Nov. 13, 1956 J. T. EHRHARD 2,770,186

PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

Filed June 4, 1953 10 Sheets-Sheet 1

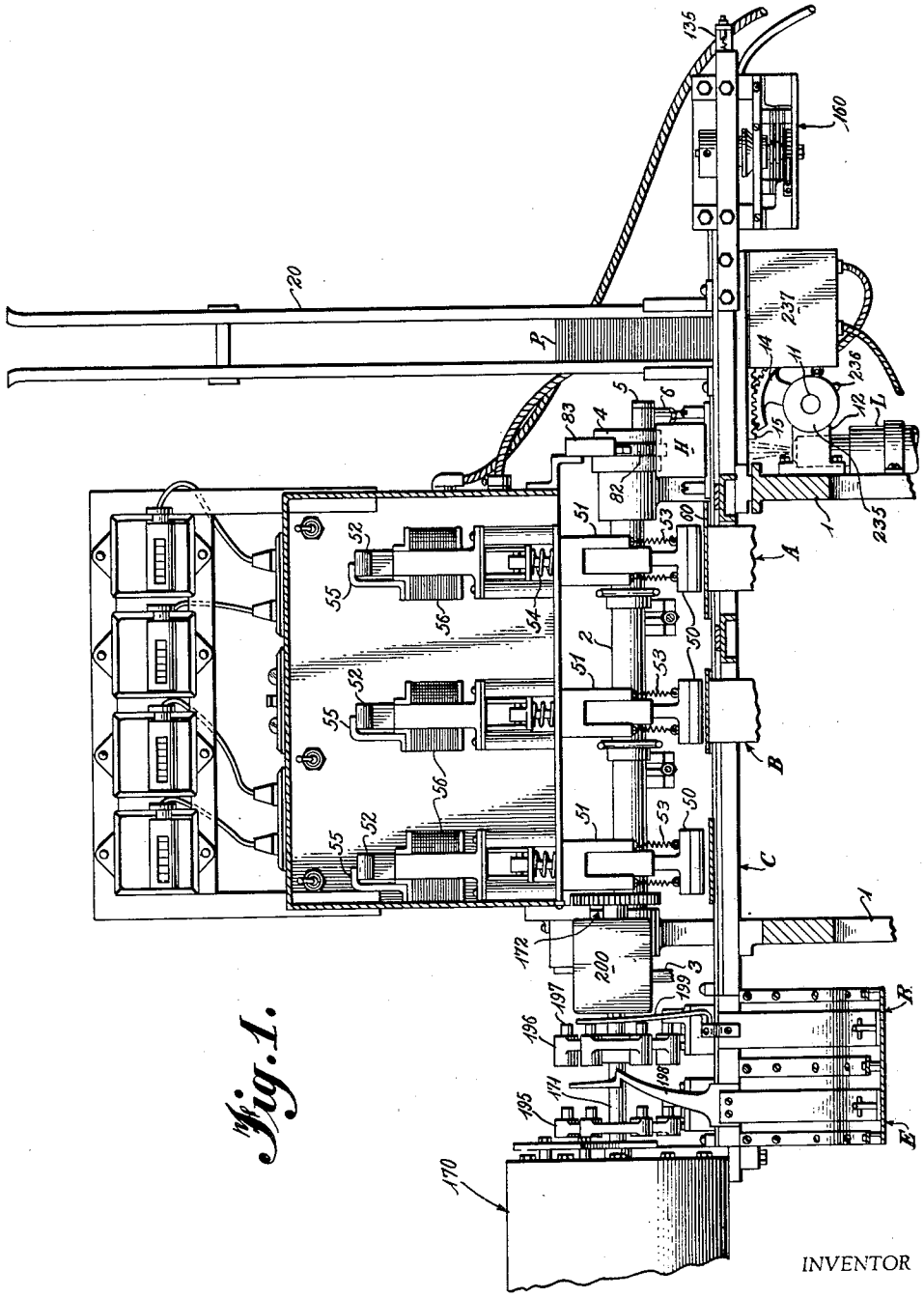

Fig. 1.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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Fig. 2.

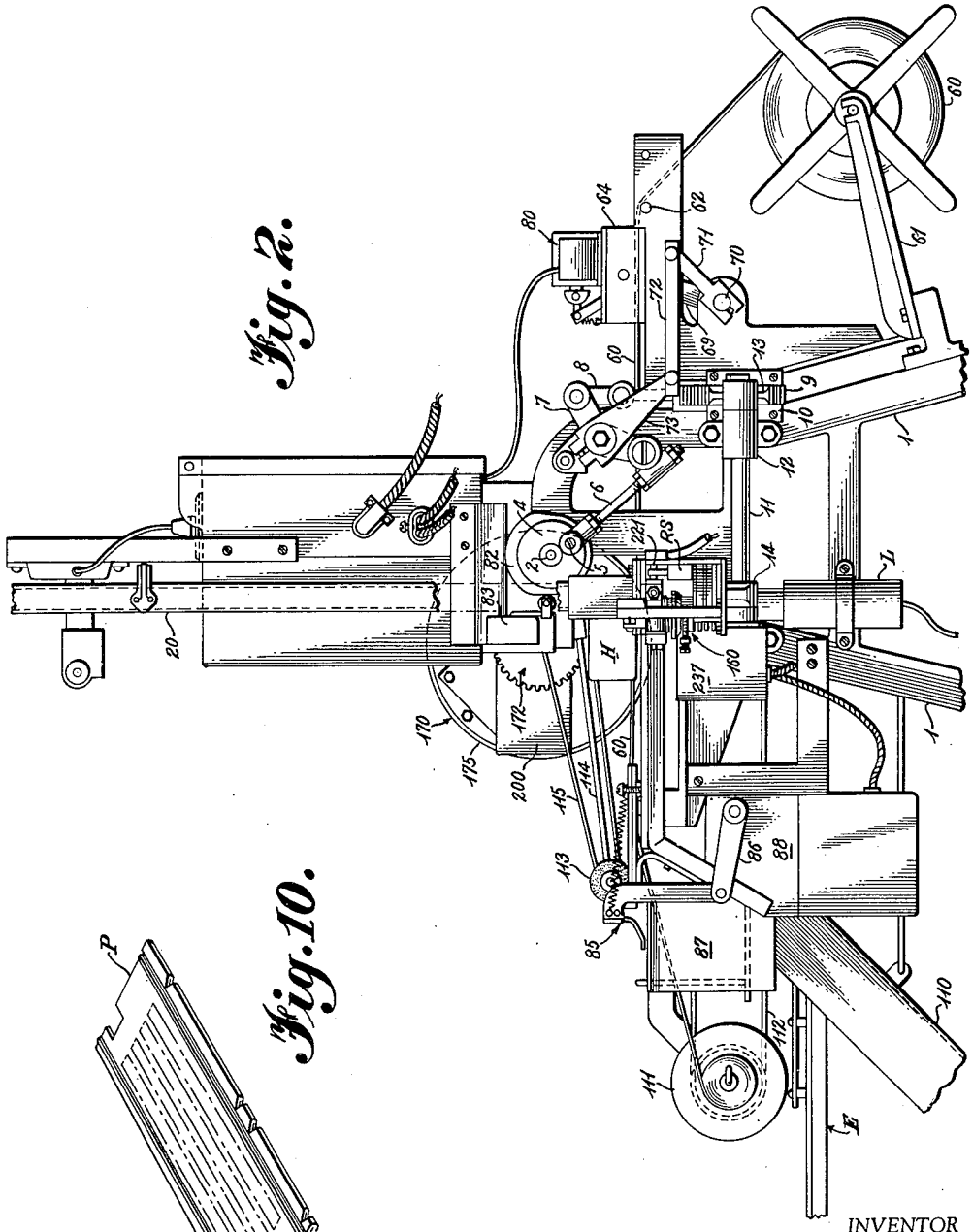

Fig. 10.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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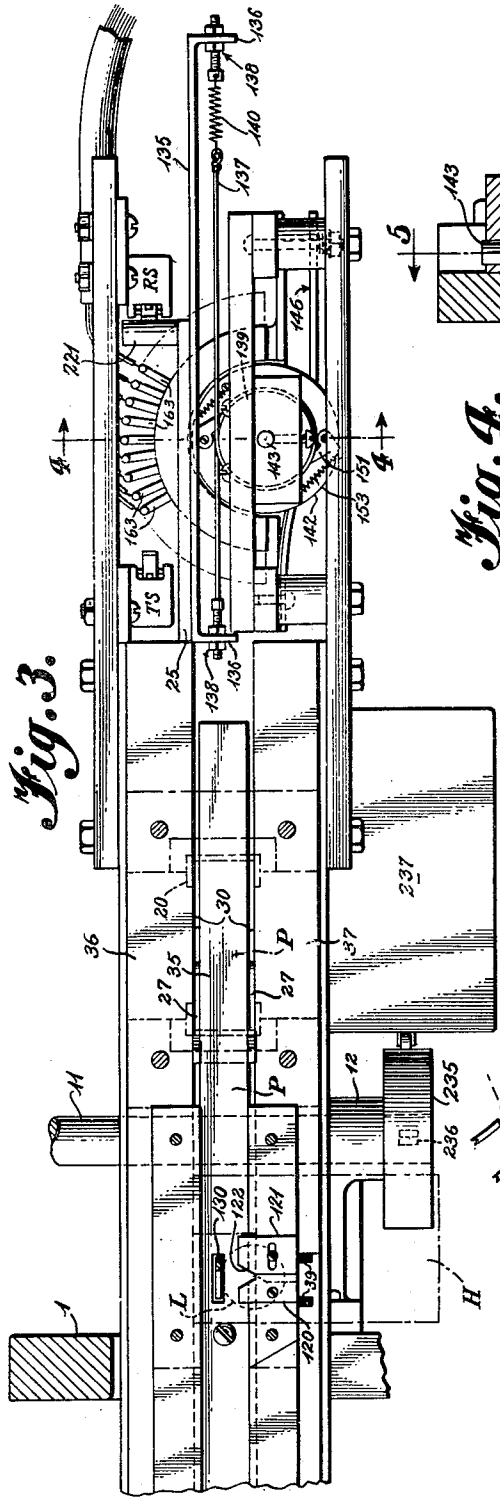

Fig. 3.

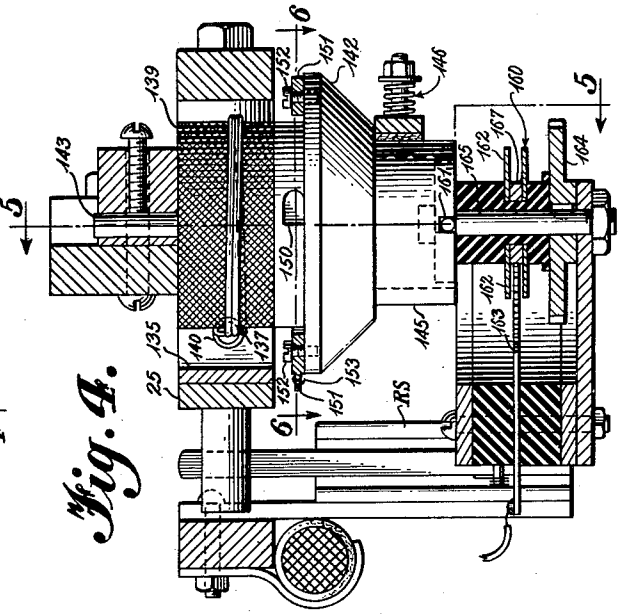

Fig. 4.

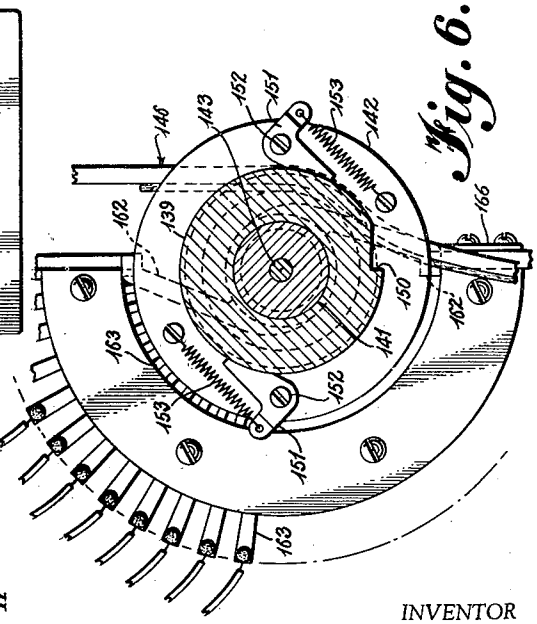

Fig. 6.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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Fig. 5.

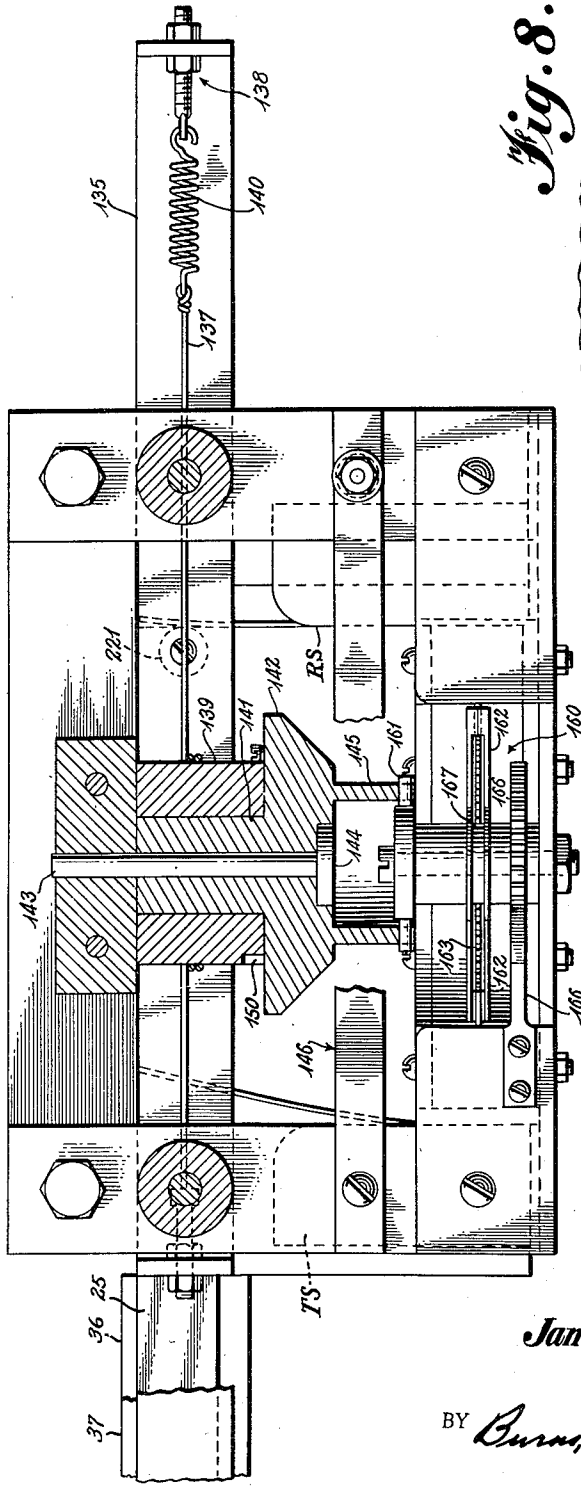

Fig. 8.

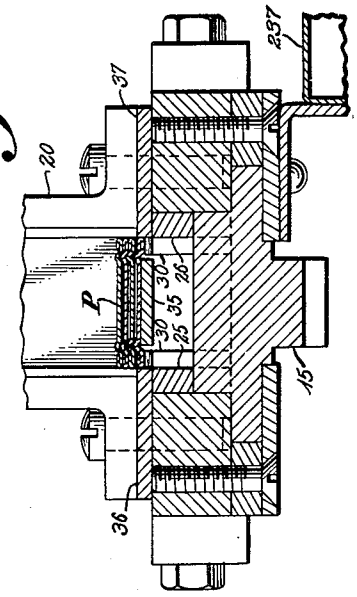

Fig. 9.

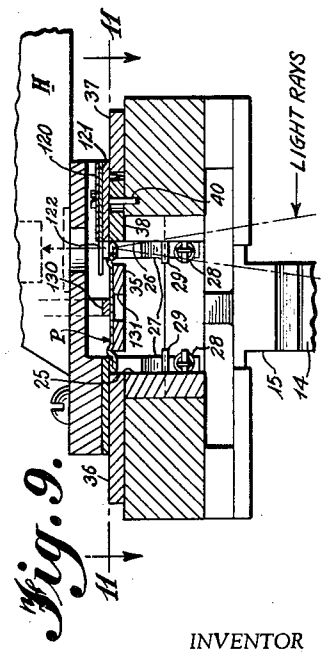

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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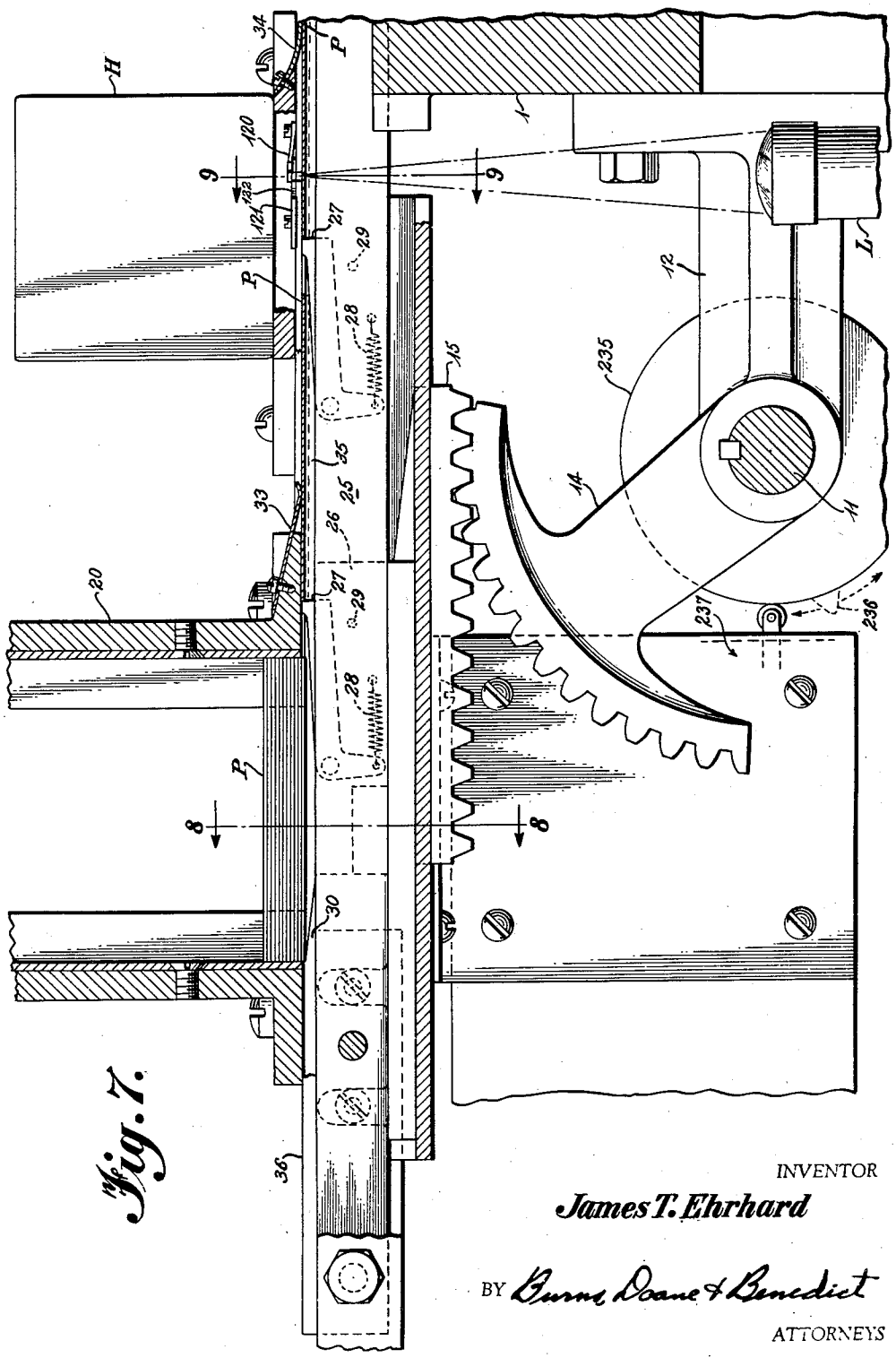

Fig. 7.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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Fig. 11.

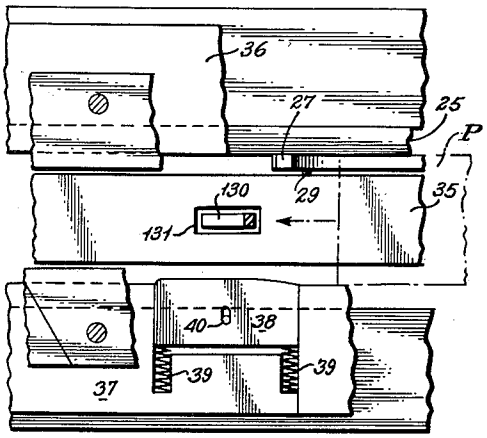
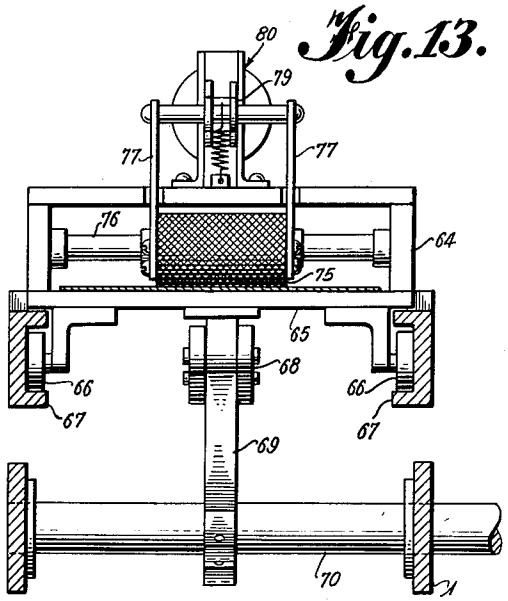


Fig. 13.



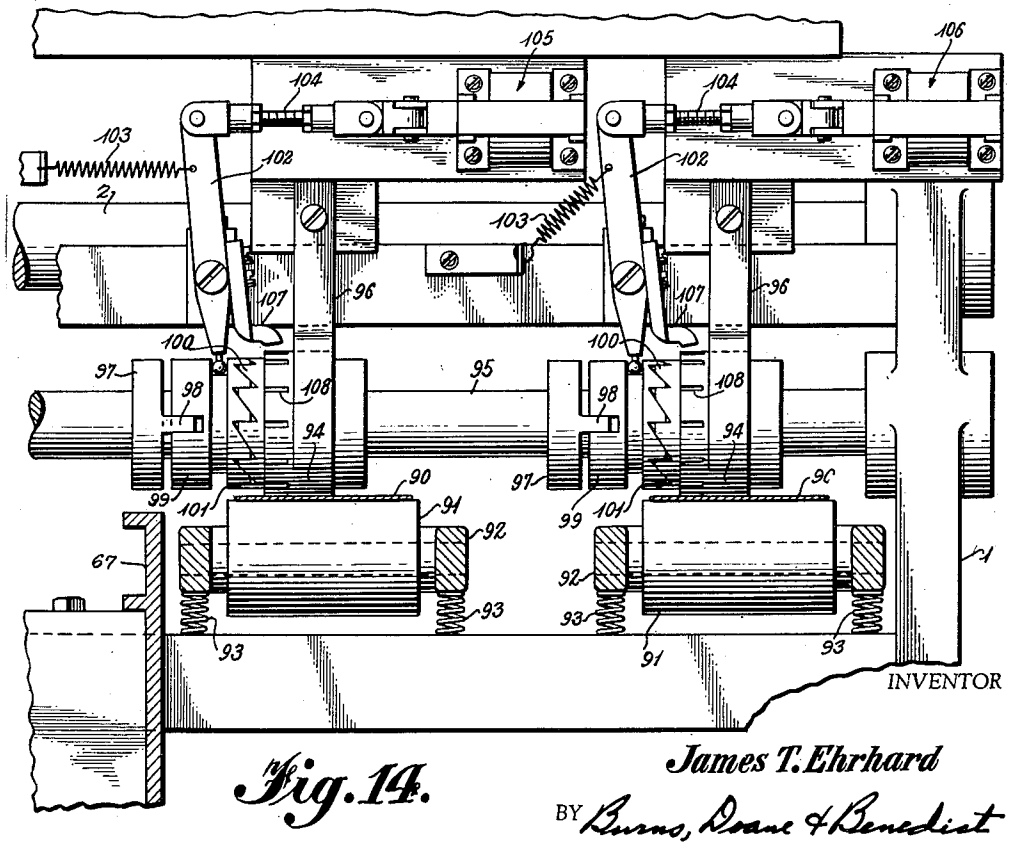


Fig. 14.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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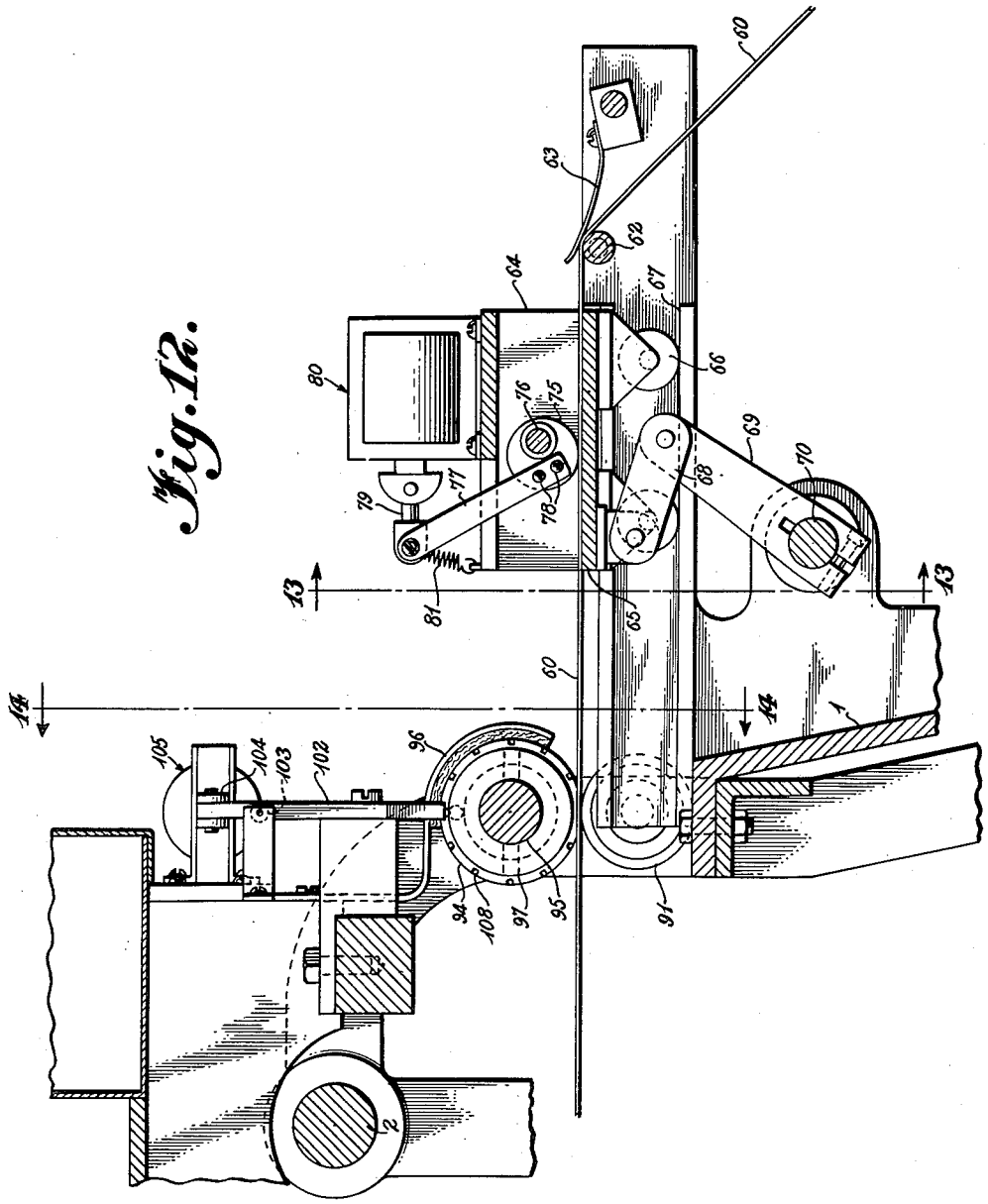
Fig. 12.



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Nov. 13, 1956 J. T. EHRHARD 2,770,186

PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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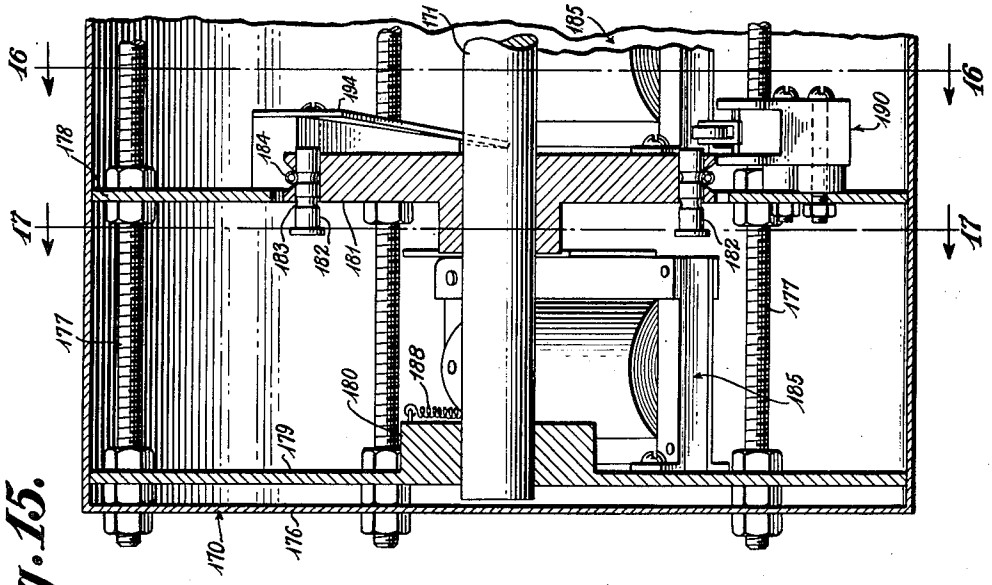

Fig. 15.

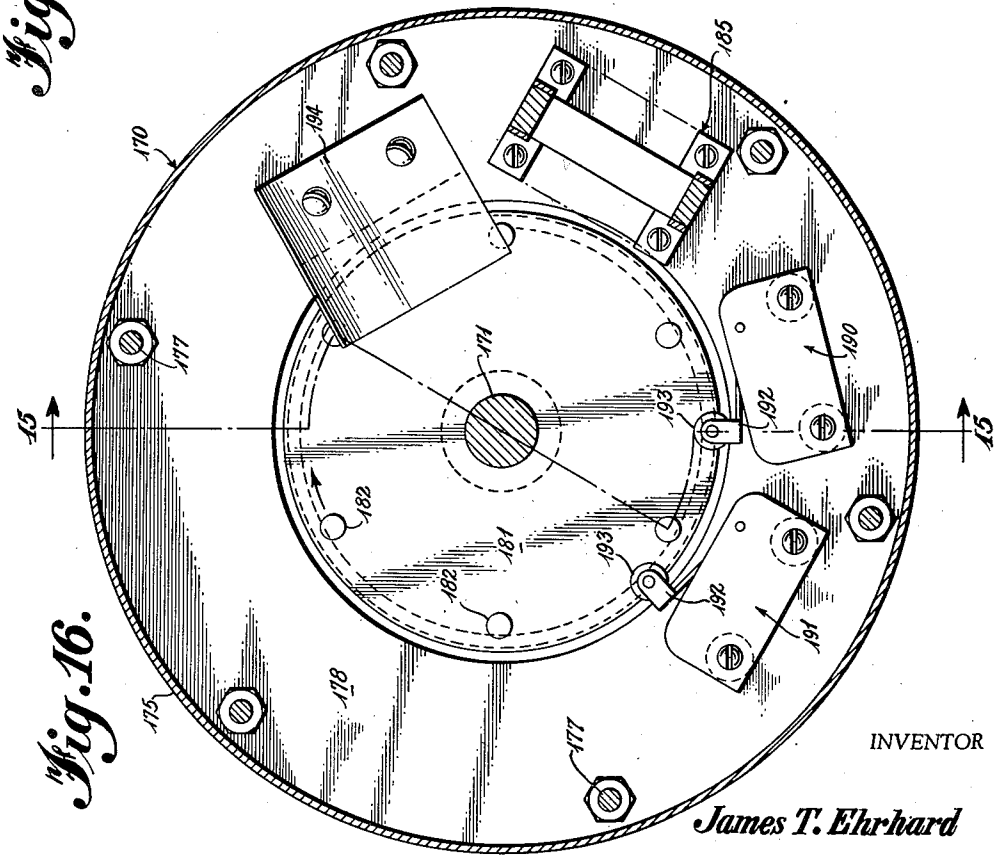

Fig. 16.

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Nov. 13, 1956 J. T. EHRHARD 2,770,186

PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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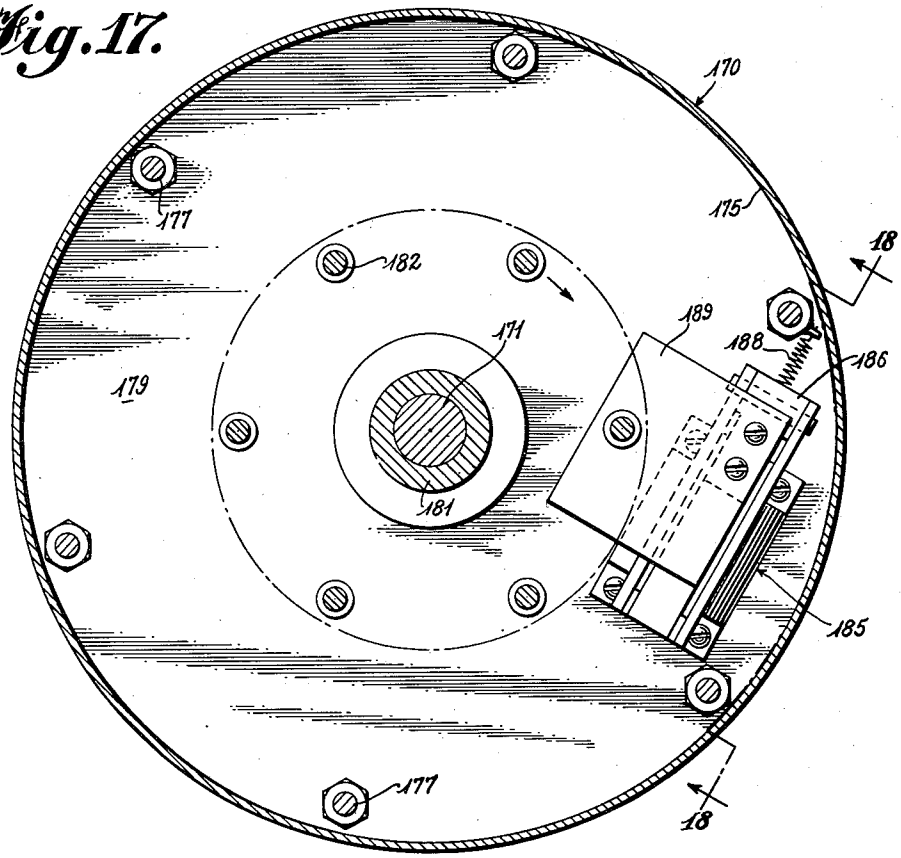
Fig. 17.



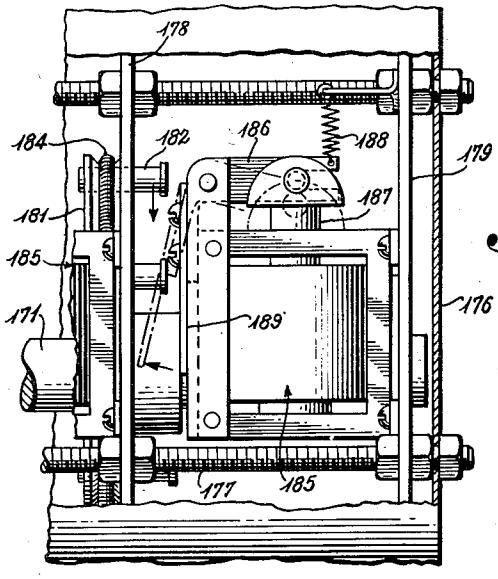


Fig. 18.

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PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

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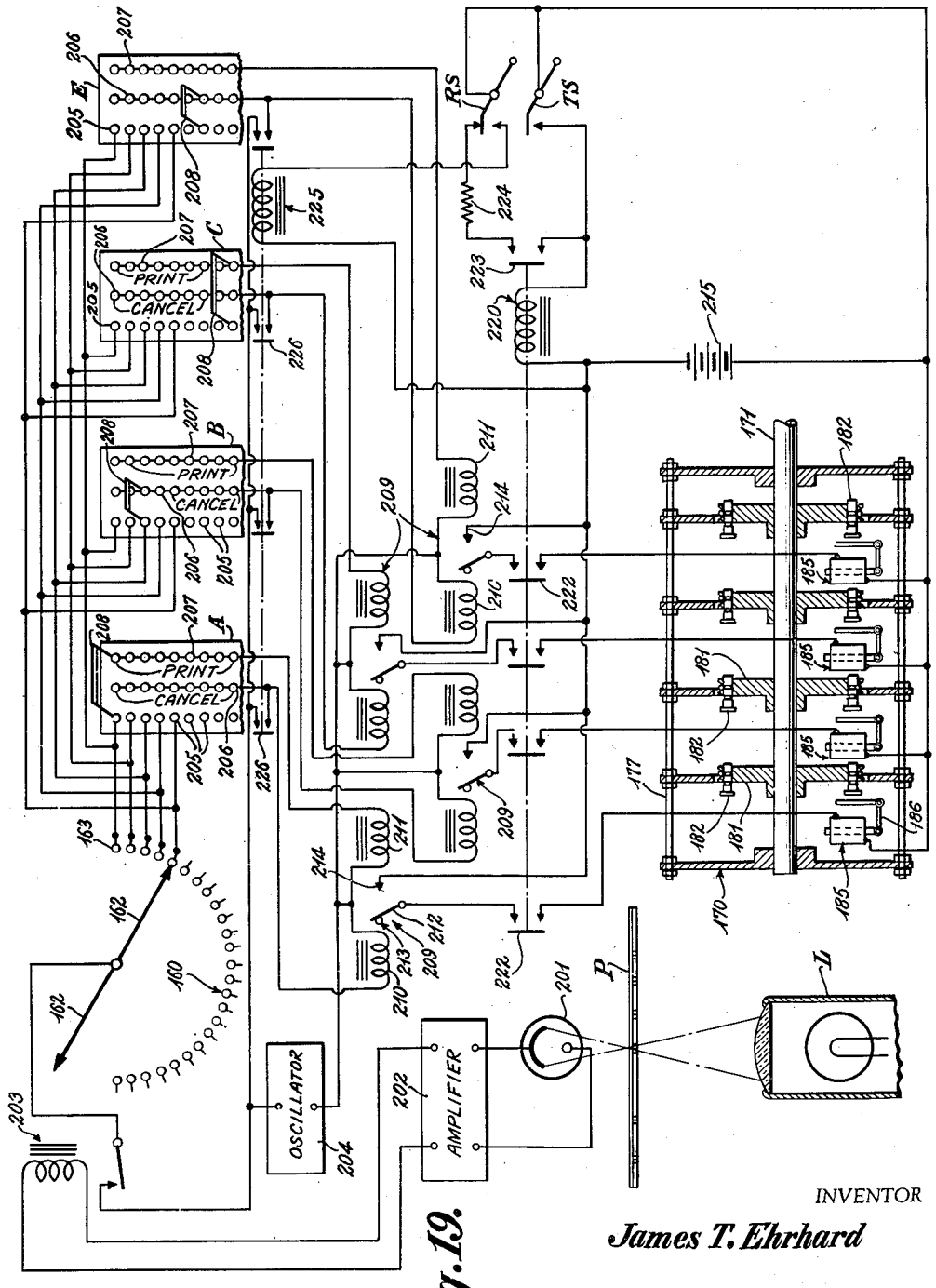

Fig. 19.

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United States Patent Office 2,770,186 Patented Nov. 13, 1956

2,770,186

PLATE SENSING MEANS IN ADDRESS PRINTING MACHINES

James T. Ehrhard, Arlington, Va.

Application June 4, 1953, Serial No. 359,519

20 Claims. (Cl. 101—57)

This invention relates generally to an address printing machine. More specifically the invention relates to an addressing machine having an improved address plate sensing device incorporated thereinto to effectively read the indicia of each plate as it passes through the machine and control the operation of the machine to perform the necessary function with each plate in accordance with the indicia of the plate.

Address printing machines presently available are extremely limited in their performance both as to speed of operation and as to flexibility in handling and utilizing the address plates. Thus the presently available machines are generally constructed for a specific operation to be performed with the plate and are not adaptable to enable the performance of a plurality of operations by the single machine.

Many of these addressing machines utilize address plates having notches, tabs or apertures spaced along the edge of each plate at particular locations to convey certain specified information regarding the plate. Such machines utilize mechanical sensing means which require that the plate be moved and halted momentarily to permit "reading" of the notches, tabs or apertures of the plate to determine the information set forth by the particular location of the indicating notches at cetera. Then in these presently available machines, in the case of subscription mailing operations, the plate is moved through the machine to either be printed at a printing station or sorted at the end of the machine into either the regular continuing addressee files or into files of address plates representing the addressees whose subscriptions have expired.

Accordingly it is a principal object of this invention to provide a printing machine which is capable of producing a multiplicity of seperate operations within the machine as dictated by the information carried by printing plates and which is capable of great flexibility in manipulating the machine to perform the desired operations with the various plates.

A further object of this invention is to provide an improved sensing means incorporated into an address printing machine which will enable the machine to be operated at high speeds while still obtaining accurate operation of printing and sorting with the address plates.

An additional object of this invention is to provide a printing machine which is capable of high-speed operation in sensing data carried by a printing plate while the plate is moving through the machine and utilizing such data in controlling the use made of such plate as it moves through the machine.

Another object of this invention is to provide a printing machine having an improved printing mechanism timed with the feed of material to be printed and movement of individual printing plates to the printing mechanism to effect superior printed results.

It is a further object of this invention to provide an address printing machine utilizing individual address printing plates having an improved material feeding device to effect an accurate feed of material timed to cooperate with the printing performed with said address printing plates.

A further object of this invention is to provide a printing machine utilizing separate printing plates movable successively to a printing station in said machine and having an improved feed for strip material to be printed and severing means to separate the material between the matter printed by successive plates.

It is also an object of this invention to provide a printing machine utilizing separate printing plates carrying distinguishing data thereon wherein photoelectric means are utilized in discerning said data from each plate successively as such plate moves through said machine, and electric circuits controlled by the photoelectric means to apply the data as the plate moves through the machine to mechanisms to effect printing or sorting of each plate.

A still further object of this invention is to provide an address printing machine having a photoelectric sensing means for determining the distinguishing indicia carried by each address plate as the plates move successively past the sensing station, and a multiposition switch timed to the movement of each plate past the sensing station to connect successive circuits to indicate the relative position of each indicia along the length of each plate.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of the appended claims without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a front view of the address printing machine of this invention with portions shown in section to more clearly illustrate various details of the machine.

Figure 2 is an end elevation of the address printing machine of this invention.

Figure 3 is a plan view with the address plate magazine and photocell having been removed, illustrating the sensing station and rotary multiposition switch at the right end of the machine shown in Figure 1.

Figure 4 is a sectional view of the rotary multiposition switch taken on line 4—4 of Figure 3.

Figure 5 is a sectional view taken on line 5—5 of Figure 4.

Figure 6 is a sectional view taken on line 6—6 of Figure 4.

Figure 7 is a vertical sectional view of the sensing station and showing the mechanism for moving the address plate from the address plate magazine.

Figure 8 is a sectional view taken on line 8—8 of Figure 7.

Figure 9 is a sectional view taken on line 9—9 of Figure 7.

Figure 10 is a perspective view of a typical address printing plate of the type utilized in the printing machine of this invention.

Figure 11 is a sectional view taken on line 11—11 of Figure 9.

Figure 12 is a vertical sectional view illustrating the material feeding mechanism used with one of the printing heads of the printing machine of this invention.

Figure 13 is a sectional view taken on line 13—13 of Figure 12.

Figure 14 is a view taken on line 14—14 of Figure 12, illustrating the clutch mechanism utilized in the paper feed to two of the printing heads of this printing machine.

Figure 15 is a vertical sectional view taken on line

15—15 of Figure 16, showing one section of the delay mechanism utilized in retaining data obtained at the sensing station while the printing plate moves to the proper point for use.

Figure 16 is a vertical sectional view taken on line 16—16 of Figure 15.

Figure 17 is a vertical sectional view taken on line 17—17 of Figure 15.

Figure 18 is a detailed view taken on line 18—18 of Figure 17.

Figure 19 is a schematic wiring diagram generally illustrating the operation of the sensing means and the control circuits for conveying the data received from the address plate to the delay mechanism of Figures 15 through 18.

In the specific embodiment illustrated on the accompanying drawings, a metallic address plate P of the form illustrated in Figure 10 is used. This plate is rectangular in shape and carries on one face thereof in the form of raised or embossed letters, the name, address and other identifying letters and/or numerals to be printed by use of the plate while running it through the addressing machine.

For many years metallic address plates have been used in expediting the mailing and circularizing of a wide variety of literature and advertising to a specified list of addresses. For example, in mailing a single issue of some of the more widely known monthly magazines, over a million separate address plates will be run through the addressing machine to transfer the name, address and other information on each of the plates to the tab which is secured to the magazine or its wrapper. At the same time, a continuous printed list is made with the plates by the mailing facility to serve as a record of the addressees who have been mailed particular issues of the magazine.

Since the number of address plates will vary from month to month in sending out a monthly magazine, and likewise since the same addressees will not receive the magazine each month, it is extremely important in the operation of an addressing machine that means be provided to effectively sort the large number of individual address plates, and control the operation of the printing to insure that the proper plates will be printed. Thus those plates for addressees whose subscriptions expire must be separated. Also many special situations arise where it becomes desirable to print a selected group of addressees from the regular subscription lists, as when those addressees whose subscription will expire in several months are to be notified in advance of such expiration.

In order that each address plate shall carry its own information regarding the characteristics of each individual's subscription or characteristics for distinguishing different mailing lists, the metal plates P as shown in Figure 10 are provided with V-shaped notches at specified spaced positions along one longitudinal edge of the plate. On any one address plate there may be, for example, space for approximately twenty-four notches along the edge of such plate. Each notch location on the edge of a plate may be adopted to indicate a certain specified piece of information regarding the addressee whose name, et cetera, appears on the surface of the plate. Thus as an example, the first twelve notch positions may be adopted to indicate the twelve months of the year. The appropriate one of these twelve locations will be notched on an addressee's plate to indicate the month in which the addressee's subscription expires. The next five notch positions along the edge of the plate may be adopted to designate five separate years, and there again the appropriate position will be notched to indicate the year in which the addressee's subscription expires. It will readily be appreciated that the remaining notches may be adopted to designate certain special information regarding the addressee whose name and address is embossed on the surface of the particular plate. Likewise, if desired, combinations of the twenty-four notches may be adopted to

indicate desired information regarding the addressee of the plate. It will be readily appreciated that the number of notches, i. e., twenty-four, described above, is merely exemplary and in no way limiting as to the scope of the invention, since any reasonable number which can be accommodated on the printing devices may be adopted.

In utilizing such address plates in an address printing machine, stacks of such plates are fed to the machine and moved successively through the machine to print the required address tabs and addressee record and be sorted at the end of the machine into groups of addressees whose subscriptions are to continue and addressees whose subscriptions expire.

It will be clear from the explanation above that the use made of each plate P in running through the printing machine can be controlled by the location of the notches along the edge of the particular plate. Thus when a stack of address plates are supplied to an addressing machine, the plate is initially moved to a sensing station wherein means are provided for determining the relative location of the notches along the edge of the plate and this information or data is transmitted through appropriate mechanisms of the machine so that the particular plate will be utilized within the machine according to the information conveyed by the relative location of the notches between the ends of the plate.

Following the sensing of the notch location on each plate, the plate is moved through the machine past the various printing stations and to the collecting rack at the end of the machine where the plates are sorted into those whose subscriptions are to continue and those whose subscriptions are to be terminated for some reason or another.

With the above description set forth as background, a specific disclosure of the apparatus of this invention will be given hereinafter. It will be readily appreciated that the specific address plate illustrated on the drawings is merely exemplary. Accordingly, any suitable printing plate having notches, tabs, apertures or other identifying media wherein the relative locations of the media is adopted to convey specified information distinguishing the plate, may be used within the contemplation of this invention. Likewise any number of such media or combinations thereof may be adopted to convey the desired information.

Figures 1 and 2 illustrate, respectively, front and end views of the overall printing machine. A main frame 1 serves as a means for supporting the various assemblies and mechanisms of the complete machine which cooperate in performing the addressing operations.

A main drive shaft 2 is journaled in the opposite sides of the frame 1 and is provided with suitable means for applying power thereto, such as pulley 3. Any suitable motor such as an electric motor (not shown) may be mounted at the base of the frame 1 and coupled to the pulley 3 so as to rotate the drive shaft 2 at the proper desired speed.

The outer end of drive shaft 2 has mounted thereon a disc 4 carrying eccentrically thereon a pin 5. An adjustable connecting rod 6 connects the pin 5 with a bell crank 7 journaled on a shaft extending horizontally from the outer side of the frame 1. The opposite end of the bell crank 7 is pivotally connected by a link 8 to a rack 9 slidably mounted in guides 10 secured to the side of the frame 1. It will thus be seen that rotation of the main drive shaft 2 by the motor means (not shown) will effect reciprocation of the rack 9 in the guides 10.

A shaft 11 mounted in bearings 12 secured to the side of the frame 1 has secured thereto at one end a gear section 13 engaged with the teeth of the rack 9. The opposite end of shaft 11 has a similar gear section 14 keyed thereto so that reciprocation of the rack 9 will effect back and forth movement of the gear sections 13 and 14 through the arc of their gear teeth. The gear

section 14 engages a rack 15 to which is secured the push rails which, as will be explained hereinafter, effect stepped movement of the individual address printing plates P through the addressing machine.

An address plate magazine 20 is mounted above the bed or plane of travel of the printing plates through the machine. A pair of channels form this magazine and engage the ends of a stack of printing plates P to retain the stack in position above the bed of the machine. The pusher mechanism for removing the plates P successively from the bottom of the stack is located immediately beneath the lower end of the magazine 20. This mechanism comprises a pair of push rails 25 and 26 which are keyed to and thereby moved by the rack 15. These rails carry the individual push pawls 27 which are appropriately pivoted to the opposite sides of the rails 25 and 26 at properly spaced points, so that reciprocation of the rails 25 and 26 by the rack 15 will insure stepped movement of the address plates P through the machine in properly spaced relation. The pawls 27 are biased by springs 28 to retain the pawls in their upper position for engagement with the rear end corners of the printing plates in pushing such plates through the machine. Pins 29 are provided to extend horizontally from the inner faces of the rails 25 and 26 positioned to limit the possible downward movement of the outer ends of the pawls 27.

In operation of the machine with the rails 25 and 26 reciprocated in timed relation to the speed of the machine, the push pawls 27 in moving forward or to the right as viewed in Figure 7, engage the end corners of a plate and move such plate forward through the machine. On the return stroke of the pawls 27 carried by the rails 25 and 26, the pawls will ride beneath the surface of the following printing plate and be urged upwardly by springs 28 after passing under such plate in readiness to engage the rear end corners of the following plate.

The push pawls 27, however, do not effect removal of the printing plates from the magazine 20. For this purpose separate push sections 30 are secured to the inner opposed faces of the rails 25 and 26. These sections 30 are provided with notched leading edges to engage the rear corners of a plate in the magazine 20 on forward movement of the rails 25 and 26. Further, these sections have a horizontal edge portion following the notched leading edge, such portion serving to support the remaining plates in the stack in magazine 20 during the period that a plate is being removed from the stack by forward movement of the rails 25 and 26 carrying the sections 30. It will be apparent that once the sections 30 have moved a plate from the bottom of the stack in magazine 20 on return movement of the rails 25 and 26, the spring biased pawls 27 will move to engage the end of the plate which has just been removed from the magazine.

In the specific embodiment of this invention, a pair of push rails 25 and 26 are provided to carry push pawls 27 to engage the rear end corners of the printing plate. It is not absolutely necessary, however, to provide a pair of rails 25 to move the plates through the machine. In the embodiment shown, the rail 26 extends only for a sufficient length of the machine to assist in pushing the plate past the sensing station where the location of the edge notches on the plate will be read. It has been found that in high-speed operation of the machine, the provision of a pair of push rails at this particular location insures more accurate movement of the plate past the sensing station and thereby insures more accurate reading of the notch locations. The push rail 25 extends throughout the full length of the machine and has spring biased push pawls 27 pivotally mounted at appropriately spaced positions along a substantial portion of the length of the push rail to move the plates successively from the magazine to the appropriate collecting rack.

As the individual address printing plates P are moved through the machine by reciprocation of the pushing rails 25 and 26, such plates are urged by spring members 33 and 34 against horizontal support strip 35 which engages the central underside of the plates. Likewise the longitudinal edges of the plates are guided by suitable guiding strips 36 and 37 mounted in spaced parallel relation so as to receive the width of the plate therebetween.

To insure accurate positioning of the individual printing plates at the sensing station, the guiding strip 37 has a section 38 movable inwardly toward the path of the plates at the general location of the sensing station. Section 38 is urged inwardly by springs 39 and limited in its inward movement by a pin 40 extending through an elongated slot within the section 38. Thus at the sensing station the section 38 will urge each plate P against the side of the opposite guide strip 36 and insure very smooth and accurate movement of the plate through this portion of the machine. Repeated reciprocations of the rack 15 and the push rails 25 and 26 carried thereby effects movement of each plate P from the stack in magazine 20 past the sensing station of the machine beneath, successively, the three printing stations A, B and C and thence to the sorting stations for collecting the plates.

At the collecting point the plates are alternatively sorted into two groups, one containing those prints which are to be retained in the active files of the mailing list and the other containing those plates of addressees whose subscriptions expire and thus are to be placed in an inactive collection of address plates. It will be recognized that the information indicated by the relative notch locations on the edge of a plate will be used in determining the disposition to be made of that particular plate. Thus the mechanism at the sensing station will determine from the notch locations whether the plate is to be kept in the active files or collected with those plates of inactive addressees, and when the plate reaches the sorting stations it will be disposed of in accordance with the information gleaned from the plate at the sensing station.

The address printing machine of the embodiment shown is provided with two collecting racks, one identified as R for the regular or active address printing plates, and the other parallel thereto identified as E, for the expired plates or plates of addressees whose subscriptions are to expire. The operation of the mechanism which effects sorting of the successive plates into the two collecting racks R and E will be described in detail in the description of the overall operation of the machine as hereinafter set forth.

In the printing machine of this invention three individual printing stations, A, B and C, are mounted above the bed of the machine. Each of these printing stations has a printing platen 50 with an integral rod slidably mounted in a guide 51 and driven by actuating rod 52. Springs 53 are provided between the platen 50 and guide 51 to normally retain the platen in its raised position above the material to be printed. A spring 54 is coupled with the actuating rod 52 to retain it raised above the rod integral with platen 50. A stop 55 is secured to engage the upper end of the actuating rod 52 and limit the uppermost position of the actuating rod. A solenoid coil 56 is operatively associated with the actuating rod 52 to effect on energization the downward movement of the actuating rod and thereby cause printing by driving the platen 50 into cooperation with the address plate positioned beneath the platen. The timing for energization of the respective solenoid coils 56 for the three printing stations A, B and C will be described with the description of the overall operation set forth hereinafter.

As shown in Figure 1, the printing stations A and B are provided with suitable inking ribbons which pass between the plates moved along the bed of the machine and the strip material which is to be printed. On energization of the solenoid coil 56 for stations A and/or B, the respective platen 50, on downward movement, will drive the strip material to be printed into contact with the re-

spective ribbon supported on the raised lettering of the printing plate centered below the platen to effect printing of such plate lettering on the strip material.

In the specific embodiment illustrated as shown in Figure 1, an offset printing technique is adopted in performing the printing of the material passing beneath the platen **50** of this printing station C. Thus at this printing station the material to be printed is driven into engagement with the printing plate by the platen **50**, which address plate has previously been inked by one or both of the inking ribbons used with the printing stations A and/or B. With this particular set up it is contemplated that each plate will be printed at one or both of the preceding printing stations A and B, so that the plate will have enough residual ink on its lettering to enable printing at station C without an inking ribbon. It will be readily appreciated, however, that station C may also be provided with an inking ribbon if desired.

In the address printing machine embodiment shown, the three printing stations A, B and C are adapted to perform the printing operation on two different types of material for three different distinct proposed uses. Thus at station A, 3x5 cards are printed on stiff strip material with the various printing plates under control of the data indicated by the relative positioning of notches along the edges of the plates. At Station B a strip of paper material is printed with the designated printing plates with every space on the strip being utilized for an address label and the continuous strip being cut after every twenty addresses. The station C utilizes a strip of paper material similar to that used at station B printed with the designated printing plates and rerolled onto a spindle after printing for use by appropriate label applying machines in cutting the rolled strip material into labels having a single address thereon and applying the labels to the article to be mailed.

Referring specifically to the printing of the 3x5 cards at printing station A, it will be seen that a roll of material **60** is mounted on a roll holder **61** secured to the rear of frame **1**. This material, having a width of five inches, is aligned with the printing position of station A and is fed up to the material feeding mechanism and thence to the printing station. The material **60** is unwound from the roll to run up and over a guiding pin **62** rearwardly of the printing station A. A retarding spring **63** presses the material **60** against the guiding pin **62** to restrict forward feed of the material **60**.

As shown in Figures **12** and **13**, the material feeding mechanism for station A consists of a reciprocating carriage **64** having a platform **65** on which the material **60** is supported. The carriage **64** is provided with wheels **66** which are guided in tracks **67** mounted on the rear of the main frame **1** of the machine in spaced parallel relation. The carriage **64** is caused to reciprocate in the tracks **67** by a link **68** pivotally connected between the underside of platform **65** and a crank **69** which is secured to a shaft **70** appropriately journaled in bearings mounted in the main frame **1**.

Referring specifically to Figure 2, a crank **71** is mounted on the outer end of the shaft **70** and a link **72** is pivotally conected between the outer end of the crank **71** and a crank **73** connected so as to move with the bell crank **7**. Thus the oscillating movement of the bell crank **7** upon rotation of main shaft **2** will transmit through the linkage above described a reciprocating motion to the carriage **64** guided in the tracks **67**.

A knurled roller **75** is eccentrically mounted on a shaft **76** journaled in the carriage **64** to engage the upper surface of the material **60**, pressing such material against the platform **65** and thus clamping the material to move with the carriage **64** upon the forward movement of such carriage. It will be clear that by clamping the material to move with the carriage **64**, the material **60** will be carried on forward carriage movement to successively feed fresh material to be printed beneath the platen **50** for each actuation of the printing station A.

To operate the knurled roller **75** to engage or disengage the material **60**, a pair of arms **77** are secured to the outer ends of the roller **75** as by screws **78**. A link **79** pivotally interconnects the outer ends of the arms **77** with the core of a solenoid **80**. A spring **81** urges the arms **77** and the knurled roller **75** to clamp the material **60** for feed of such material. However, upon energization of the solenoid **80**, the arms **77** will cause the roller **75** to be partially rotated, thereby disengaging the roller from the material and allowing the carriage to reciprocate in the tracks **67** without feed of the material.

It will be apparent that each oscillation of bell crank **7** will effect through the elements described, reciprocation of the push rail **25** to move a printing plate to the printing station A and reciprocation of carriage **64** to feed fresh material to the printing station A to be printed by the plate. To feed each three-inch fresh section of material **60** to the printing station A, the solenoid **80** is deenergized on forward movement of carriage **64** to clamp material **60** and feed such material to the station. On the return movement of carriage **64**, the solenoid **80** is energized to disengage roller **75** and prevent the material which has just been fed from being retracted from beneath the platen **50** of printing station A. To effect this alternate energization of solenoid **80**, a cam wheel **82** mounted to rotate with disc **4** and shaft **2** engages the actuating lever of a switch **83**. The cam wheel and switch are arranged so that immediately after a printing operation at station A as the carriage **64** starts its forward movement, the switch **83** will be opened, deenergizing solenoid **80** and effecting feed of a fresh section of material **60** for the succeeding printing operation. As will be explained in detail hereinafter, when the machine is set up so that certain printing plates are not printed at station A, control of solenoid **80** by switch **83** as these specified plates pass will be prevented by a relay in the solenoid energizing circuit which by-passes alternately actuated switch **83** and maintains solenoid **80** continuously energized. This relay is controlled by switches in the delay mechanism. The specific timing and energization of the solenoid **80** will be described in the overall description of the operation given hereinafter.

After each successive printing operation of the station A, the material **60** will be fed forward to present a clean printing surface for the next printing actuation. After leaving the printing station A, the material runs forward out of the machine beneath a reciprocating cutting knife indicated generally at **85**. This knife is actuated by a crank **86** suitably connected to a solenoid **88** to cut the material **60**. As each three inches of material **60** is fed by operation of the carriage **64**, the cutting knife **85** will cut off the outermost three inches to form a 3x5 card having a single name and address printed thereon. These cards are collected in a compartment **87** located beneath and in front of the cutting knife **85**.

In the printing performed at printing stations B and C, a strip of paper material is intermittently fed beneath the platen **50**. The strip paper **90** for these two printing stations is fed from a supply roll (not shown) to rollers **91** mounted in bearing blocks **92** which are urged upwardly by supporting springs **93**. Thus the rollers **91** press the paper upwardly into engagement with feeding rolls **94**. The feeding rolls **94** are journaled on a shaft **95** which is rotatably mounted in the main frame **1** and intermittently driven by a pawl and ratchet mechanism (not shown) interposed between the bell crank **7** and the outer end of shaft **95**. Thus oscillation of bell crank **7** effects stepped rotation of shaft **95**. Retarding brakes **96** are rigidly secured so as to cooperate with the feeding rolls **94** to restrict the turning of such rolls in feeding the paper **90**.

It will be readily recognized that under control of the notches located along the edge of each address printing plate, each of the plates may not be caused to be printed at each of the three printing stations A, B and C. Thus one or another of the printing stations may remain idle

while one or more plates move beneath its platen 50 while passing through the machine. In printing the strip material, it is desirable that each space on the material contain a name and address from one of the plates. If the material were continuously fed through the machine in the absence of actuation of the printing head, blank spaces would appear on the strip material. Such a result is not to be desired. Accordingly, at printing station A the solenoid 80 is continuously energized to prevent the material 60 from being fed when no printing has taken place at the printing station A.

Similarly means are provided in coupling the feeding rolls 94 for stations B and C to insure that the paper 90 will not be fed when a printing action has not taken place at the respective printing station. To effect this desired operation, a ring 97 is secured to rotate with the shaft 95. This ring is provided with lugs 98 which engage with recesses in ring 99 slidably mounted on the shaft 95. The adjacent ends of ring 99 and feed roll 94 are provided with cooperating clutch teeth 100. When these teeth are in engagement, the ring 97 driving ring 99 will transmit rotation to the feeding roll 94.

To disengage the clutch teeth 100, an annular groove 101 is formed in the outer surface of the ring 99. One end of a pivotally mounted lever 102 cooperates with the groove 101 to permit axial movement of the ring 99 so as to disengage the clutch teeth 100. Springs 103 are connected to the respective levers 102 so as to normally urge the clutch teeth 100 into driving engagement. Adjustable links 104 are pivotally connected to the upper ends of the levers 102 to connect such levers respectively with actuating solenoid 105 for printing station B and 106 for printing station C.

It will be seen that energization of the respective solenoids 105 and 106 will effect disengagement of the clutch teeth 100 and thus prevent transmission of the driving force of shaft 95 to the feeding rolls 94. Further, upon energizing one or both of these solenoids, a locking pin 107 secured to each lever 102 will move into engagement with radial slots 108 formed in the periphery of the feeding rolls 94. Thus when one of the solenoids is energized not only will the clutch teeth 100 be disengaged, but the locking pin 107 engaging with a radial slot 108 on the feeding roll 94 will prevent any undesired movement of the feeding roll 94.

The timing and energization of the solenoids 105 and 106 to control the feed of paper 90 for printing stations B and C, respectively, will be described in detail in the overall description of the operation set forth hereinafter.

As noted above, the printed strip paper 90 fed from printing station B will be moved to a cutting knife (not shown) which, after every twenty printings at such station, will cut the strip paper into individual strips having a length corresponding to twenty address plate printings. Such strips after cutting will be collected in a bin 110 shown on Figure 2. The material as printed at station C is fed forward and wound onto a reel 111 driven by a belt means 112 connected to suitable driving pulleys (not shown). To properly draw the material fed from the printing station A, a tensioning roller 113 mounted on a rod 114 driven by a belt 115 is positioned forwardly of the printing station. The belt 115 is driven by a pulley 116 mounted on the main drive shaft 2.

An important and essential feature of this invention is the effective application of photoelectric sensing means used for discerning the location of the notches carried along the edge of each of the printing plates. As described hereinabove, the specific location of these notches is used in controlling the operation of the machine to perform the printing or sorting of the plates as they pass through the addressing machine. Since the sensing operation to be performed on each of the plates is a basic and essential part of obtaining effective operation of the machine as a whole, it becomes extremely important, particularly under high speed operation, to have an accurate and effective sensing operation of the notch locations to dictate to the machine the operations to be carried out with each particular printing plate.

Beneath the bed or path of movement of the address printing plates P from the magazine 20 to the collecting racks R and E, a light source L is secured to the side of the main frame 1 so as to direct rays of light upwardly toward the path traversed by the printing plates. This light source is provided with a lens so as to concentrate and direct the rays of light into a beam at the point of passage of the printing plates P along the bed of the machine. These rays of light from the light source L in the absence of a plate positioned on the bed of the machine above the light source will pass through the space normally occupied by the edge of a plate upwardly to the housing H which contains the detecting photoelectric cell.

A pair of adjustably mounted plates 120 and 121 are secured to the upper surface of the guide 37 above the path of the address plate to form the light into a V-shaped beam. The diagonal edge 122 of the plate 121 is effective upon movement of an address printing plate P through the sensing station to insure that as a V-shaped notch in the edge of the plate P moves past the diagonal edge 122, a sharp pulse of light will be transmitted to the photoelectric cell in housing H. Since the plate in normal operation of the printing machine will move swiftly through the sensing station, it is desirable that a pulse of clear-cut proportions be transmitted to the photoelectric cell. It has been found that by properly angling the diagonal edge 122 of plate 121 to correspond with the usual angle of an edge of a V-shaped notch in the address plate P, the instant the edge of the notch in the plate P passes the edge 122, an effective usable light pulse will be sent to the photoelectric cell. Although the use of plates 120 and 121 may be desirable with certain less sensitive receiving circuits and accurate notch size and positioning, it has been found that a simple slotted plate may be substituted where more sensitive and quickly responsive electronic circuits are employed in intepreting the electric pulses sent by the cell when it receives the light pulse from a notch along the edge of a plate.

In sensing the location of the notches along the edge of a particular address plate, a photoelectric cell must receive pulses of light from the light source L for each notch along the edge of the plate. However, in the absence of a plate moving through the sensing station, or during the space between the plates, the photoelectric cell should not receive light from the light source L. Accordingly, a suitable shutter mechanism is provided within the photoelectric cell housing H to open and close the aperture admitting light to the housing. The shutter mechanism is controlled by a trigger 130 connected to the shutter mechanism and extending through an opening 131 in the supporting strip 35 so as to be engaged by the end of an address printing plate P as it moves along the bed of the machine. Thus as plate P engages the trigger 130, the shutter mechanism in the housing H is opened, and as the end of the plate passes from beneath the trigger 30, the trigger will allow the shutter to close to prevent light from entering the housing H during the space between successive printing plates.

Prior attempts to develop a sensing means suitable for reading the notch locations along the edge of the address plates have resulted in the adoption of sensing devices which require that the plate be momentarily stopped during its movement through the machine from the supply magazine to the final collecting racks. Obviously, if the speed of operation of the machine increases, time available for momentarily stopping the plate at the sensing station is proportionately reduced. In fact, in the higher speeds of operation it is impossible to obtain accurate and efficient reading of the successive address plates by attempting to momentarily stop the plate to perform the reading at a location along the path of travel of the address plate.

The sensing means of this invention utilizes a photoelectric cell which receives light pulses from a light source as the notches along the edge of a plate pass between the cell and the light source. Thus in the sensing means of this invention the individual address plates are sensed or read as they move between the light source and the photoelectric cell. There is no stopping of the plates to perform the sensing function or even slowing down of the speed of travel of each plate to read the notch locations. Accordingly, by sensing the notch locations as each plate moves past the sensing station, the addressing machine of this invention is capable of very high speed operation and thus not subject to the limitations of the presently available machines wherein each plate must be halted to perform the sensing operation.

As previously discussed in the particular embodiment shown by way of example, each of the address plates has twenty-four possible locations for V-shaped notches along the longitudinal edge thereof. A plate having the entire twenty-four locations notched, in moving between the light source and the photoelectric cell, would send twenty-four pulses of light to the photoelectric cell, each pulse following the preceding one in point of time as the plate moves past the sensing station. A plate having one or any combination of notches at various positions along the edge thereof in passing between the light source and the photoelectric cell would permit light pulses to fall on the photoelectric cell spaced in time in proportion to the distance that the respective notches are spaced from the leading edge of the plate which opens the shutter for the housing H. Since each notch along the edge of a plate will permit the same magnitude of light pulse to fall on the photoelectric cell, the various time spaced pulses must be distinguished by the extent of movement of the plate through the sensing station.

As previously described, the plates are individually removed from the stack in magazine **20** and pushed past the sensing station and on through the addressing machine by rails **25** and **26** carrying push pawls **27** thereon. Thus the movement of rail **25**, for example, controls the movement of each plate through the sensing station.

The rail **25** extends rearwardly and has connected to the outer end thereof a member **135** having ends **136** bent at right angles thereto. A cable **137** is adjustably connected by threaded connectors **138** between the ends **136** with an intermediate portion of the cable encircling a knurled drum **139**. A spring **140** is interposed between one end of the cable **137** and one of the threaded connectors **138** to maintain a uniform tension on the cable **137**.

The knurled drum **139** is journaled on a hub **141** having an integral flange **142**. The hub **141** and its flange **142** are in turn rotatably supported on a stub axle **143** which is suitably secured by appropriate members bolted to the main frame **1** to retain the axle with the axis thereof vertical. The lower end of the axle **143** is provided with an enlarged end **144** to retain the hub **141** and flange **142** on the vertical axle **143**. The flange **142** carries an integral cylindrical portion **145** extending downwardly and concentrically to the axis of the vertical axle **143**. A spring pressed retarding brake **146** is secured to the supporting members connected to the main frame **1** and engages the outer surface of the cylindrical portion **145** to retard rotation of the hub **141** on axle **143**.

It will be readily appreciated that reciprocation of the rail **25** carrying the member **138** will impart through the cable **137** engaging drum **139** oscillation of the drum **139** upon the hub **141**. The retarding brake **146** engaging the outer cylindrical surface of portion **145** serves to prevent the hube **141** and flange **142** from being rotated by friction between the drum **139** and these two parts.

As shown more clearly in Figure 6, the peripheral surface of the drum **139** is provided with a notch **150** to be alternately engaged by one of a pair of pawls **151** pivotally mounted on the upper surface of the flange **142** on pins **152** and urged into engagement with the surface of the drum **139** by springs **153**. Forward movement of rail **25** causing counterclockwise rotation of the drum **139** as viewed in Figure 6, will result in the notch **150** being engaged by one of the pawls **151** to thus impart rotation to the hub **141**, flange **142** and cylindrical portion **145**. Likewise returning movement of the rail **25** effecting clockwise rotation of the drum **139** will result in the pawls **151** riding free of the notch **150**, so that the hub, flange and cylindrical portion will not be rotated in the clockwise direction.

Keyed to the lower end of the cylindrical portion **145** is a rotary switch **160**. The axis of this rotary switch is aligned with the axis of the vertical axle **143** and is provided with a diagonal pin **161** engaging in diametrically opposite notches in the end of the cylindrical portion **145**. The body of the switch is suitably mounted on the members secured to the frame **1**.

The rotary switch **160** carries a pair of radial contactors **162** secured to and insulated from the vertical switch axle which contactors extend from diametrically opposite sides of the switch axle. Arranged around the periphery in an 180° arc are 25 separately insulated contacts **163** to be engaged successively by the movable radial contactors **162**. To preclude reverse rotation of the rotary switch a notched disc **164** is mounted on the axle **165** of the switch. A strip spring **166** mounted on the base of the switch engages the notched periphery of the disc **164** to prevent reverse rotation of the rotary switch.

A conducting ring **167** is mounted between the spring arms which form contactors **162**. This ring carries a radial arm which connects with a contact mounted on the body of the rotary switch in the plane of the radially disposed contacts **163**. The ring **167** through its connection with the contact on the body of the switch serves as the electrical lead-in for the contactors **162**. Although a specific form of rotary switch has been illustrated, it will readily be appreciated that any suitable rotary multiposition switch may be substituted within the scope of this invention.

From the above-described structure it will be apparent that reciprocation of the push rail **25** to move the printing plates through the machine will effect through the cable **137** oscillation of the drum **139**. This drum **139** through the ratchet and pawl connection provided by notch **150** and pawls **151** will effect intermittent rotation of the rotary switch **160** through the key drive of pin **161** engaging the notches in cylindrical portion **145**. As each notch position of a plate moves between the photoelectric cell and the light source, the rotary switch **160** will be moved by reason of its connection with the push rail **25** so that one of the contactors **162** will successively engage the radial contacts **163** mounted around the periphery of the rotary switch. Thus in effect each contact **163** represents a different notch position on the printing plates. Since the rotary switch **160** is rotated 180° on each push rail reciprocation, two radial contactors are provided, one successively engaging contacts **163** on one 180° arc rotation and the other engaging the contacts on the succeeding 180° arc of switch rotation.

Although in every case the positioning of the notches along the edge of each plate is read or sensed at the beginning of movement of the plate through the machine, the data conveyed by the notch locations may indicate that the particular plate should not be printed at any of the three printing stations. Likewise this information may indicate to the machine to separate the plate from those plates in the regular collecting rack R by sending the plate into the rack E. Thus, although each plate in passing through the printing machine is sensed at the same location, the notch locations along the edge of a plate may result in each plate being used differently throughout the travel of the plate through the machine. Accordingly, means must be provided for storing the data determined from the plate at the sensing station and

effecting operation of the appropriate printing station or sations and/or sorting mechanism when the plate reaches the location of such station or mechanism in its travel through the machine.

A delay mechanism **170** is mounted at the left side of the machine as shown in Figure 1. This mechanism has a shaft **171** extending therethrough with suitable gearing **172** interconnecting the inner end of the shaft with drive shaft **2** so that the former will rotate in the same direction as the latter. Thus the shaft **171** is rotated in timed relation to the main drive shaft **2** by the gearing **172**.

The delay mechanism **170** is cylindrical in cross section as specifically shown in Figures 16 and 17 with the shaft **171** extending axially therethrough. The mechanism **170** is made up of four similar sections, one section for each of the three printing stations A, B and C, and the fourth section for the sorting mechanism used in separating plates into the collecting rack E. Each of the sections are substantially identical in operation and construction, and accordingly on the drawings the details of a single section, i. e. the outermost section which controls station A, have been shown on Figures 15 through 18. It will be understood that each of the other sections of the mechanism **170** are substantially identical to the section shown on these figures.

A cylindrical casing **175** encloses the four sections of the mechanism **170** and is provided at the outer end with a disc cover **176**. A plurality of supporting rods **177** extend longitudinally immediately inside the casing **175** at spaced positions around the periphery of the casing and serve to support and properly position annular separating plates **178**. The casing **175** and the supporting rods **177** carried thereby are suitably mounted on the main frame **1** by appropriate members bolting the parts to the frame.

The outer end of the rods **77** extend through the disc cover **176** and support inwardly thereof a disc **179** having a central bearing **180** which serves to rotatably support the outer end of the shaft **171**. At spaced positions along the length of the shaft **171** four wheels **181** are secured to the shaft **171** so as to rotate therewith. These wheels are positioned along the shaft at the location of the annular spacing plates **178** and serve to form the four sections of the delay mechanism **170**.

Each wheel **181** carries six slidable pins **182** spaced around the periphery of the wheel with the axes thereof parallel to shaft **171** and equidistant from the axis of such shaft. These pins are provided with a pair of circumferential grooves **183**. The outer periphery of each wheel **181** is formed with a V-shaped groove, the bottom of which intersects the bores which carry the pins **182**. A spring **184** is positioned in this groove around the circumference of each wheel **181** and by engaging one or another of the grooves **183** on the pins **182** will retain such pins in the position to which they are moved by the appropriate actuating mechanism to be described.

In the outermost section, for example, a solenoid **185** is mounted on the plate **179** in the space between such plate and the outermost wheel **181** of the information storing mechanism. As shown most clearly in Figure 18, the solenoid **181** carries a pivotally mounted L-shaped lever **186**, one end of which is connected to the armature **187** of the solenoid and retained in retracted position by spring **188**. The other end of the lever **186** carries a pin actuating member **189** which in the normally retracted position of the lever lies parallel to the axis of the solenoid. The pin actuating member **189** is positioned by proper location of the solenoid on the plate **179** so as to be movable into engagement with the pins **182** mounted in the adjacent wheel **181**.

The energization of the solenoid **185** is controlled by data obtained from the notch locations on the plate edge at the sensing station of the machine. On energization of the solenoid **185** the lever **186** and member **189** carried thereby are moved into a position to actuate one of the pins **182** slidably mounted in the wheel **181**. By such engagement, together with the continued rotation of the wheel **181** during machine operation, the pin **182** will be moved so that the opposite end thereof will extend from the other side of the wheel **181**.

As shown more clearly in Figure 16, a pair of suitable switches **190** and **191** are mounted on the other side of the separating plate **178** with the switch arms **192** carrying rollers **193** positioned in the path of movement of the slidably mounted pins **182** on the wheel **181**. Thus a pin moved by energization of the solenoid **185** to project from the opposite side of the wheel **181** will upon continued rotation of the wheel **181** successively engage the respective rollers **193** and close the switches **190** and **191**. As will be described hereinafter, the switches **190** and **191** are appropriately connected with the actuating mechanisms of the machine to control the operation of such mechanisms in handling the printing plates.

As the wheel **181** continues to rotate with the shaft **171**, the pin which was moved by the actuating member **189** and then in turn caused closing of the switches **190** and **191**, will be carried around by the wheel and will engage a clearing plate **194** secured to the annular dividing plate **178** with the surface thereof lying in a plane diagonal to the surface of the wheel **181**. The rotation of the wheel **181** carrying the pins **182** past the plate **194** results in those pins which project from the switch side of the wheel **181** being returned to the position where they project from the solenoid side of the wheel **181** in readiness for a subsequent actuation by energization of the solenoid **185**.

From the above-described structure, it will be clear that the solenoid **185** which is representative of any of the solenoids mounted in the four sections of the mechanism **170** will move a pin **182** upon energization to project from the opposite side of the wheel **181**. The movement of this wheel is timed to the speed of operation of the machine by the gearing **172** which interconnects shaft **171** and the main drive shaft **2**. Accordingly, as the plate which has been read at the sensing station is moved along the bed of the machine, the wheel **181** will rotate proportionately with the movement of the printing plate. Thus, when the plate reaches the proper location in the machine for printing or sorting, the actuated pin **182** will have moved to engage the first switch **190**, and on continued movement of the printing plate, into engagement with the second switch **191**. The function of these two switches will be described in detail hereinafter. As the machine continues to operate, with shaft **171** turning the wheels **181**, the actuated pin **182** will eventually be cleared by engagement with the clearing plate **194** to return the pin in readiness for the next actuation by solenoid **185**.

As previously noted, the outermost section of delay mechanism **170** illustrated in Figures 15 through 18 controls printing station A. The printing plates reach station A immediately after leaving the sensing station upon the next reciprocation of the push rail **25**. Accordingly, the shortest delay is required for this station between sensing or reading the plate and printing at the station. Therefore the switches **190** and **191** are located closely adjacent the position of the pin actuating solenoid **185** and are closed successively by an actuated pin **182** upon only a small arc of rotation of wheel **181**.

On the other hand, the printing stations B and C and the sorting mechanism require proportionately longer delays between sensing of the printing plate and printing or sorting at the station. Thus it will be understood that the switches **190** and **191** in the sections of mechanism **170** which control printing stations B and C will be spaced from the actuating solenoid **185** proportionately to the distance that the plate must travel between sensing and printing at the respective station. With such greater spacing an actuated pin **182** will move through a greater arc after actuation before successively closing the switches **190** and **191** or, in the case of the fourth section controlling the sorting mechanism, the single switch **190**.

As shown in Figure 1, the shaft **171** carries a wheel **195**

having six fixed pins mounted at equally spaced radial positions around the periphery thereof. These pins, upon rotation of the wheel **195** successively actuate an ejecting mechanism which insures that every printing plate which reaches this extreme point in travel through the machine will be ejected into the rack E designed to receive the plates of those addressees whose subscriptions are expiring or to be terminated.

A similar wheel **196** is secured to the shaft **171** above the collecting rack R. This wheel, however, carries six slidably mounted pins **197** at equally spaced radial positions around the periphery thereof. These pins normally extend from the right side of the wheel **196** as shown in Figure 1, but may be actuated by a solenoid **200** engaging an actuating spring lever **199** to extend from the left hand side of the wheel **196**. Rotation of the wheel **196** results in the actuated pin being returned to its normal position of extending from the right side of the wheel by engagement with a clearing cam **198**. The pins **197** in their normal position successively engage an ejecting mechanism which effects ejection of each plate at this point of travel in the machine into the collecting rack R which receives the plates of the addressees whose subscriptions are to continue. However, a plate which is to be moved into the collecting rack E as determined by reading the notch locations at the sensing station, must pass beneath the ejecting mechanism for the collecting rack R over to the ejecting mechanism for the collecting rack E. To obtain this result the solenoid **200** will be energized at the proper time to effect through lever **199** movement of the proper pin **197** to extend from the left side of the wheel **196**. When this pin location moves to the point where it would normally engage the ejecting mechanism, while the plate has moved through the machine toward the collecting rack, the actuated pin **197** will be out of position to engage the ejecting mechanism, the ejecting mechanism will not be actuated, and the plate will continue along the bed of the machine to be engaged by the second ejecting mechanism to send this plate into the collecting rack E.

Figure 19 of the drawings generally illustrates a schematic diagram of the interconnection between the various parts of the apparatus. In an endeavor to simplify the illustration of the circuits connecting the elements of the machine, the showing of Figure 19 has been illustrated in its simplest possible form, substituting electromechanical relays for the more desirable electronic circuits. This showing has been done solely for simplification of the description of the machine, and it will be readily understood that in high-speed operation of such a printing machine the time lag and relatively slow actuating speed of electromechanical relays would make their use impractical. As the description of Figure 19 proceeds, reference will be made to the various electronic circuits which for a high-speed machine would be used in place of the more slow-acting relays illustrated for purposes of description on Figure 19.

Referring specifically to Figure 19, the light source L directs rays of light upwardly past the path of movement of the printing plate P so as to be interrupted by the edge of the plate. A detecting photoelectric cell **201** is mounted above the path of movement of the address plates P. Thus as the edge of the address plate passes between the light source L and photo tube **201**, the notches along the edge of the plate will permit light pulses to fall on the photo tube. These light pulses create in the photoelectric cell electric surges which are suitably amplified by an amplifier **202**. The amplified output from amplifier **202** is applied to a keying circuit illustrated in the form of an electromechanical relay **203** so that as each light pulse falls on the photoelectric cell the relay **203** will be closed. The contacts of the relays **203** are connected into the output circuit of an oscillator **204** to enable coupling of the oscillator output to the rotary switch **160**.

In operation of the address printing machine each plate passes between the light source L and the photoelectric cell at a relatively high speed. Thus the pulses of light that are received by the photoelectric cell are relatively small and close together. Obviously, at higher speeds of operation these light pulses come very quickly, since the plate naturally has a faster speed of movement through the machine. Thus, although a simple electromechanical relay such as shown might be effective where the pulses are spaced far enough to allow for the mechanical time lag in operating such a relay, such a relay would not be entirely satisfactory for high-speed operation. Accordingly, the keying relay **203** would be replaced by a suitable electronic keying circuit which would be capable of the high-speed operation necessary when the light pulses are transmitted to the photoelectric cell at closely spaced intervals. Such electronic keying circuits are old and well-known in the art for their action as an electronic switch which closes a circuit when a control voltage is applied and returns the circuit to normal when the control voltage is removed. This type of circuit would enable the output of the oscillator **204** to be coupled to the rotary switch **160** even at high speeds of operation of the address printing machine. Thus such a keying circuit would accurately transmit high frequency pulses from the oscillator **204** under control of and timed with the light pulses received by the photoelectric cell as a plate speedily moves between the light source and cell.

As previously discussed, four distinct operations may be performed by the specific embodiment of the printing machine illustrated controlled by the notch locations along the edge of each plate. To enable flexibility in connecting the sensing means with the four possible operations, a separate selector board is provided for each printing station A, B and C and for the sorting mechanism actuated to collect the plates in the expired rack E.

Each selector board contains three rows of twenty-five separate jack receiving plugs. Each of the plugs **205** in the first row is electrically connected to a respective one of the twenty-five contacts **163** on the rotary switch **160**. The twenty-five plugs **206** in the second row are electrically interconnected and likewise each of the plugs **207** in the third row are electrically interconnected. As will become more apparent from the description which follows, the first row of plugs **205** may be utilized by plugging in one end of a jumper **208** and connecting the other end to one of the plugs in the second or third row. Such a jumper will thus connect one of the contacts **163** on the rotary switch **160** to the second or third rows of plugs as may be desired for the purpose to be described hereinafter.

Connected to the rows of plugs **206** and **207** for each selector board is an electrical circuit which, as will be explained, is coupled to the solenoids **185** in one of the sections of the delay mechanism **170**. Since the four selector boards, the electric circuit coupling the board to a section of the mechanism **170** and the various sections of the mechanism **170** are substantially identical, a description of only one of the coupling circuits will be given.

In the embodiment shown, the plugs **206** and **207** are connected to relay coils **210** and **211**, respectively, of electromechanical trigger relay **209** shown in place of the faster acting electronic trigger or flip-flop circuits. The relay coil **211** when energized will effect movement of the pivoted contactor **212** to engage contact **214**. Thus the relay coils **210** and **211** will alternately effect opening and closing of the relay acting as a trigger or flip-flop circuit by pivoting the contactor **212** back and forth between the pin **213** and contact **214**. The contactor **212** when engaged with contact **214** partially closes the circuit to the solenoid **185** in one section of the delay mechanism **170**. On Figure 19 a suitable power source such as a battery **215** is illustrated to provide energizing power

for the solenoids 185 in the delay mechanism 170. It will be readily appreciated that the battery 215 is shown merely by way of example and that any suitable power source may be used in performing the desired operation.

An electromechanical relay 209 has been illustrated for partially controlling the circuit to each solenoid 185 merely by way of example. As in the case of the relay 203, under high-speed operation of the address printing machine the relay 209 would have too great a time lag and accordingly would be undesirable in this respect in the present structure. In place of the relay 209 an electronic trigger or flip-flop circuit would preferably be used. This electronic circuit is in the nature of a locking or holding electronic switch as distinguished from the keying circuit used at 203. Thus in a trigger circuit the circuit remains closed or positive after the initiating control pulse despite the removal of the control voltage until a second releasing pulse is received causing the output circuit to open or become negative. Such an electronic trigger circuit would be connected in place of each relay 209 so that a pulse from oscillator 204 through rotary switch 160 if sent through a plug 206 into the electronic relay would cause the output thereof to be neutral or negative in sign, while a pulse received through a plug 207 would cause the output to be positive. This flip-flop electron tube circuit is extensively used in electronic computors, and as substituted for such relays 209 would, as in the case of two-position contactor 212, carry the sum total of pulses received at the circuit output thereof after all the pulses for a plate had been received by passage of the plate past the detecting photoelectric cell 201. In the operation of the sensing means of this invention, each printing plate is read as it moves through the sensing station. Thus the pulses created by the notches along the edge of a plate are received in spaced time relation during passage of the plate by the sensing station. The solenoids 185 for controlling the operation to be performed, i. e. either printing or sorting, should not be actuated until the plate has completely passed the sensing station and the sum total of all of the notch locations have been conveyed to the relay 209 or electronic trigger circuit substituted therefor. After the plate has passed the sensing location, the circuit to the solenoid 185 should be closed, coupling or impressing the final status of the relay 209 into the solenoid circuit. To finally close the circuit to the solenoid 185 after a plate has moved through the sensing station, a relay 220 is interposed between relay 209 and solenoid 185 and controlled by a trigger switch TS mounted adjacent the push rail 25. A pin 221 mounted on the rail 25 engages the actuating lever for the switch TS on the forward movement of the push rail 25 to close this switch energizing the relay 220 and connecting the trigger relay 209 to the solenoid 185 in the delay mechanism 170. It will be noted that the relay 220 carries separate contactors 222 on its armature which complete the circuit between each relay 209 and its respective solenoid 185 in the delay mechanism 170. The actuation of the trigger switch TS upon complete forward movement of the push rail 25 insures that the relay 220 is energized after a printing plate has been pushed completely through the sensing station. Thus the contactors 222 are not closed until the sum total of the plate notches have passed between the light source and detecting photoelectric cell to set the trigger relay 209 or electronic trigger circuit for energization or non-energization of the solenoids in the mechanism 170.

The relay 220 also has a contactor 223 mounted on the armature thereof so as to close a holding circuit for the relay through a resistance 224, reset switch RS and back to the power source 215. The reset switch RS is mounted so as to be engaged by the pin 221 carried by rail 25 upon the complete return movement of the rail. This switch in the embodiment shown contains a pair of normally closed contacts which set up the circuit for the holding of the relay 220 upon energization of such relay and closing of the contacts 223. The resistance 224 serves to reduce the current necessary to initially actuate the relay upon closure of the trigger switch TS.

By means of the holding circuit set up by closing contactor 223 it will be seen that the contactors 222 maintain the circuits to the solenoids in the mechanism 170 closed during the return movement of the push rail 25. Upon completion of this return movement the pin 221 engages the actuating lever of the reset switch RS opening the holding circuit for the relay 220 and closing a second circuit to the coil of reset relay 225. This momentary energization of the reset relay 225 by switch RS effects closing of contactors 226 carried on the armature of the relay 225 to close a circuit between the output of the oscillator 204 and the relay coils 210 of relays 209. Thus the coils 210 of each of the relays 209 are momentarily energized to reset the relays by moving the pivoted contactor 212 out of engagement with contact 214. This reset operation places the machine in readiness for reading the next printing plate to be pushed through the sensing station by the push rails 25 and 26 and pawls 27 carried thereby.

It will be appreciated that the reset switch RS momentarily closes the circuit to the reset relay 225 and returns to its normal position of partially closing the holding circuit for the relay 220. However, the momentary break of the holding circuit by opening reset switch RS deenergizes relay 220 so that the contactor 223 of the relay 220 further opens the holding circuit.

Although the specific structure shown and described with regard to the output coupling and reset of the relays 209 to apply the proper current to energize the solenoids in the mechanism 170 has been shown as comprising various electrically operated relays, it will be readily understood to those skilled in the art that upon substitution of electronic trigger or flip-flop circuits as mentioned above for the relays 209, the switches TS and RS would properly be connected so as to couple the electronic relay to impress the current on the solenoids in mechanism 170 and to reset the electronic trigger circuit by properly applying a cancelling voltage or interrupting such circuit.

The operation of the above elements set forth with reference to Figure 19 may be generally described with reference to a particular operation of the overall machine. Prior to placing the machine in operation the four selector boards will be connected up by using the desired number of jumpers 208 to set up the machine so as to handle the printing plates in the desired manner. It will readily be recognized that each of the separate plug boards will control the operation of a printing station or sorting of the plates after passage through the machine. Thus for example, the connections of jumpers 208 on the selector board for station A will determine in the final outcome which plates passing through the machine are to be printed at this station. As previously noted, in the illustrated embodiment each printing plate has twenty-four possible positions for V-shaped notches along the longitudinal edge thereof. Since the plugs 207 are connected to the relay coil 211 which operates relay 209 to partially close the circuit to the solenoid in mechanism 170, these plugs when connected to the plugs in the first row of the selector board for station A by jumpers 208 will dictate that the plate be printed by station A when it reaches this printing station. Likewise the plugs 206 connected to the cancelling or opening coil 210 of relay 209 when connected to the plugs in the first row of the selector board for station A will dictate that the plate should not be printed at printing station A.

By proper connection of the desired plugs on the selector board by use of jumpers 208, any desired operation for a particular address plate may be set up on the machine. Thus, for example, referring to the printing head A, if it be desired that every plate having a notch in the first position be printed, a jumper 208 will be connected

between the second plug in the first row on the selector board for station A and the corresponding plug in the third row on such selector board. Then after the machine is started and the printing plates are fed successively past the sensing station, every plate having a notch in the first position will send a light pulse to the photoelectric cell as the notch passes between the light source and the cell. This pulse amplified by amplifier **202** will close the relay **203** sending the oscillating current from oscillator **204** to the rotary switch **160** and its contactor **162**, which will have moved under control of the push rail **25** to engage the second contact **163** on the rotary switch. The oscillating current will thus flow on through to the selector board for printing station A through the jumper **208** to the plug **207** and thence to the relay **209** through contactor **212** and contact **214**. When the address plate pushed by the pawls **27** on rails **25** and **26** passes beyond the sensing station, the pin **221** mounted on rail **25** will close the trigger switch TS energizing the relay **220**. The contractor **222** moved by relay **220** will complete the circuit to the solenoid **185** in the delay mechanism **170** to actuate the pin **182** mounted in the wheel **181**.

The pin **182**, after being moved to extend from the switch side of wheel **181** by solenoid **185** will be carried upon continued rotation of shaft **171** into engagement with the switch **190** as the printing plate which was read reaches a point below platen **50** for station A.

In the example given above, a single jumper **208** was used to connect the second plugs in the first and third rows of the selector board for printing station A. Thus it will be seen that every address plate which contains a notch in the first position will be printed at head A under this hookup. Likewise the presence of additional notches or plates having notches other than at the first position will not be printed, since the light pulse to the photoelectric cell created by notches other than in the first position, although they will actuate the relay **203**, will not effect actuation of the relay **209**, since jumpers do not connect any of the remaining twenty-four plugs in the first row with plugs in either of the other two rows.

It will be noted that twenty-five contacts **163** for the switch **160** have been disclosed in the specific embodiment of this invention. The address plates designed for use with this machine have only twenty-four possible notch locations. In view of the fact that it may be desirable to print or not to print all plates which do not have notches along their edges, the shutter mechanism in the housing H is constructed to be operated by the trigger **130** so that a pulse of light will be received by the photoelectric cell immediately preceding the movement of the leading corner of the address plate into the path of the light source directed toward the photoelectric cell. With this construction, the first contact **163** on the rotary switch **160** is used as an initial plug on the selector boards so that a jumper connecting the first plug of the first row with the third row will set the machine to print at station A, for example, every plate passing through the machine which does not have any notches along the edge thereof.

In the example above a single jumper **208** has been used in connecting up a selector board. It follows therefrom that any number of jumpers may be used in connecting up the respective plugs in row one of a board with a plug in either of the other two rows. The connections formed by way of the jumpers **208** determine during operation of the machine the printing plates which will be printed at the station controlled by the particular board. Thus where several jumpers are used, the first may by its connection direct that all plates having a notch in the first position shall be printed at station A, while a later jumper may direct that all of the plates having a notch in the forth position shall not be printed. By such a connection all address plates having a first position notch will be printed. If such plates also have a fourth position notch they will not be printed. The existence of any other notches at other positions on the plates will have no effect on the printing at this particular station in the absence of jumpers connecting up other plugs on the board.

Although the disclosure has been directed more specifically to the printing station A, it will be readily recognized that the plug board for printing stations B and C and for sorting out the expiring address plates will be operative in a substantially identical manner, the basic difference being that each of the selector boards eventually determines the actuation of a separate one of the solenoids **185** in the delay mechanism **170**.

By reason of the holding circuit for relay **220**, the contactors **222** will maintain the solenoids **185** energized for the period of return movement of the push rail **25**. When the rail completes its return movement, the reset switch RS opens the holding circuits and deenergizes the relay **220** and thus the solenoids **185**. By maintaining the solenoids **185** energized for this period, the pins **182** carried by wheels **181** will be rotated to be moved into engagement with the actuating member **189** and pushed axially through the wheel **181**. Thus it is not necessary to utilize a solenoid at **185** which has power enough to effect axial movement of pins **182** on energization. Instead the actuating member **189** is moved into position after which the pin **182** carried by rotating wheel **181** sweeps into engagement with the member **189**.

The timing of the various operations at each printing station will now be described as basically controlled by the switches **190** and **191** in the delay mechanism **170**. In printing, feeding and cutting at the station A, the closing of switch **90** to actuate a latching relay (not shown) energizes the solenoid **56** to drive the platen **50** at printing station A downwardly and effect printing on the material **60**.

When the machine is operating without printing the plates passing the station, the solenoid **80** is continuously energized to prevent the knurled roller from engaging the material **60** and effecting forward feed of such material. However, when the switch **190** is closed to energize the latching relay, a pair of contacts on such latching relay open the circuit to the solenoid **80**, and the alternatively closed switch **83** controls the circuit for energizing the solenoid. Therefore, as the high portion of the cam **82** maintains the switch **83** closed, the solenoid **80** will be energized, lifting the knurled roller **75** from engagement with the material **60**. This period of energization of solenoid **80** continues during the entire return movement of the carriage **64**. When the low portion of the cam **82** permits the switch **83** to open, the solenoid **80** is deenergized so that the knurled roller **75** engages the material **60**. This deenergization continues during the forward movement of the carriage **64** to effect feed of the material **60** and is timed by the relationship of the cam **82** to the other linkages of the machine so as to effect feed immediately after printing platen **50** at station A has been energized by the switch **190** closing the latching relay.

At the end of the full forward feed of the material **60**, the cut-off knife **85** is actuated to cut off a three-inch portion of the strip material to form a 3 x 5 card and deposit such card in the container **87**. Outwardly of the gear section **14** on shaft **11**, a disc **235** having a cam projection **236** is secured to such shaft. The disc **235** and projection **236** oscillate with the shaft **11** to engage the actuating arm of a switch **237**. The position of the projection **236** is so related to the shaft **11** that such projection will engage the actuating lever of the switch **237** and close the switch when the carriage **64** has completed the forward feed of the material **60**. Closing of the switch **237** completes the circuit partially closed by the latching relay energized by closing switch **190** to energize the solenoid **238** which actuates the cutting knife **85** through the lever **86**. Subsequent to these three operations, the pin **182** closes the switch **191** which unlatches the latching relay

which was closed and latched by previously closing switch **190**.

The control of the feed and printing at stations B and C is effected by operation of the two switches **190** and **191** in the respective sections of the delay mechanism **170** for these two printing stations. In each case the switch **190** when closed by a pin **182** energizes and latches a latching relay which opens the circuit to the solenoids **105** or **106** so that the clutch teeth **100** on the paper feed will become engaged to feed the paper **90** toward the printing platen **50** for the particular station. As the pin **182** moves by rotation of the wheel **181** to close the second switch **191**, this second switch when closed energizes the solenoid **56** for the particular printing head and effects unlatching of the latching relay initially latched by closing switch **190**.

In the final section of the delay mechanism **170** which controls the plate sorting, a single switch such as **190** is mounted to be engaged by any actuated pin **182**. When such an actuated pin closes the switch **190** in this section, the solenoid **200** is energized to push lever **199** to actuate one of the pins **197** so as to extend from the left side of the wheel **196** as shown in Figure 1. As the machine continues to operate with the printing plate moving therethrough, the pin actuated by energizing solenoid **200** will move toward the ejecting mechanism for the collecting rack R. Since the pin has been moved to extend from the opposite side of the wheel **196**, as it moves past the ejecting mechanism it will not eject the plate at that point. Thus the plate will move further along the bed of the machine to the second ejecting mechanism controlled by the pins on wheel **195**. Every plate which reaches the second ejecting mechanism will be ejected into the collecting rack E which receives the address plates of addressees whose subscriptions are to expire or be terminated. It will be noted that continued rotation of the wheel **196** will move the actuated pin **197** to engage the clearing cam **198** and return the pin to extend from the right side of the wheel, as shown in Figure 1.

In the specific embodiment of the invention illustrated and described hereinbefore, one suitable circuit arrangement has been disclosed. Likewise, throughout the disclosure reference has been made to the use of address printing plates carrying V-shaped notches along the edge thereof. However within the scope of this invention as defined by the appended claims, it is contemplated that any suitable circuit may be utilized in coupling the photoelectric sensing means with the multiposition rotary switch and the actuating mechanisms for the printing and sorting wherein the printing plates are sensed while moving past the sensing station. Also it will be recognized that printing plates utilizing tabs, apertures, slots, et cetera, in place of the V-shaped notches may be used with the sensing mechanism within the scope of this invention.

To serve as an example of specific application, this invention has been described as specifically applied to address printing for mailing literature such as periodicals and advertisements to subscribing addressees. Accordingly the notches along the edge of each plate have been described as being used to convey certain data concerning the addressee's subscription. However, such a description is not to be considered as restricting in any sense, since obviously the respective notch positions or combinations thereof might appropriately be adopted by the machine user to signify any desired information concerning the lettering appearing on a particular plate which lettering need not be a name and address of an addressee from a subscription list.

In disclosing the novel features of this invention, a specific printing machine embodiment has been described. This structure sets forth three separate printing stations and a sorting mechanism. It will be readily appreciated from the description of the invention hereinbefore that a printing machine within the scope of this invention may be constructed with one, two, three or more printing stations and several sorting mechanisms all controlled by the same detecting means but provided with a separate selector board, trigger circuit and section in the delay mechanism for each such printing station and sorting mechanism.

Having thus described my invention, what I claim is:

1. In a printing machine, printing means, means for sequentially moving printing devices through said machine past said printing means, sensing means for controlling the operation of said printing means whereby impressions will be made only from certain of the printing devices, said sensing means being positioned before said printing means in the path of movement of said printing devices through said machine and having a detector determining as each printing device moves past said detector the spatial relation of the indicia carried by such printing device to the leading end of such printing device and selector means connecting said detector to said printing means for selectively determining the certain of the printing devices to be printed in accordance with the indicia carried by each such device, said selector means comprising a connector board having a row of contacts representing the possible indicia locations on said printing devices and contacts to effect printing or non-printing of said printing means, and connecting leads for interconnecting selected ones of said row of contacts with the printing contact or non-printing contact as desired whereby said selector means may be preset by utilizing appropriate connecting leads to effect printing of certain of the printing devices by said printing means.

2. In a printing machine as recited in claim 1 further characterized by a multiposition switch interposed between said detector and selector means, said switch being actuated according to movement of a printing device past said detector and connecting said detector with successive contacts in the row on said connector board as a printing device moves past said detector.

3. In a printing machine, a printing platen, actuating means for said platen, means sequentially moving printing devices relative to the platen, said printing devices having identifying means thereon, a sensing mechanism for controlling operation of the platen in accordance with the particular identifying means on the printing devices and positioned so as to receive said printing devices prior to their arrival at said platen, said sensing mechanism embodying a detector effecting a determination of the spatial relation of the identifying means carried by each printing device to the leading end of such printing device as it moves to the platen and a selector interconnecting said detector and actuating means for said platen effective by selective manipulation to determine from the identifying means on the printing devices which of said printing devices are to effect actuation of said platen, said selector having a row of separate contacts representing the successive identifying means positions on a printing device, a contact connectable to any one of the row of contacts to direct actuation of the printing platen, and a second contact connectable to any one of the row of contacts to direct non-actuation of the printing platen whereby any contact in the row of contacts may be coupled as desired to control actuation of the printing platen in accordance with the particular location of the identifying means on the printing devices.

4. In a printing machine as recited in claim 3, a multiposition switch connecting the detector with the selector, said switch being driven in timed relation to and under the control of the movement of a printing device past the detector and having contacts equal in number to and connected respectively with the row of contacts in the selector, the position of said switch at any instant connecting the appropriate contact in the row in said selector in accordance with the corresponding indicating means position on the printing device positioned at said detector.

5. In a printing machine, a printing device guideway including sensing and printing stations, means sequentially moving printing devices through said guideway and the sensing and printing stations therein, impression means for making impressions from the printing devices disposed at the printing station, said printing devices having a plurality of identifying means positions distributed thereover whereat identifying means may be provided to classify said printing devices, means to regulate the operation of said impression means whereby only printing devices having a predetermined classification will effect operation of said impression means, said regulating means embodying detecting means including a source of light, light sensitive means adapted to be influenced by light from said source, means directing a beam of light from said source past the sensing station and concentrating said beam on the successive identifying means positions on the printing device as it passes said sensing station to create light pulses spaced in accordance with the relative locations of the identifying means of the printing device, a multiposition switch coupled to said first means to be actuated in direct relation to the movement of a printing device passing said detecting means, said switch having a moving contactor successively engageable with a contact for each of the plurality of identifying means positions distributed over said printing devices, means connecting said light sensitive means to said movable contactor and means selectively coupling said contacts to control said impression means whereby impressions will be made by predetermined classifications of said printing devices.

6. In a printing machine as recited in claim 5 wherein said means sequentially moving printing devices comprises a reciprocating rail having push pawls mounted thereon to engage the end of each successive printing device in moving it through said guideway, and said contactor is mounted on a shaft to move in an arcuate path, a plurality of contacts mounted in said arcuate path to be successively engaged by said contactor in its movement through said arcuate path, a drum rotatably mounted on said contactor shaft, a pawl and ratchet mechanism connecting said drum to drive said contactor shaft in one direction of rotation, a driving cable engaging said drum and connected to said reciprocating rail whereby movement of said rail will rotate said drum and drive said contactor in its arcuate path through said pawl and ratchet mechanism.

7. In a printing machine embodying a platen and means for sequentially moving printing devices having identifying means thereon relative to the platen, the combination of a sensing mechanism for controlling the operation of the platen in accordance with the classification of the printing devices determined by the relative locations of the identifying means on the devices, said sensing means comprising a detector including a source of light, light sensitive means adapted to be influenced by light from said source, means directing a beam of light from said source past the sensing station and concentrating said beam on the successive identifying means position on the printing device during movement of said printing device past said sensing station to create light pulses spaced in accordance with the relative locations of identifying means on the printing device, and a selector capable of being set up as desired to control the platen for printing certain of the printing devices as indicated by their identifying means effective on receiving the indication of the relatve locations of identifying means from the detector to direct printing of those printing devices having the classification set up on the selector, said selector having a row of separate contacts, a first contact connected to effect actuation of the printing platen, a second contact connected to effect non-actuation of the printing platen, and means for selectively connecting said first and second contacts with selected ones of the separate contacts in said row.

8. In a printing machine as recited in claim 7, a multiposition switch interconnecting said detector and said row of separate contacts of said selector, said switch being actuated in accordance with movement of a printing device past said detector whereby each separate contact in said row will be successively connected to said detector through said switch as a printing device moves past said detector, trigger means connected to said first and second contacts alternately set to effect printing or non-printing by pulses received from said first or second contacts respectively and relay means operated on the completion of movement of a printing device past said detector to couple said trigger means to impress its output in controlling the printing platen.

9. In a printing machine as recited in claim 8, wherein said multiposition switch is a rotary switch having a contactor movable in an arc and contacts mounted around the arc of movement of said contactor to be engaged by said contactor.

10. In a printing machine as recited in claim 8 further including a second relay means operated before initiation of movement of a printing device past said detector to reset said trigger means preparatory to receiving the pulses created by the identifying means of the succeeding printing device in moving past said detector.

11. In a printing machine, a printing means including a platen, means for intermittently moving a web through said printing means whereby impressions may be made at spaced intervals on one face thereof, means for moving printing devices having a plurality of identifying means positions distributed thereover whereat identifying means may be provided to classify the printing devices, into printing position whereby impressions may be made on said web from said printing devices, means for severing sheets from the web intermediate the impressions, means for rendering said platen, said severing means and said web-moving means inoperative when predetermined of the printing devices move into printing position, and comprising a sensing mechanism embodying detecting means including a source of light, light sensitive means adapted to be influenced by light from said source under control of identifying means on the printing devices, said devices having a plurality of identifying means positions distributed thereover whereat the identifying means may be selectively provided, a multiposition switch connected to said detecting means, a selecting means having a row of contacts connected to the multiple output contacts respectively of said switch, said switch being driven by the means for moving printing devices into printing position whereby at each instant a contact of said switch which corresponds to the particular identifying means position located at the detecting means will be coupled to the detecting means, said selecting means having a first contact coupled to effect actuation of said printing means and second contact coupled to prevent actuation of said printing means, and means for selectively interconnecting said first and second contacts with selected ones of said row of contacts.

12. In a printing machine as recited in claim 11 wherein said platen is mounted for reciprocation to effect printing on the web with the selected printing devices and a solenoid effects reciprocation of said platen for printing.

13. In a printing machine as recited in claim 11 wherein said means for intermittently moving a web comprises a carriage reciprocable longitudinally of the web in the direction of web feed having a web supporting surface across which the web extends, an eccentrically mounted cylinder movable into engagement with said web to clamp the web on said surface, and solenoid actuated means mounted to rotate said cylinder out of engagement with said web during rearward movement of said carriage and into engagement with said web on forward carriage movement to effect feed of the web to the printing means.

14. In a printing machine as recited in claim 11 where-

in said means for intermittently moving a web comprises an intermittently rotated shaft, a pair of rollers grippingly engaging the web to be fed, one of said rollers being mounted on said shaft, and solenoid actuated clutch means for coupling said one roller to said shaft to effect feed of the web to the printing means.

15. In a printing machine as recited in claim 11 wherein said means for severing sheets from the web comprises a knife pivotally mounted forwardly of said printing means and a solenoid connected thereto to actuate said knife.

16. In a printing machine as recited in claim 11 wherein keying means are connected between said detecting means and said multi-position switch to transmit to said switch electrical impulses in conformity with the spacing of the pulses generated in said light sensitive means by light pulses striking said light sensitive means during movement of the provided identifying means positions on a printing device past said detecting means.

17. In a printing machine as recited in claim 11 having trigger means connected to said first and second contacts of said selecting means so that impulses received from said first contact will set said trigger means to direct printing at said printing means and impulses received from said second contact will set said trigger means to direct non-printing at said printing means, first relay means actuated upon complete movement of a printing device past the detecting means to connect the output of said trigger means to the controls for effecting actuation of said printing means, and second relay means actuated before movement of the succeeding printing device to the detecting means to reset said trigger means preparatory to the movement of the succeeding printing device through the detecting means.

18. In a printing machine as recited in claim 17 further characterized by having a delay mechanism to receive the output from said trigger means through said first relay means and effect actuation of said printing means upon arrival of the printing device to be printed at said printing platen, said mechanism comprising a shaft rotatable proportionately to the speed of machine operation, a disc mounted on said shaft to rotate therewith and having pins parallel to the axis of said shaft mounted around the periphery thereof, a solenoid energized under control of said trigger means when said first relay means is actuated and effecting axial movement of one of said pins upon energization, a switch arcuately spaced from the point of pin actuation by said solenoid so as to be closed by movement of an actuated pin into engagement therewith, said latter switch controlling the actuation of said printing means, said web moving means and said severing means as the printing device arrives at the printing means.

19. In a printing machine as recited in claim 11 further having a plurality of printing means and a separate selecting means for each printing means each coupled with the multiposition switch to control operation of a particular printing means.

20. In a printing machine which has a printing device guideway including a sensing station, means sequentially moving printing devices through said guideway and the sensing station therein, said printing devices having a plurality of identifying means positions distributed thereover whereat identifying means may be provided to classify said printing devices, a plurality of racks to receive said printing devices after passage thereof through said guideway, and means for selectively diverting said printing devices into the racks, the combination of means to regulate operation of the printing device diverting means in accordance with the classification of the printing device passing through said sensing station and embodying detecting means including a source of light, light sensitive means adapted to be influenced by light from said source under control of the identifying means on the printing devices passing between said source of light and said light sensitive means, a multiposition switch coupled to the means for sequentially moving the printing device so as to be actuated in direct relation to the movement of a printing device passing said detecting means, said switch having a contactor successively engageable with contacts representative of each of the plurality of identifying means positions distributed over said printing devices, means connecting said light sensitive means to said contactor, and means selectively coupling said contacts to control said printing device diverting means whereby predetermined classifications of said printing devices will be diverted into the racks.

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