Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

Filed June 13, 1932 8 Sheets-Sheet 1

FIG. 1

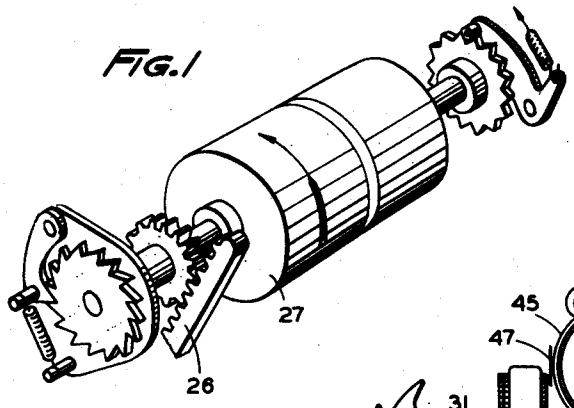


FIG. 2

Witnesses:
C. H. Killian
D. McCourtie

INVENTOR
William W. Lasker
BY Robert H. Strother
ATTORNEY

Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

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FIG. 3

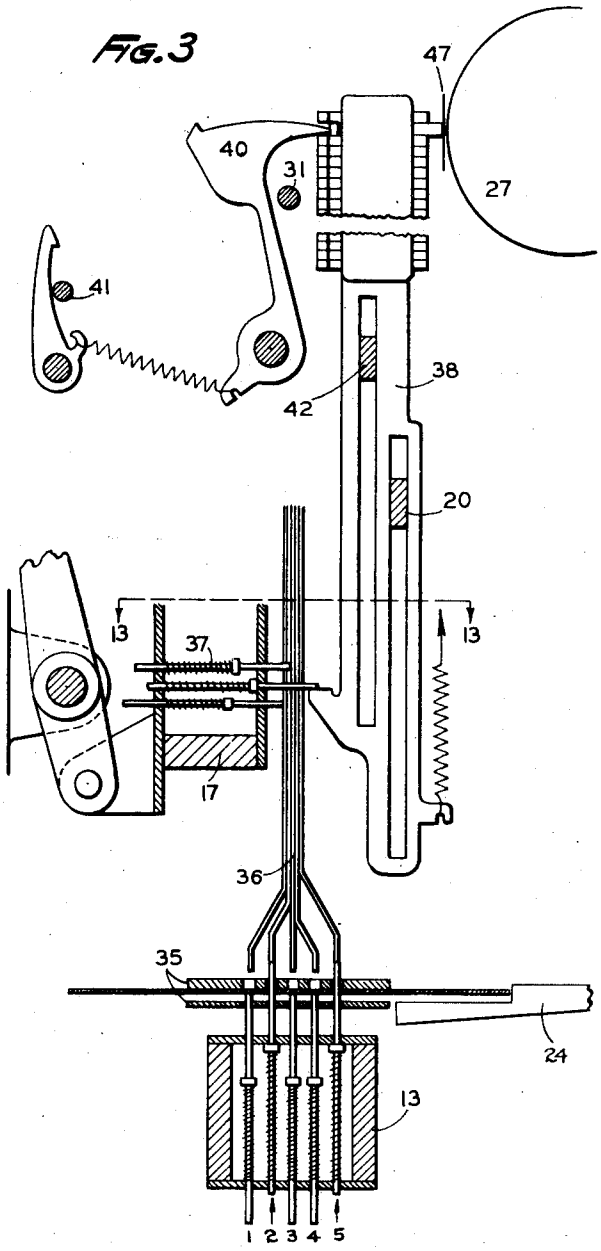
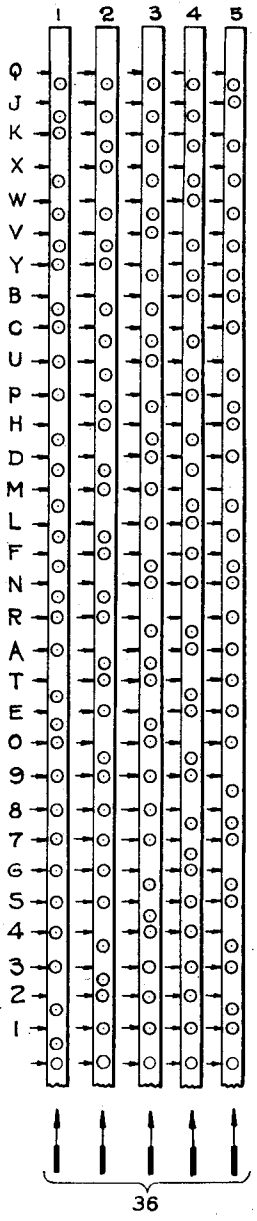


FIG. 4



Witnesses:
C. H. Killian
D. McRourke

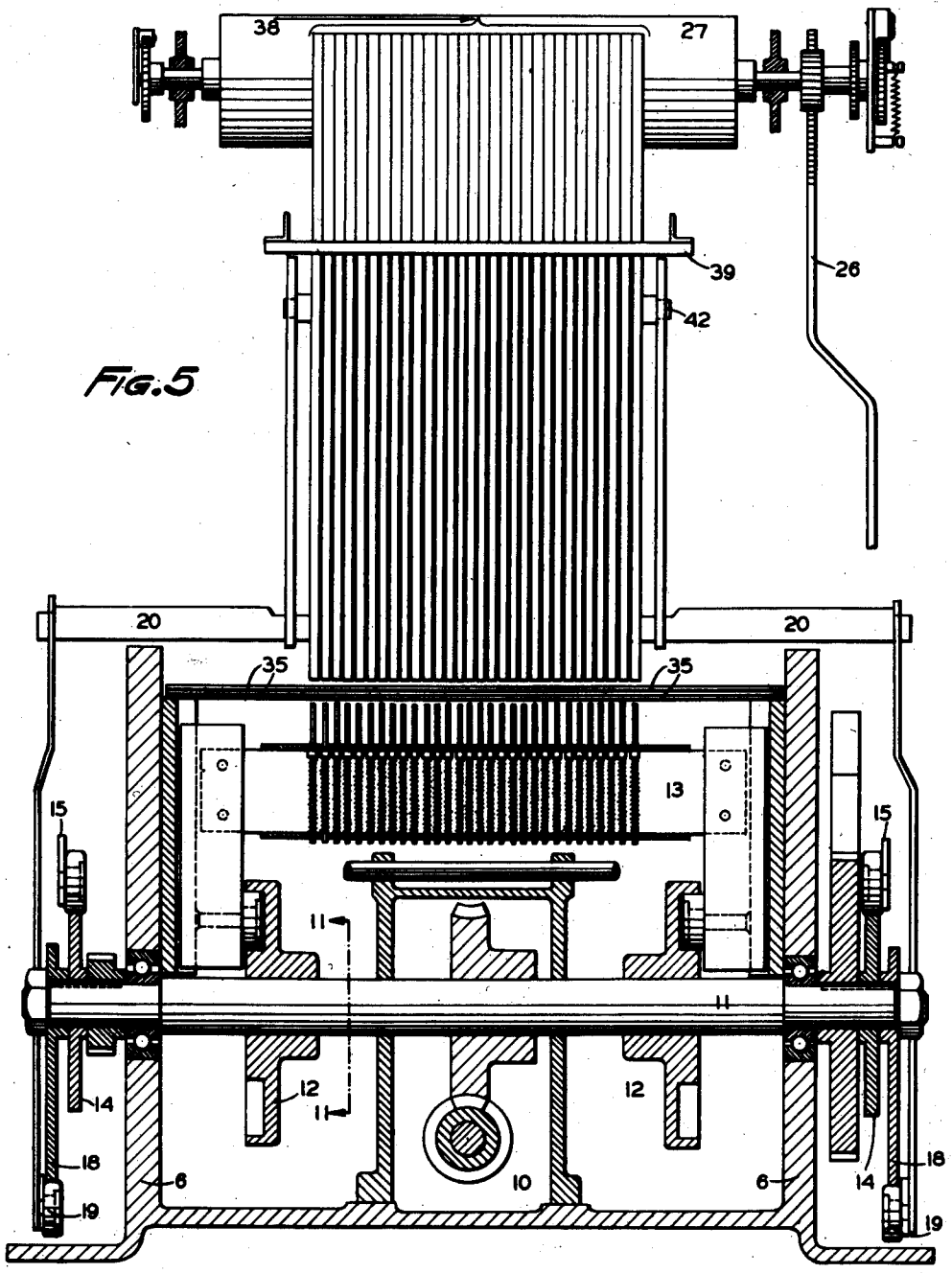
INVENTOR
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ADDRESSING MACHINE

Filed June 13, 1932 8 Sheets-Sheet 3

FIG. 5



Witnesses:
C. H. Killian
D. M. O'Rourke

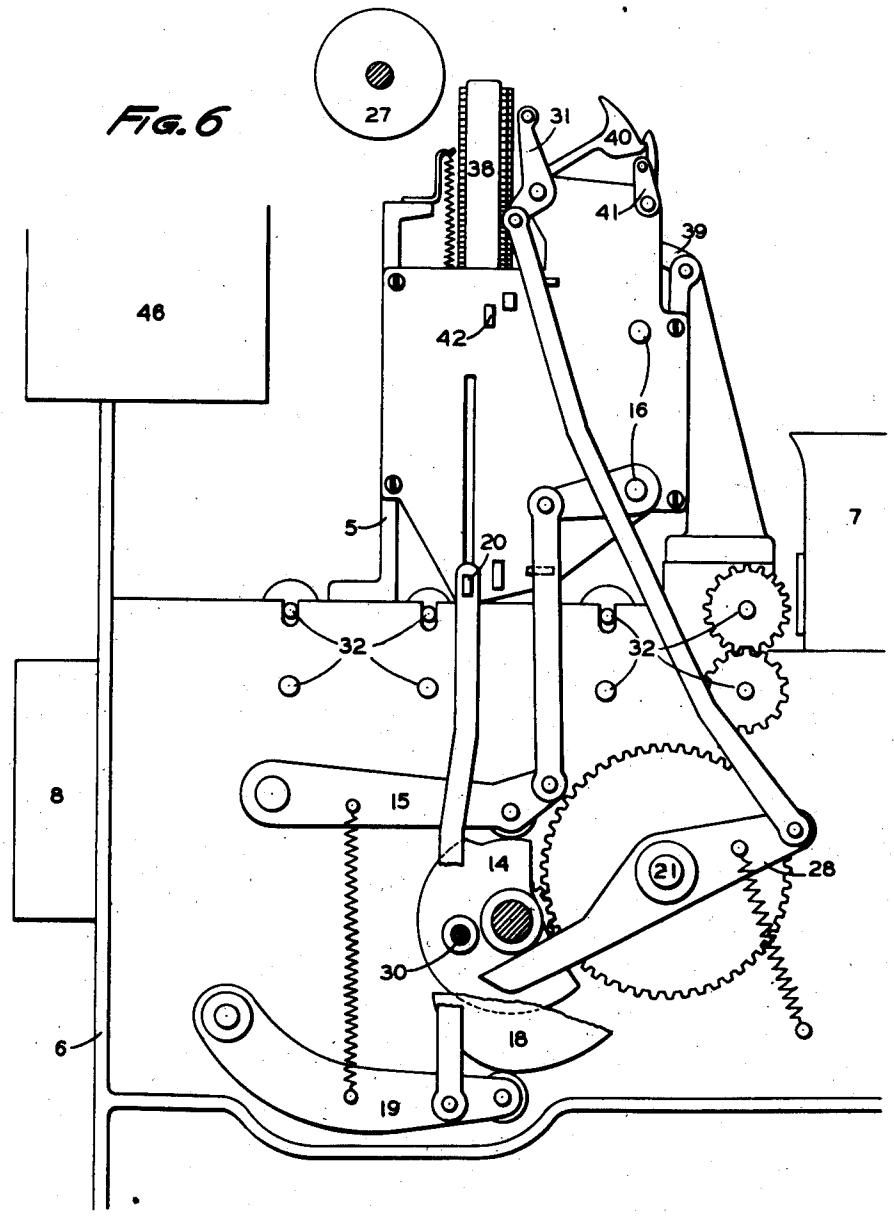
INVENTOR
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Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

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FIG. 6



Witnesses:
C. H. Killian
D. M. O'Rourke

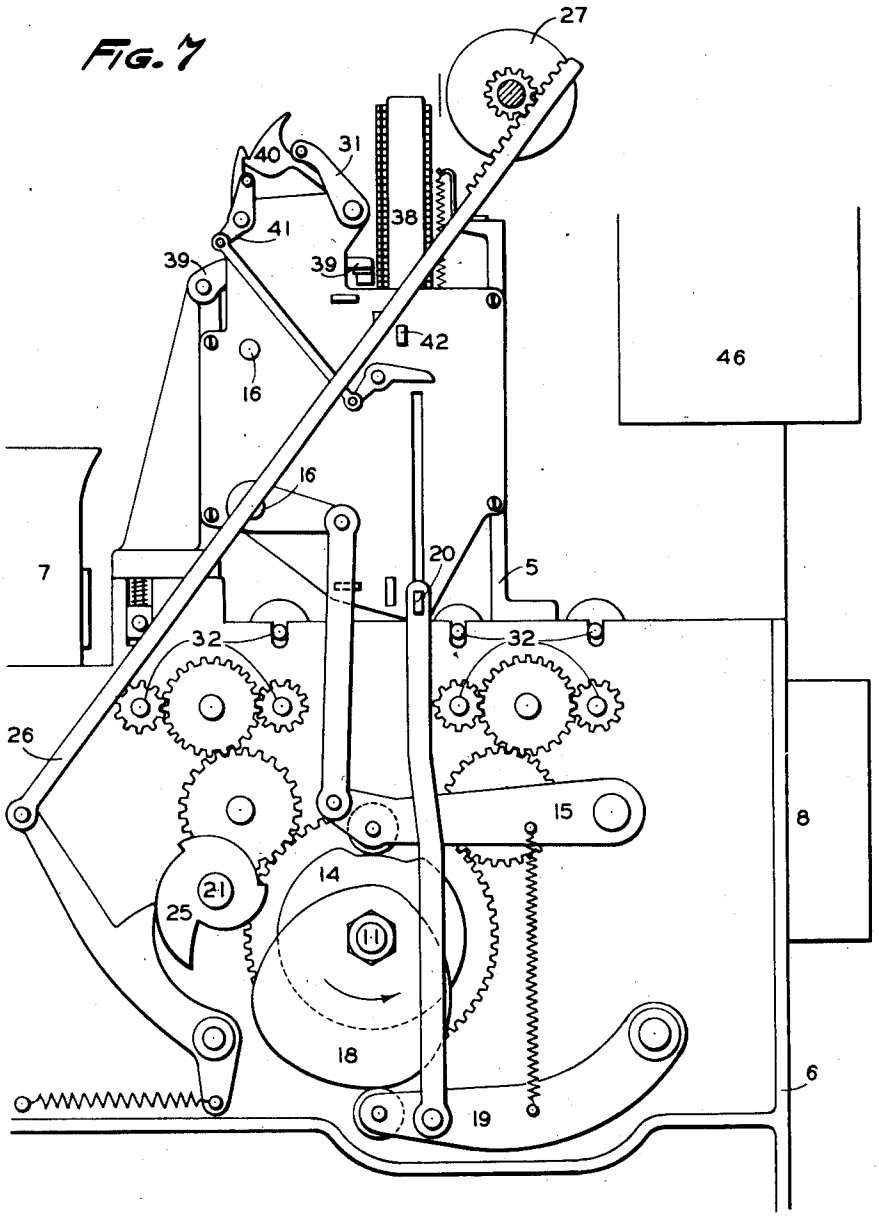
INVENTOR
William W. Lasker
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Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

Filed June 13, 1932 8 Sheets-Sheet 5

FIG. 7



Witnesses:
C. H. Killian
D. M. O'Rourke

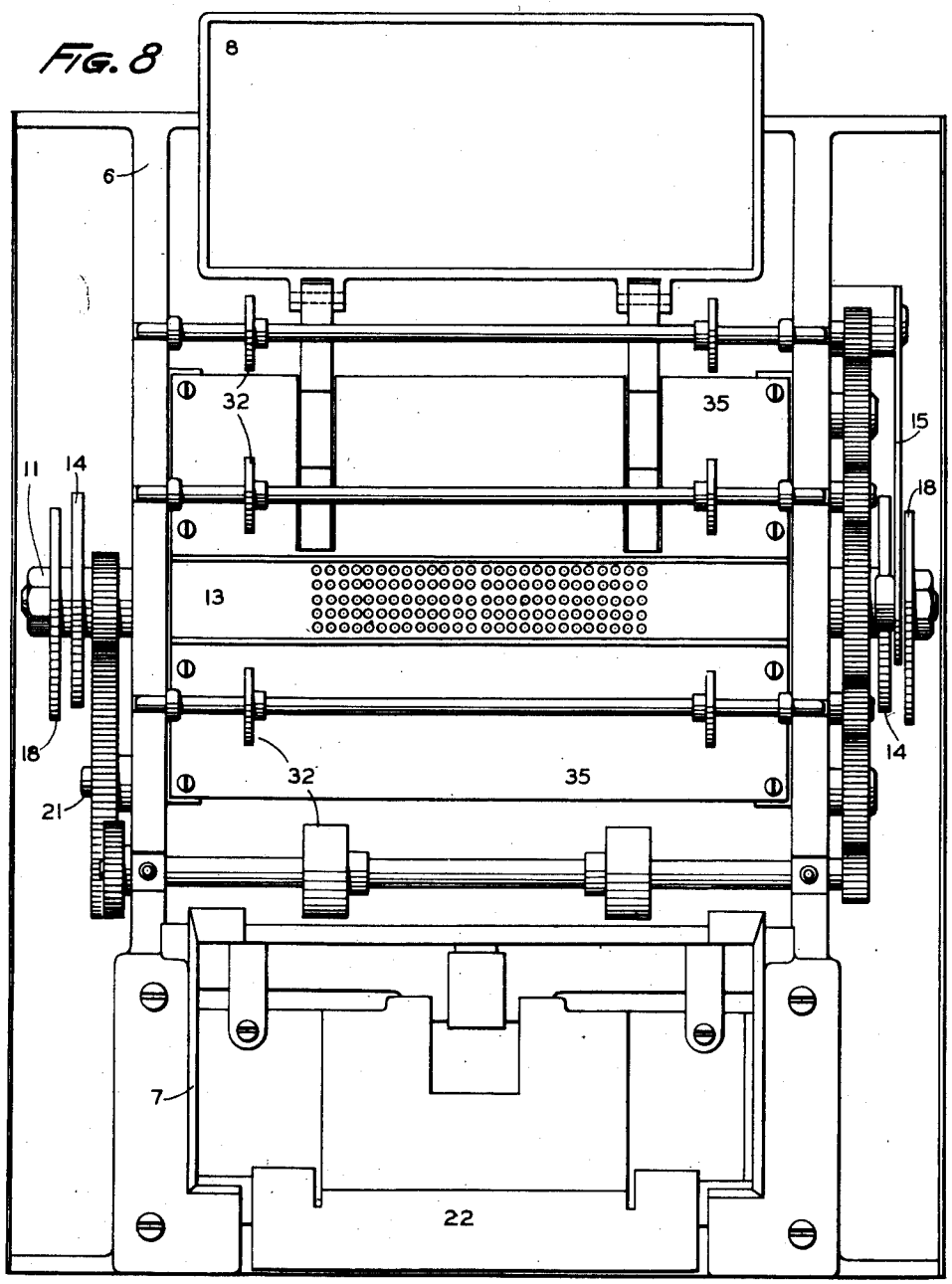
INVENTOR
William W. Lasker
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Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

Filed June 13, 1932 8 Sheets-Sheet 6

FIG. 8



Witnesses:
C. H. Killian
D. McKown

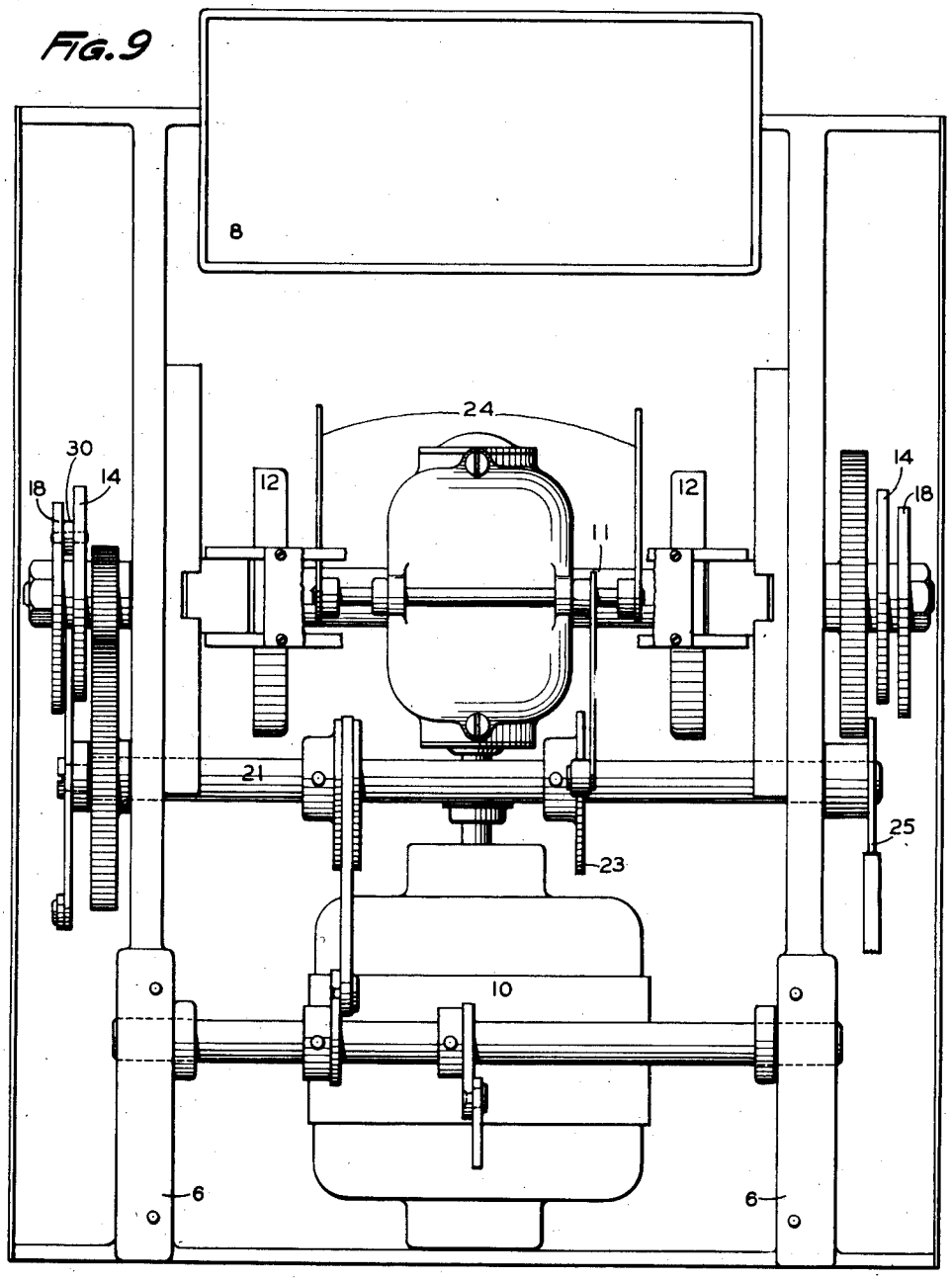
INVENTOR
William W. Lasker
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Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

Filed June 13, 1932 8 Sheets-Sheet 7

FIG. 9



Witnesses:
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Jan. 14, 1936. W. W. LASKER 2,027,916

ADDRESSING MACHINE

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FIG. 10

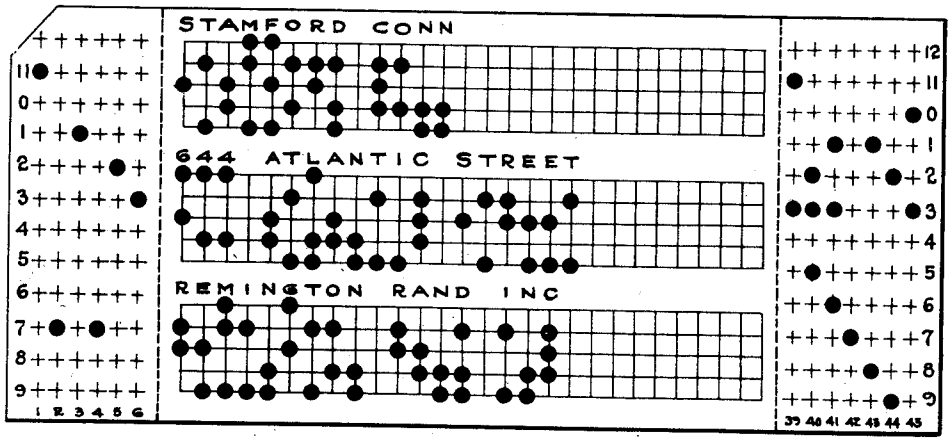


FIG. 11

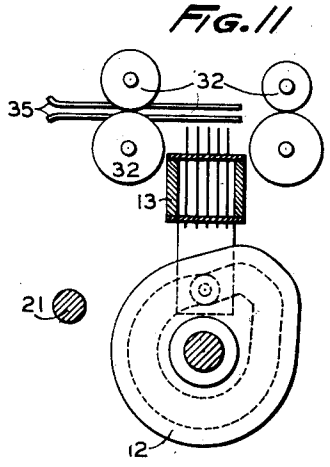


FIG. 13

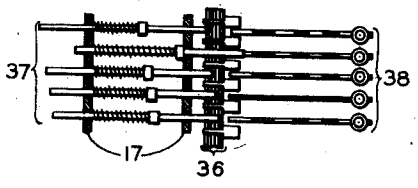
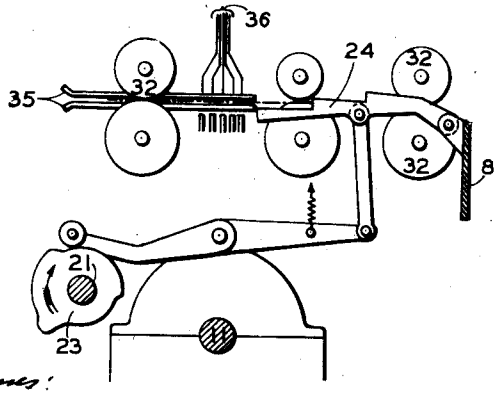


FIG. 12



Witnesses:
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D. M. O'Rourke

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BY Robert H. Shorter
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Patented Jan. 14, 1936 2,027,916

UNITED STATES PATENT OFFICE

2,027,916

ADDRESSING MACHINE

William W. Lasker, Brooklyn, N. Y., assignor to Remington Rand Inc., Buffalo, N. Y., a corporation of Delaware

Application June 13, 1932, Serial No. 616,927

12 Claims. (Cl. 101—93)

My invention relates to card controlled addressing machines for automatically printing addresses on envelopes, letter heads, and the like.

The machine comprises a series of type bars; each of which carries a set of type slidably mounted in juxtaposition to each other; displaceable relatively to each other with respect to the printing line whereby a plurality of different characters may be simultaneously printed. Each type bar carries a set of 31 type which includes all the numerals, and letters of the alphabet except that there are certain symbols which interchangeably represent either a numeral or a letter or several letters. The control or address cards are perforated according to a system which permits three horizontal fields within the width of the standard tabulating machine card, and each field is of sufficient width to permit perforations according to a fifth order combination system or five unit code.

The control or address cards are picked successively from the bottom of a weighted stack in a supply magazine, and are carried to a sensing position in which the uppermost field is sensed by a reciprocatory pin box, so that the holes thereof are translated by the pins into a setting of a group of cooperating permutation bars under the control of said pins and thence by a second set of pins into the characters arbitrarily identified with certain pre-assigned combinations of perforations. The settings of the permutation bars are sensed by a secondary pin box containing the second set of pins as a step in the process of translating the perforations into a set of type positions and, hence, to characters. After the first field of perforations is sensed, translated, and printed on the envelope, letter head, or the like, the translating mechanism is restored and the control card is advanced so that the mid field of perforations on the card is in position to be sensed and translated, the platen is spaced, and a second line is printed. The lowermost field is likewise sensed, translated, and printed. When the last line is printed the control card is ejected into a receiving magazine, and the addressed envelope, letter head, or the like, is also ejected into a receiving receptacle. The above described series of operations is automatically repeated for each fresh card; and each fresh envelope, or the like, is positioned for receiving imprints corresponding to the perforations in the card.

The controlling cards are the familiar standard tabulating machine cards used in connection with the well known Powers and Hollerith systems. The arrangement of the perforations is different, for three systems of perforations may be used on each card, namely:—

1. The usual standard 45 column system
2. The standard upper and lower 90 column system, and
3. The new upper, mid and lower 135 column system

Either, or both, of the first or second systems may be used for codifying valuable information such as, for example, age, nationality, occupation, date on which fees are due, financial rating, etc.

For address work it has been found that twenty eight of the usual forty five columns on the standard card are sufficient. The upper 135 column field is most conveniently used for the city and state part of an address; the mid 135 column field is used for the street part of an address, and the lower 135 column field for the name. A standard card, therefore, has seventeen columns for additional information, which can be increased in effect to thirty-four columns (if desired) by the use of the upper and lower 90 column system.

In addition to the advantages of the previously described system for controlling an addressing machine, a considerable saving in cost of operation is effected since the cost of a standard tabulating machine card is only a small fraction of the cost of the plates or stencils commonly used in connection with the present type of addressing machine. It has been found in practice that the standard tabulating machine card can be used to control upwards of one thousand operations of perforated card controlled machines. It, therefore, follows, that the standard tabulating machine card is as durable an article for controlling machines, as are the more bulky and expensive addressing machine stencils. A further advantage in the use of standard tabulating machine cards is that the address cards may be sorted according to the code perforations in the seventeen (or thirty-four as the case may be) columns used for recording codified information. For example, in addressing magazine wrappers it is desirable to eliminate all addressee's cards whose subscription terminates with a particular addressing operation. Such elimination can be effected by a single run through the usual type of sorting machine after the wrappers have been addressed.

Another advantage in the use of my invention is the ease with which new cards can be duplicated where most of the information is identical with that on the old card. A means and method for effecting such copying is fully shown, described, and claimed in my co-pending application Serial No. 616,926 filed June 13, 1932, now Patent No. 2,004,208.

In the drawings:

Figure 1 is a diagrammatic, isometric view of the platen, its operating and aligning means.

Figure 2 is a sectional view through approximately the center of the machine.

Figure 3 is a view of the code translating mechanism.

Figure 4 is a diagram of the code and the interpretation thereof.

Figure 5 is a view in section through the machine at approximately a vertical plane passing through the main shaft.

Figure 6 is a view in side elevation of the machine.

Figure 7 is a view in side elevation opposite to that of Figure 6.

Figure 8 is a view in horizontal section through the machine in approximately the plane of the sensing chamber.

Figure 9 is a view in horizontal section of the machine slightly below that of Figure 8.

Figure 10 is a view of a typical tabulating machine card arranged for use in my machine.

Figure 11 is a diagram of the sensing chamber and sensing pin box, taken along the line 11—11 of Figure 5.

Figure 12 is a diagram of the sensing chamber and differential card stop associated therewith.

Figure 13 is a fragmentary cross sectional view along the line 13—13 of Figure 3.

Framework

All the operating parts of the machine are supported by a suitable type of framework, which may be of any desired form. In the drawings, a frame member 6 is shown as a single piece for supporting the major part of the card handling and sensing mechanism. It is to be understood that member 6 may be made of a plurality of pieces or parts to facilitate assembly and manufacture. A secondary frame 5 is shown which fits near the middle of the top of the box frame 6. This box or frame contains the major portion of the mechanism associated with the type carriers and printing hammers. A card feeding or stock magazine 7 is suitably attached forward of the frame 5, and a discharge receptacle 8 is located in a convenient position to receive the perforated cards after they have controlled the operation of the machine. A feeding magazine 43 and the storage receptacle 46 are conventionally shown for supplying blank envelopes, letter heads, magazine wrappers, etc., to the printing mechanism, and receiving them after a series of imprints.

Main operating mechanism

The machine is driven by a suitable prime mover such as an electric motor and its rotating armature shaft, both of which are designated by reference character 10. The armature shaft carries a worm which is in continuous mesh with a worm wheel fixed to the main shaft 11, and the main shaft is, in turn, journaled in the frame 6 as is best shown in Figure 5. Fixed to the main shaft is a pair of box cams 12 for reciprocating a vertically guided sensing box 13 with its complement of pins for sensing either the top, mid, or low 135 column fields of the address card. Fixed near the ends of the main shaft is a pair of cams 14 (Figures 5, 6, 7, 8, and 9) for oscillating a pair of arms 15 against the tension of powerful springs. Each of the arms 15 is connected by a link to a corresponding arm fixed to the lower of a pair of shafts 16. The pair of shafts 16 (Figures 2 and 3) are connected by rockers so as always to move the auxiliary pin box 17 parallel to itself.

Fixed at the extreme end of the main shaft 11 is a pair of cams 18 (Figs. 5, 6, 7, 8, and 9). Each of the cams 18 oscillates an arm 19 against the tension of a strong spring. Each arm 19 is connected by a comparatively long link to a universal bar 20 for controlling the positioning and restoring of the series of type carriers 38. The universal bar 20 is guided by suitable slots in the frame 5, said slots being of sufficient width to avoid binding during the oscillation of the arms 19.

Fixed to one end of the main shaft 11 is a small spur gear for driving a larger spur gear fixed to an auxiliary main shaft 21 (Figs. 6 and 9). The construction of the arrangement is such that main shaft 11 makes three turns for each revolution of the auxiliary main shaft 21. The auxiliary main shaft 21 (see Fig. 2) has fixed thereto an eccentric, which through a suitable link and crank mechanism, reciprocates the picker 22 once for every three rotations of the main shaft 11. Also fixed to the auxiliary main shaft 21 (Fig. 12) is a cam 23 having four levels for oscillating a rocker frame which is connected to the differential card stops 24. The arrangement is such that when cam 23 presents its lowest level to the rocking frame, the card in the sensing chamber 35 is positioned for having its upper 135 column field sensed, and when the cam presents its mid level the mid field is in position to be sensed, and finally when the highest level is presented the low field is in position to be sensed. Said cam 23 is provided with a fourth and final short high level for withdrawing the "highest" level of the differential card stop 24 from the path of the card to permit the latter to be ejected by the feed rolls into the storage magazine 8. The auxiliary main shaft 21 has attached thereto a three point trip cam 25 (Fig. 7) for oscillating a lever, to which is pivoted the platen feeding rack 26, against the action of a stout spring. The rack 26 (Fig. 1) is in continuous mesh with a pinion loosely mounted on the shaft of the platen 27. The said pinion is fixedly connected by a sleeve to a feed pawl carrying plate for positioning the latter so that the strong spring acting on the rack 26 will quickly space or feed the platen 27 when the trip of cam 25 passes the follower of the spring pressed lever. In this simple manner a quick line spacing feed is given to the platen 27. One of the tripping points of the cam 25 is very high, so as to give an increased extent of rotation to the platen 27 after the printing of the last line. A special cam 25 is provided for each type of envelope, letter head, bill head, and the like, to provide for the differing spacings and locations of the address thereon. A suitable detent roll and wheel, as shown in Fig. 1, is used to hold the platen 27 frictionally in adjusted position after a rotation thereof by rack 26.

Attached to the shaft of the platen 27 is a sprocket wheel which drives a form or envelope picker 44 (Fig. 2) by a chain and a second sprocket wheel. The form picker consists of a pair of quadrants with corrugated rubber faces for feeding the lowermost form or envelope in the magazine 43 between the platen 27 and its paper guide 45. A suitable pair of pressure rolls is provided for holding the form or envelope against the platen 27 as is well known in the paper feeding art.

Loosely pivoted on the auxiliary main shaft 21 (Fig. 6) is a spring urged lever 28 which is connected by a long link to a hammer restoring frame 31. Lever 28 is oscillated once during each rotation of the main shaft 11 by a roller journaled on the pin 30 between one set of the pair of cams 14 and 18.

Also attached to the main shaft 11 is a large gear which drives a pair of dual idlers for positively driving the lower feed rolls 32, as is best shown in Figure 7. All the upper feed rolls are driven frictionally through the card, except the initial pair which is geared together on the opposite side of the machine as is best shown in Figure 6. All the upper feed rolls 32 are resiliently held in contact with the positively driven lower feed rolls by suitably located springs, as is well known in the card feeding art.

Codes

The code of the 45 column system of perforations is well known. It consists merely of a single perforation which by its position in differing columnar levels gives a value for each digit. The 90 column numerical code is also well known, and has been described in a number of applicant's applications, as, for example, Serial No. 547,822, dated June 30, 1931 or in my Patent No. 1,780,621. It, therefore, remains to describe the code used in the high, mid, and low 135 column fields. This is a fifth order code or five unit code, i. e., a maximum of five holes may be punched in a single column of each field. Each combination of perforations may be given any desired arbitrary interpretation, one of which is shown in Figure 4. For example, unity, or 1, is represented by shifting one of the combination bars 36 as is indicated by the relative location of the short arrows and circles near the bottom of said figure. The character 3 is represented by a single perforation for shifting the "2" combination bar; the characters 5, or S, are similarly represented by a single perforation 5, as is noted by the required shifting of the combination bar "3"; similarly for the remaining odd numbers. The even digits are represented by two perforations, one of which is always the "5" combination bar. Inspection of Fig. 4 reveals that the consecutive order of the digits includes the corresponding consecutive nine steps at the bottom of the type carriers, or what is the same thing the first nine characters on the type carriers are the nine digits arranged in a consecutive order. It is thus seen that the numerical part of the code is identical with that shown and described in my co-pending application Serial No. 547,822 above cited. An example of this code is found in columns 39 to 45 of the card in Fig. 10. Inspection of Figure 4 will reveal the indicia associated with each combination of perforations, for example, the letter Q is represented by five perforations.

The mechanical translation of combination perforations is in reality a product of a series of substitution groups as has been set forth at length in my cited application. The substitution group method of explanation applies peculiarly well where the same mechanism is adapted to interpret differing systems of combinations of perforations as set forth in the cited application. The same principles are applicable herein, thus the pins of the sensing box 13 which find perforations in the card generate a particular substitution or substitution group which is represented by the permutation shifting of the combination bars 36. A second series of sensing pins 37 in the sensing box 17 generate a new substitution (which is merely the inverse, or reciprocal of the code used on the card, from that determined by the combination bars 36, and finally the slides 38 generate a third substitution from the position of the pins 37. The substitutions in the present case are extremely simple and can be easily visualized from Figure 3 alone, inasmuch as the substitution generated by the pins 37 is merely a positional or isomorphic form of the identical substitution. The combination slides 36 are laid in a pack, and each slide has its plurality of reciprocal perforations therein corresponding to the small circles shown in Figure 4. When the combinational slides are lifted by the sensing pins which have found perforations in the card, some one, and only one, arrangement of the holes in the combination slides of Figure 4 will permit a sensing pin 37 to extend through all of the combination slides to limit the upward extent of movement of the type carriers 38 under the tensions of their springs, and that particular one is the inverse or reciprocal of the code sensed.

Just after the pack of combinational slides 36 have been elevated by the sensing pins of box 13, cams 14 acting through levers 15 rock the connected shafts 16 to move the auxiliary sensing pin box 17 to cause the sensing pins 37 to search for a passage through the pack of combinational slides 36. Just after the pins 37, one for each type carrier 38, find a path through the pack of slides 36, cams 18 permit the universal bar 20 to rise and each type carrier 38 will rise under the action of its individual spring until it is arrested by that pin 37 which has found its way through the entire pack. A type corresponding to the particular combination of perforations is now positioned at the printing line.

When universal bar 20 has reached its extreme upward position it rocks a bell crank (see Figure 7) which is connected by a link to a bail frame 41. The bail frame 41 releases all the latches of the printing hammers 40, which then strike the positioned type to print a line through the ink ribbon 47 on the record material against the platen 27. Shortly after the hammers 40 are released, pin 30 (Figure 6) contacts with lever 28 which in turn rocks the hammer restoring bail frame 31. After the printing hammers 40 are well on their way towards latched or cocked position, the bar 20 begins its descent towards its lowermost or home position. During this time the springs attached to the arms 15 withdraw all the sensing pins 37 from the combination slides 36 and also during this time the sensing box 13 is lowered so that the combination slides 36 which were shifted are free to descend. In order to avoid any tendency of sticking a supplementally weighted bail 39 (Figs. 2, 5, 6, and 7) aids in the restoration of said slides. The mechanical arrangement of the slides 36 is shown in Figure 13, where it is seen that each pack of slides is guided by a suitably located grid comb, which also guides the type carriers 38. Applicant does not desire to be limited to the particular form shown, as such is merely illustrative.

While there are above described but a limited number of embodiments of the invention, it is possible to produce still other embodiments without departure from the inventive concept above disclosed, and it is, therefore, desired that only such limitations shall be imposed on the appended claims as are stated therein, or required by the prior art.

What I claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, the combination of record feeding mechanism, a record having plural fields thereon, a sensing mechanism for reading said record and automatic means for

causing the feeding mechanism to present each field of the record to the sensing mechanism comprising a stepped stop member and a cam for the actuation thereof, adapted to cooperate with said record feeding mechanism to convey said record to and against said stepped stops in succession at successive stages in the operation of the machine.

2. In a machine of the class described, the combination of a record feeding mechanism, a record sensing mechanism, a record arresting mechanism including a pair of differentially adjustable stop plates, and means including a cam with plural levels for conjointly controlling the feeding mechanism and arresting mechanism to locate a record field to be read by said sensing mechanism.

3. In a machine of the class described, the combination of record feeding mechanism comprising continuously rotating feed rolls, a record having plural fields thereon, a sensing mechanism for reading said record and automatic means including a cam with plural levels for causing the feeding mechanism to present each field of the plural fields of the record to the sensing mechanism.

4. In a machine of the class described, the combination of five sensing pins, five perforated slides movable thereby in response to code indications in a perforated card, a second set of thirty-two sensing pins cooperating with the perforations in said slides and a movable type carrier adapted to be set by one of said second sensing pins for the positioning of a type character in printable position.

5. In a machine of the class described, a sequence of substitution conveying members comprising groups of five sensing pins, a group of five perforated slides actuable thereby, adapted to translate the substitution indications of said sensing pins from a multi-unit code to a single unit code, a group of sensing pins adapted to be controlled by said slides, and a plurality of type carrying slides adapted to be controlled by said second set of sensing pins, and to translate said single unit code into printed insignia by the positioning of a type face member in printing position, and a printing hammer, ink ribbon and paper carrying roll to print said type character.

6. In a machine of the class described, a record card having a plurality of lines of code insignia, a movable stop member cooperating with said card adapted to position said card with the successive lines successively under a single sensing point, a single sensing mechanism adapted to read said successive lines of code, means for translating said code to a single unit code, and cooperating means for positioning a type character according to the indications of said code.

7. In a machine of the class described, a record card having a plurality of lines of code insignia, a movable stop member cooperating with said card adapted to position said card with the successive lines successively under a sensing point, a sensing mechanism adapted to read said successive lines of code, means for translating said code to a single unit code, cooperating means for positioning a type character according to the indications of said code, means for positioning a paper under said positioning point, and means for moving successive lines upon said paper past said printing point in synchronism with the movements of said card as controlled by said stop.

8. In a machine of the class described, a record card having a plurality of lines of code insignia, a movable stop member cooperating with said card adapted to position said card with the successive lines successively under a sensing point, a sensing mechanism adapted to read said successive lines of code, means for translating said code to a single unit code, cooperating means for positioning a type character according to the indications of said code, means for positioning a paper under said positioning point, and means for moving successive lines upon said paper past said printing point in synchronism with the movements of said card as controlled by said stop, comprising a plural level cam cooperating with said stop member and a second multi-level cam operating synchronously with said first mentioned cam to move said paper.

9. In a machine of the class described, a plurality of synchronously operating cam members, a stepped stop member adapted to cooperate with one of said cams to position a perforated card in successive positions for the successive sensing of data thereon, and a follower, rack, and gear mechanism adapted to cooperate with said other cam to position a paper in successive printing positions for the printing thereon of the data indicated by said record card.

10. In a machine of the class described, a plurality of continuously operating card conveying rolls and a swinging stepped card stop adapted to permit said rolls to position said card against said stop for successive interval periods.

11. In a machine of the class described, the combination of data cards each having a plurality of horizontal rows of vertical sets of code perforations corresponding to a plurality of lines of data record, means for feeding said cards to a sensing mechanism, means for sensing said rows of data successively by the mechanism including continuously operating conveyor rolls, and a series of successively effective card stops adapted to position the said card in relation to the sensing means to bring successive rows of data into cooperation with the sensing means, a code translating means cooperating with said sensing means, printing mechanism controlled by said translating means, and a variable step feeding mechanism adapted to feed printable members from a magazine to a printing platen, to move said printable material and said platen for successive printing operations and to discharge said printable material to a receiving magazine.

12. In a machine of the class described, the combination of a card having three longitudinal lines of code perforations representing a name and address, and number record fields adapted to record data in another code, a sensing mechanism adapted to cooperate with said card, card conveying rolls and a variable position card stop adapted to bring the said successive lines of address record successively into cooperation with said sensing means, a code translating means adapted to cooperate with said sensing member, a printing mechanism adapted to be controlled by said translating mechanism, a printing platen cooperating with said printing mechanism, and mechanism for handling a printable material, comprising a member adapted to feed said material from a magazine to said platen, to advance said printable material, step by step with the movement of said card in cooperation with said sensing means, and to discharge said printable material to a receiving reservoir; for the application of a name, address and numerical data recorded by said card to a printed transcription.

WILLIAM W. LASKER.