 and the branch leads 474 to the input terminals 401 in positions 6A, 6B, 7A, and 7B. The closure of the switch 370 in position 7B, because of the presence of a tab in position 7B, extends this circuit to the output terminal 402 in position 7B and the cord 482 extends circuit to the input terminal 401 in position 1A. Since the printing device under consideration bears a tab in position 1A the circuit is connected directly to the output terminal 402 in position 1A and thence through the cord 470 to the plug terminal 416. The wire 440 extends to the solenoid 328 and from the other terminal of this solenoid 325, the wires 431 and 424 in series extend to the other line wire L1. Thus under such circumstances the solenoid 328 is energized, thereby to render the aligned storage pin effective in the storage device 312. The circuit from the wire 440 also branches through the wire 441 and the relay 426 and thence through the wires 425, 428 and 424 to the other line wire L1, thereby to energize the relay 426 and close the contacts 427 thereof. When the relay 426 is thus energized, circuit is extended from the terminal 410 through the wire 471, the terminal 411, and the wire 445 to the contacts 427 and thence through a wire 442 and the wire 443 to the solenoid 325, this circuit being extended by wires 432, 431 and 424 in series to the line wire L1. Thus the solenoid 325 operates simultaneously with the solenoid 328 to render the aligned storage plunger of the storage device 311 effective. In attaining this result, the relay 426 acts to provide something in the nature of a shunt circuit about the input and output terminals 401 and 402 in position 3A. Hence, in respect to the printing device that has been sensed, the platen P2 will be receded in the manner hereinbefore explained, and the bill or notice produced will be sorted into the special hopper as hereinbefore described, and in addition to this, the insert 208 on the rotary printing mechanism 40 will be rendered effective to print additional text on the sheet S. Thus when the setup storage plunger on the storage means 312 reaches the switch 340, this switch will be closed to thereby extend circuit from the line wire L2 through the wire 464, the solenoid 236 and the wire 422 to the other line wire L1, and when this takes place, the solenoid 236 will be energized and will move the control lever 240 into its effective position, thereby to cause the insert section 208 to be shifted outwardly.

Hence, when the plugboard 400 has the connector cord 482 extended between the input terminal 401 in position 1A and the output terminal 402 in position 7B, the printing devices included in the file 1 may be run through the printing machine and regular and special bills will be prepared and sorted under control of the identifying means only from those printing devices in which a premium payment is to be due in January.

Upon completion of the run of the mixed printing devices of file 1, it is customary to make the corresponding run of all of the monthly printing devices, and when this is to be done, the connector cord 482 is disconnected at one of its ends and a connector cord 490 is extended between the input plug terminals 402 in positions 5B and 7B, the connector cord 490 being indicated in dotted outline in Fig. 27 of the drawings. Since the monthly printing devices do not include tabs 15 in any of the semi-annual or annual skip-control positions, the connection 480 to the annual and semi-annual input terminals 402 may be left in position, and this is done in most instances because the same connections of the cord 480 are utilized for three successive months as will hereinafter be explained in detail. When the monthly connector cord 490 has been put in position as aforesaid, the monthly file of printing devices may be run through the machine, and in such a run a premium notice S will be produced for each of the printing devices. Thus in a monthly run, the only controlling action that is attained by the sensing means is the production, where required, of special bills in respect to those printing devices having anniversaries falling in the month to which the run of the machine pertains. When a monthly printing device has a January anniversary, it will have an anniversary control tab in position 7B and will have a monthly cycle control tab in position 5B, as shown in Fig. 28E of the drawings. When the connector cord 490 is connected as aforesaid between the input terminals 402 in positions 5B and 7B, the sensing of the tabs in positions 5B and 7B on a January printing device will extend circuit from the input terminal in position 5B through the related switch 360 and the wires 479 to the input terminals 401 in positions 1A and 3A whenever such a January printing device is sensed. Hence, in the event that this printing device bears a tab in position 1A or 3A, circuit will be extended in the manner hereinbefore described to cause the machine to produce and properly sort a special bill in the manner hereinbefore described in respect to the run of mixed printing devices.

When a monthly run of bills is to be made for the month of February, the connection of the cord 480 and its branch leads 481 is the same as for a January run, but the mixed printing devices of file 2 are run through the machine in such an instance, and when this is done, regular and special notices S will be prepared only as to those printing devices with respect to which premiums are to be paid in the month of February. After completion of the run of mixed printing devices, the connector cord 482 is disconnected and the monthly connector cord 490 is extended between the output terminals 402 in positions 7B and 5A. Similarly, the connections of the cord 480 remain the same for a March run, but in such an instance the mixed printing devices of file 3 will run through the machine, and after completion of the run of mixed printing devices, the machine is conditioned for the run of the monthly devices by disconnecting the cord 482 and connecting the monthly connector cord 490 between the output terminals 402 in positions 7B and 4B.

For the run of mixed printing devices for the months of April, May and June, the connector cord 480 has its branch leads 481 connected to the output terminals 402 in positions 10A, 10B and 11B, and files 1, 2 and 3 are run through the machine successively for the months of April, May and June respectively. To set the machine for a monthly run for the month of April, the monthly connector cord 490 is connected at one end to the output terminal 402 in position 7A, and for the month of April, the other end of the cord is connected to the output terminal 402 in position 5B, for the month of May to such terminal in position 5A, and for the month of June in position 4B.

The connections employed in making the desired runs of the machine for the other months

of the year are generally similar to those hereinabove described in detail, it being noted that for the months of July, August and September the terminals in positions 10A, 11A and 11B are used for the branch leads 481, while for the months of October, November and December the terminals 10B, 11A and 11B are employed.

From the foregoing it will be evident that the present invention enables regular and special bills to be readily and easily prepared, since the special bills are automatically separated from the regular bills so as to render such special bills readily available for insertion of such additional text or numerical data as may be required. The present invention enables the character of the printed matter on the bills to be automatically controlled under the governing action of identifying means carried on the printing devices, and such identifying means are also effective under the present invention to cause the bills to be sorted in accordance with the characteristics that have been imparted thereto by the printing machine. It will also be evident that the arrangement of the present machine is such that the setup of the machine may be readily and easily accomplished and that such setup of the machine requires very little modification from month to month or in the course of the production of bills for any particular month.

Thus, while we have illustrated and described the preferred embodiment of our invention, it is to be understood that these are capable of variation and modification and we therefore do not wish to be limited to the precise details set forth, but desire to avail ourselves of such changes and alterations as fall within the purview of the following claims.

We claim:

1. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; impression means at said printing station including at least two impression portions adapted when operated to print impressions on to a sheet in said sheet guideway from a printing and control device disposed at printing position, control means for rendering one of said impression portions selectively active or inactive, rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged from said rotary printing mechanism, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, governing means controlled by said sensing means to govern the respective control means of said impression portion and said printing means to render said one impression portion and said one printing element of said rotary printing mechanism effective or ineffective in accordance with identifying means sensed by said sensing to thereby impart different characteristics to the respective instruments in accordance with the sensed identifying means, and said governing means also being operable under control of said sensing means to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

2. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged from said rotary printing mechanism, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, governing means controlled by said sensing means to govern the control means of said one printing element of said rotary printing mechanism to render said one printing element active or inactive in accordance with indentifying means sensed by said sensing to thereby impart different characteristics to the respective instruments in accordance with the sensed identifying means, and said governing means also being operable under control of said sensing means to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

3. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged from said rotary printing means, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, governing means including storage mechanism set up under control of said sensing means and operable to govern the control means of said one printing element of said printing means to render said one printing element active or inactive in accordance with identifying means sensed by said sensing to thereby impart different characteristics to successive instruments in accordance with the sensed

identifying means, and the storage mechanism of said governing means also being operable to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

4. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; impression means at said printing station including at least two impression portions adapted when operated to print impressions on to a sheet in said sheet guideway from a printing and control device disposed at printing position, control means for rendering one of said impression portions selectively active or inactive, rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, governing means controlled by said sensing means to govern the control means of said impression portion to render said one impression portion effective or ineffective in accordance with identifying means sensed by said sensing to thereby impart different characteristics to the respective instruments in accordance with the sensed identifying means, and said governing means also being operable under control of said sensing means to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

5. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; impression means at said printing station including at least two impression portions adapted when operated to print impressions on to a sheet in said sheet guideway from a printing and control device disposed at printing position, control means for rendering one of said impression portions selectively active or inactive, rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged, and having sorting means selectively operable to sort sheets into different groups, con-

trol means for said sorting means, sensing means at said sensing position, governing means including storage means set up under control of sensing means and operable to govern the control means of said impression portion to render said one impression portion effective or ineffective in accordance with identifying means sensed by said sensing to thereby impart different characteristics to successive instruments in accordance with the sensed identifying means, and said storage means of said governing means also being operable under control of said sensing means to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

6. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out of printing position; impression means at said printing station including at least two impression portions adapted when operated to print impressions on to a sheet in said sheet guideway from a printing and control device disposed at printing position, control means for rendering one of said impression portions selectively active or inactive, rotary printing mechanism to which sheets are fed one by one from said sheet guideway, said rotary printing mechanism having a plurality of printing elements one of which is adapted to be rendered selectively active or inactive, sheet sorting mechanism to which sheets are discharged from said rotary printing mechanism, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, governing means including a first storage device and a second storage device set up under control of said sensing means, said first storage device being operable to govern the the control means of said impression portion and said second storage device being operable to govern the control means of said printing means to render said one impression portion and said one printing element of said rotary printing mechansim effective or ineffective in accordance with identifying means sensed by said sensing to thereby impart different characteristics to successive instruments in accordance with the sensed identifying means, said first storage device being operable to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

7. In a printing machine for preparing business instruments having different characteristics from and under control of printing and control devices each embodying printing means and each adapted to bear identifying means at one or more identifying positions thereon, means affording a printing device guideway through which such printing and control devices are adapted to be passed one by one to sensing and printing positions disposed along said guideway, and sheet feeding means affording a sheet guideway along which sheets may be advanced into and then out

of printing position; impression means at said printing station to print impressions on to a sheet in said sheet guideway from a printing and control device disposed at printing position, rotary printing mechanism having impression means to which sheets are fed one by one from said sheet guideway, sheet sorting mechanism to which sheets are discharged from said rotary printing mechanism, and having sorting means selectively operable to sort sheets into different groups, control means for said sorting means, sensing means at said sensing position, means controlled by said sensing means and operable upon said impression means to vary the extent of the impressions made on the sheets in accordance with identifying means sensed by said sensing to thereby impart different characteristics to successive instruments in accordance with the sensed identifying means, and further governing means operable under control of said sensing means to govern said control means of said sorting mechanism to sort said instruments in accordance with the different characteristics thus imparted to said instruments.

8. In a printing machine of the character described, means for passing individual printing devices through said machine so as to bring such printing devices to rest successively at sensing and printing positions in the machine, means for feeding sheets one by one through said machine so as to bring said sheets to rest at said printing position, and sensing means at sensing position operable to sense identifying means carried by the printing devices; storage means operated in timed relation to said printing device advancing means and including storage elements adapted to be set up to represent identifying means carried on printing devices as they are sensed at sensing station, switch means arranged for operation by said storage means in accordance with the representations set up thereon, said switch means being disposed in different relationships to said storage means so as to be operated at succeeding intervals after the sensing of the related printing device at sensing position, impression means at said printing station controlled at least in part by one of said switches, sorting means to which said sheets are passed by said sheet feeding means, and control means for said sorting means governed by one of said switches in accordance with the setup condition of said storage means to thereby sort the completed business instruments in accordance with the identifying means carried on the printing devices from which said business instruments were respectively produced.

9. In a printing machine of the character described for producing business instruments, means for passing individual printing devices through said machine so as to bring such printing devices to rest successively at sensing and printing positions in the machine for the performance of sensing and printing operations at the respective positions, means for feeding sheets one by one through and to a discharge end in said machine so as to bring said sheets to rest at said printing position, and sensing means at sensing position operable to sense identifying means carried by the printing devices; storage means operated in timed relation to said printing device advancing means and including storage elements adapted to be set up to represent identifying means carried on printing devices as they are sensed at sensing station, switch means arranged for operation by said storage means in accordance with the representations set up thereon, said switch means being disposed in predetermined relationship to said storage means so as to be operated at a predetermined time interval after the sensing of the related printing device at sensing position, sorting means to which said sheets are passed by said sheet feeding means, and control means for said sorting means governed by said switch means in accordance with the setup condition of said storage means to thereby sort the business instruments in accordance with the identifying means carried on the printing devices from which said business instruments were respectively produced.

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