U. G. LEE.

PRINTING APPARATUS WITH MULTIPLE LISTER.

APPLICATION FILED MAY 25, 1914.

1,211,459.

Patented Jan. 9, 1917.

5 SHEETS—SHEET 1.

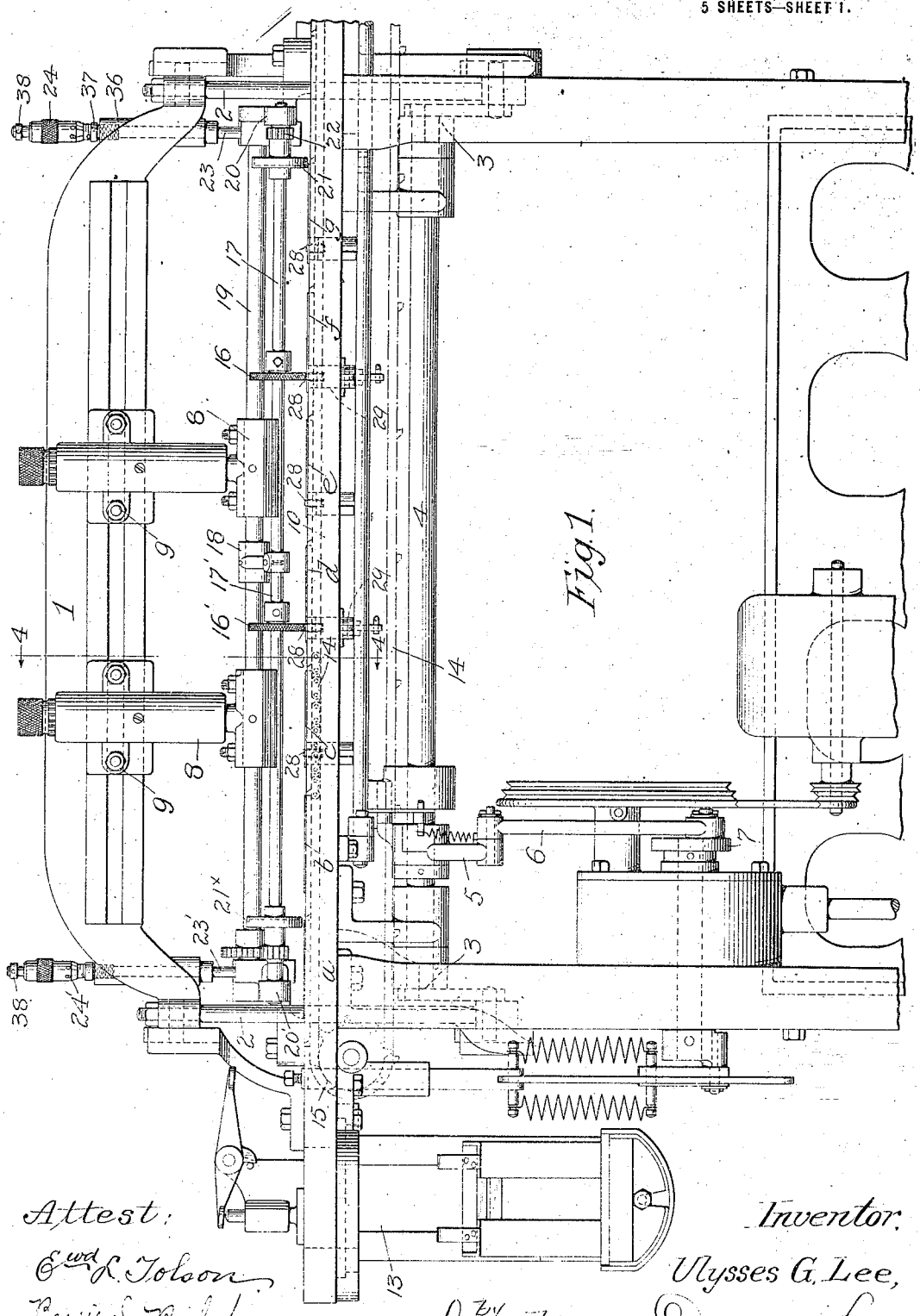


Fig. 1.

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PHOTO-LITHO by SACKETT & WILHELMS CORP N.Y.

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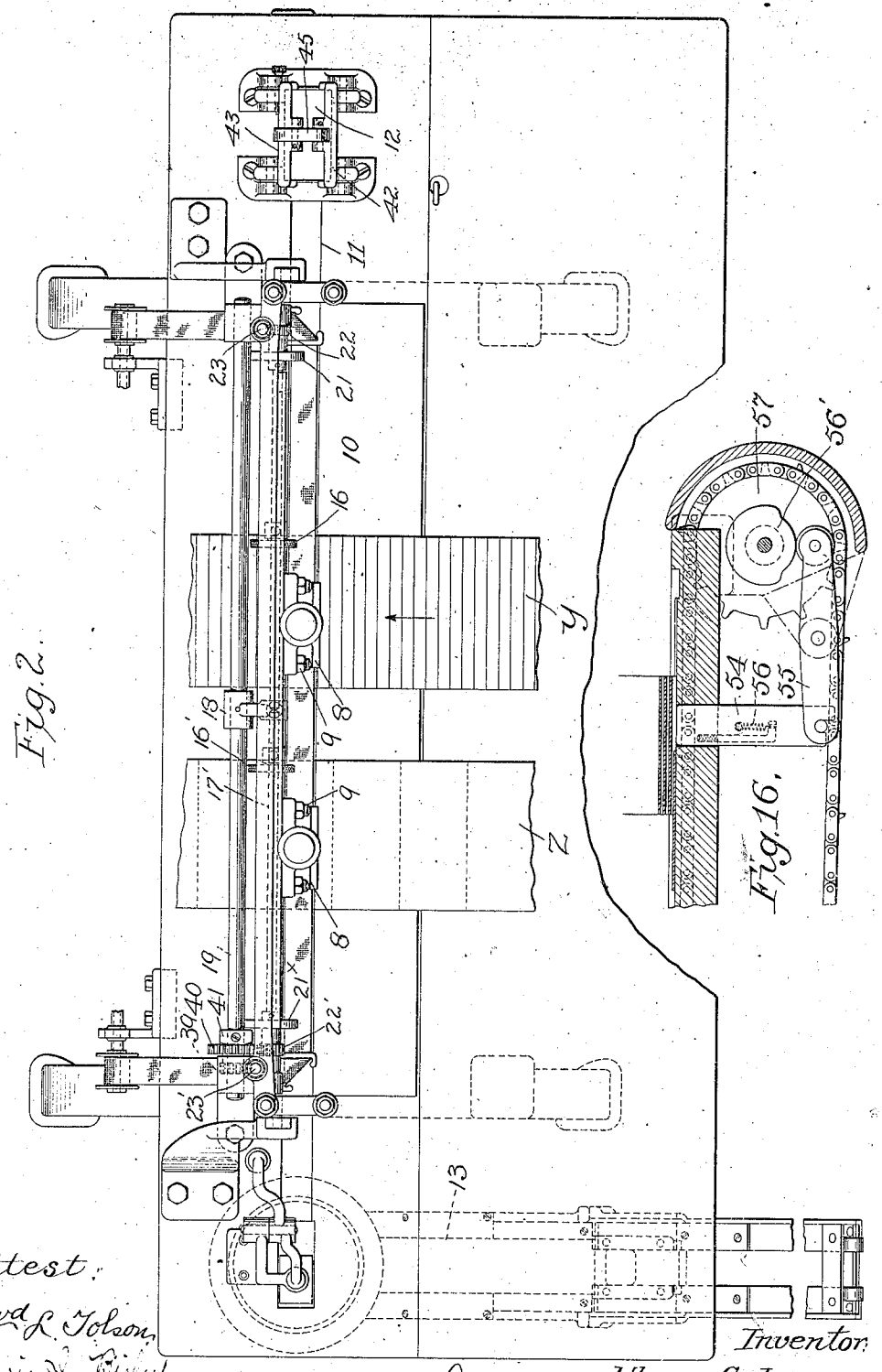


Fig. 2.

Fig. 16.

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Fig. 4.

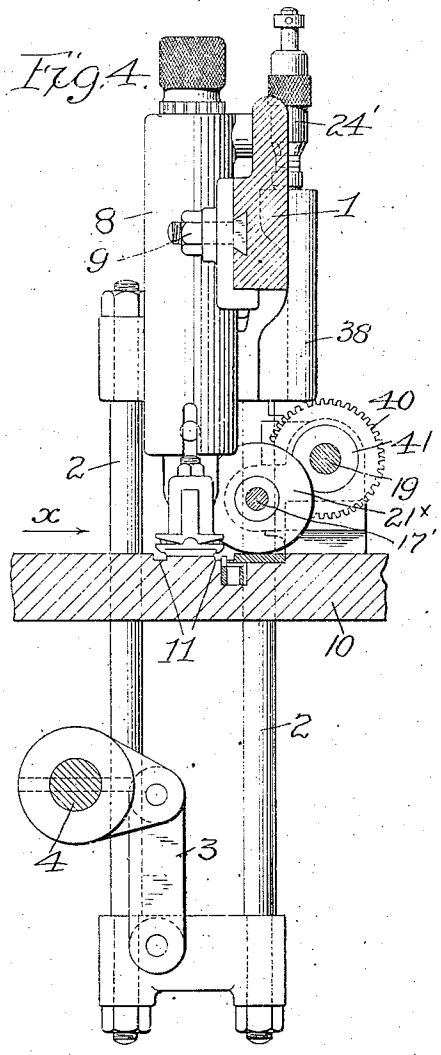


Fig. 3.

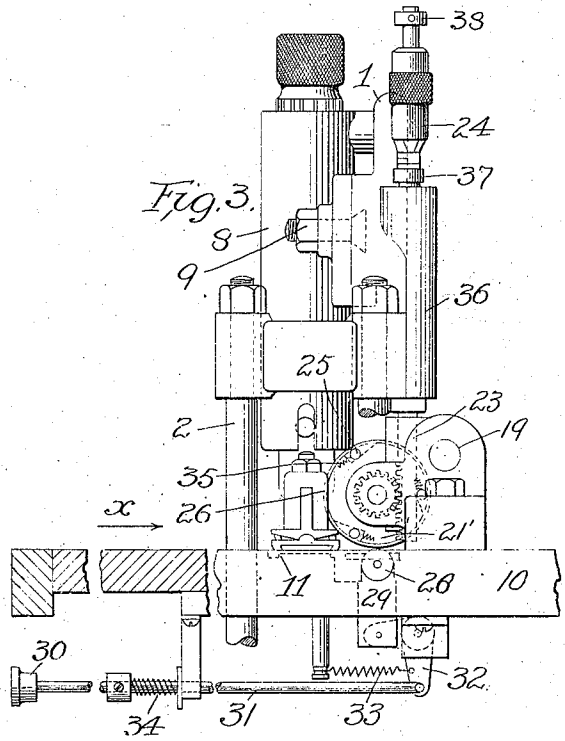


Fig. 5.

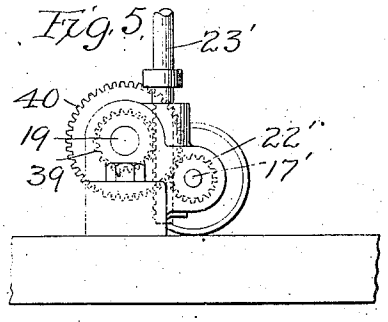


Fig. 7.

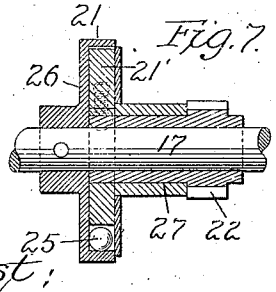
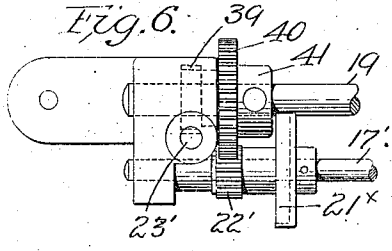


Fig. 6.



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5 SHEETS—SHEET 4.

Fig. 10.

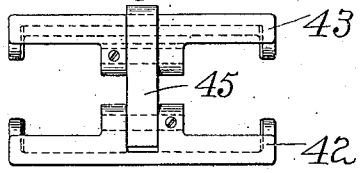


Fig. 9.

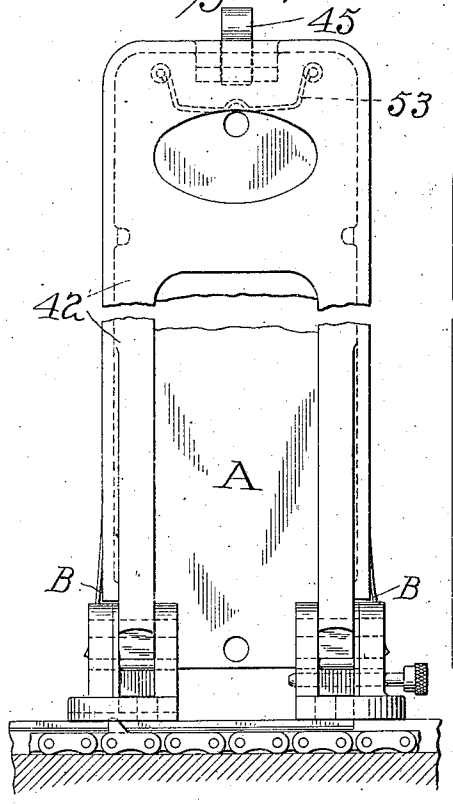


Fig. 12.

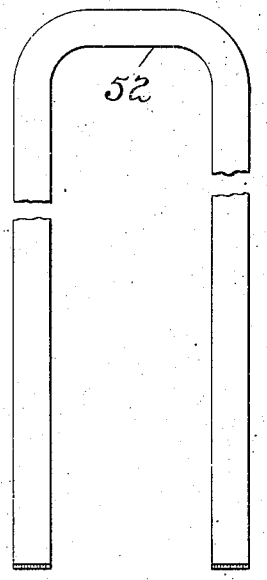


Fig. 8.

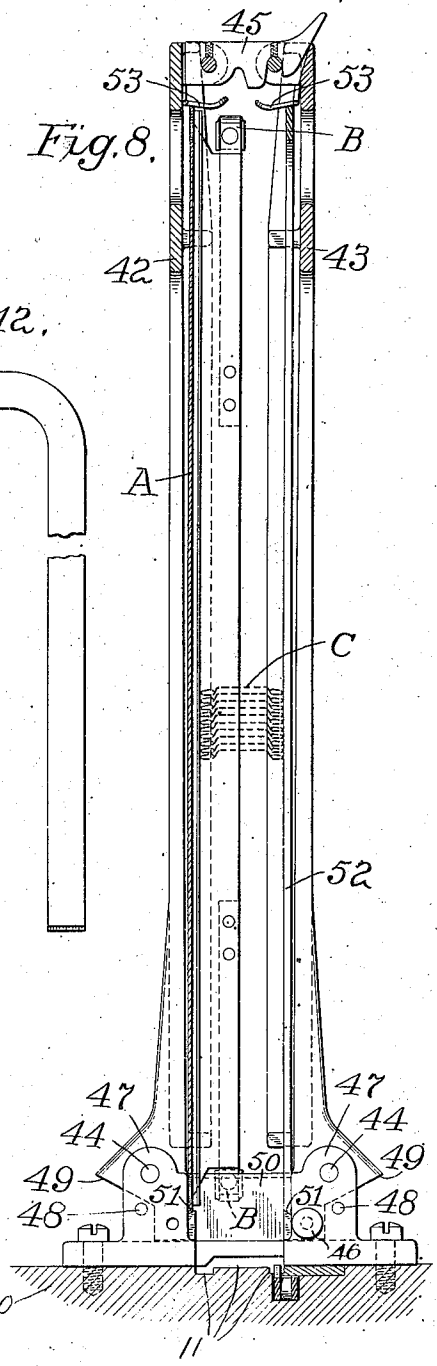
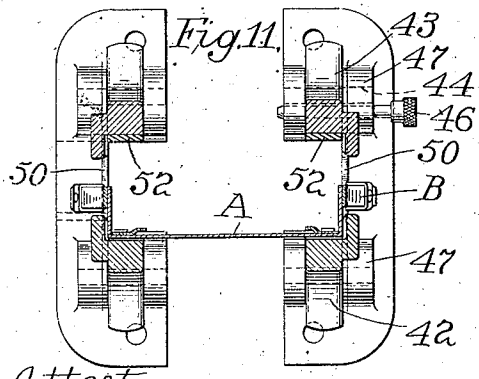


Fig. 11.



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5 SHEETS—SHEET 5.

Fig. 13.

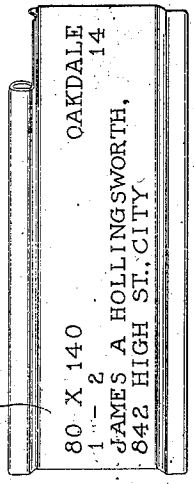


Fig. 14.

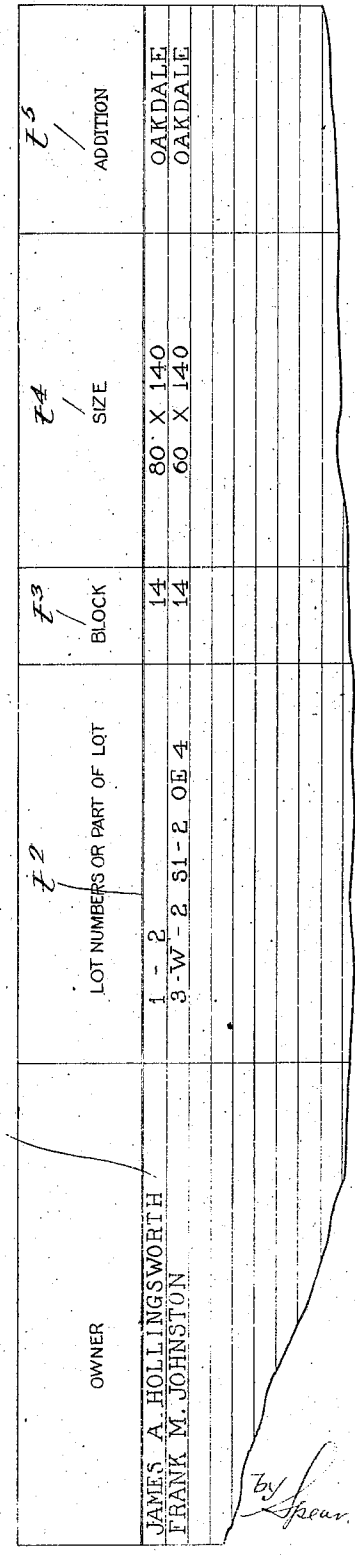
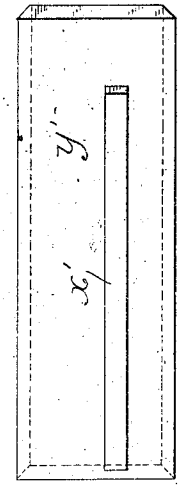


Fig. 15.



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UNITED STATES PATENT OFFICE.

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PRINTING APPARATUS WITH MULTIPLE LISTER.

1,211,459. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed May 25, 1914. Serial No. 840,848.

To all whom it may concern:

Be it known that I, ULYSSES G. LEE, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Printing Apparatus with Multiple Lister, of which the following is a specification.

My invention is designed to provide an apparatus for printing or making records from individual record plates which are fed through the machine one after the other past the impression point, and one object of my invention is to provide for the reception and handling of different forms or sheets to be printed on, and to feed them to different degrees; for instance, in handling a series of checks and a pay-roll, both may be printed from the same plates, the pay-roll form, however, being moved a shorter distance at each feed than the sheets of checks, it being understood that the machine is adapted to print on form sheets of various kinds and requiring the printing to be done in variously located columns and at variously located points.

Other objects of the invention will appear from the following description.

The invention consists in the features of construction and arrangement and combination of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings Figure 1 is a front view of a machine embodying my invention with certain parts, as the hopper omitted; Fig. 2 is a plan view of the part shown in Fig. 1; Fig. 3 is a view looking from the right of Fig. 1; Fig. 4 is a sectional view substantially on the line 4—4 of Fig. 1 with parts omitted; Figs. 5 and 6 are respectively an elevation and a plan view of detail driving connections; Fig. 7 is a sectional detail view. Figs. 8 to 12 are views of a reversible hopper for the record or printing plates; Fig. 13 is a view of one of the record plates looking at the rear or under face; Fig. 14 is a sample of a form which is printed from two of the record plates illustrating how the information contained on a plate is distributed across the form into different columns; Fig. 15 is a face view of one of the impression pads; Fig. 16 is a detail view of a plate lifting arrangement.

In these drawings, 1 indicates an impression bar which is operated vertically by any suitable connections such as the rods 2 connected with crank arms 3 of a shaft 4 to which power is communicated in any suitable way as by an arm 5, the pitman 6 and the face wheel 7. The impression bar carries a series of impression pads or heads 8 which are adjustable to different positions along the impression bar, being held by the bolts 9, and these impression heads or pads may be removed.

10 indicates a table having a guideway 11 for the record plates, which record plates have the printing characters preferably embossed directly thereon. These plates are held in a hopper 12 and are taken therefrom by a feeder and moved lengthwise of the table under the impression pads or heads, and after being printed they are discharged at the left hand end of Figs. 1 and 2 into a stacker chute 13. The plate feeder may be of various kinds, and I do not therefore go into the details of this, but show as an example of any suitable plate feeder that might be used an endless chain 14 passing around a wheel 15 which may be driven in any suitable manner, and any suitable idler wheel may be employed at the other end of the chain shown in Fig. 16. The feeder has dogs thereon for engaging the lowermost plate of the pile in the hopper 12, and feeding it step by step along the table, and I have shown at *a*, *b*, *c*, *d*, *e*, *f* and *g* the record plates at different positions along the table, two of these, *c* and *e*, lying beneath the impression pads. The impression is taken through an inking ribbon which may be directed over the runway in the table by any suitable means.

In order to feed the forms, sheets, or other material to be printed on, I provide feed means which will handle different forms to be fed at different degrees, these several feed means being susceptible of individual adjustment to meet the requirements in the extent of feed according to the particular form being printed. This adjustment of course comes into play also even if only one printing head is employed, this adjustment enabling the operator to adjust the feed to the requirement of the work. The feed mechanism may assume various forms, but in the particular construction shown I employ a feed wheel

16 mounted adjustably on a shaft 17 bearing at one end in a bracket 18 supported on the frame rod 19, the other end of this shaft being journaled in the end frame or bracket as at 20, this shaft being driven through a clutch 21, a pinion 22, a rack bar 23, and an adjustable micrometer device 24 carried at the end of the impression bar 1. The clutch 21 includes a disk 21′ with pockets and clutch rollers 25, and a casing 26 pinned to the shaft 17, as shown in Fig. 7. The disk 21′ is connected by a sleeve 27 with the pinion 22. Now as the rack bar 23 rises with the impression bar, the clutch disk 21′ will be turned counter-clockwise, Fig. 3, and the clutch rollers will drive the casing 26 in the same direction and thus turn the feed roll or wheel 16, and this will feed the sheet or form each time the impression bar rises. This feed wheel 16 coöperates with a pressure roller 28 carried by a post or bearing 29 slidable vertically in the table 10, and this post may be lowered by pulling on a finger piece 30 which, through a rod 31 and bell crank 32, is connected with the post, suitable springs 33 and 34 keeping the parts in position to hold the pressure roll 28 up against the feed wheel 16. As the impression bar goes down the clutch disk 21′ will be turned clockwise, and the clutch rolls 25 will move toward the larger ends of the pockets in the disk without effect on the feed wheel 16. The clutch rolls, as in ordinary practice, are pressed by springs 35. The rack bar 23 passes through a bearing 36 at the end of the impression bar, and through a sleeve 37 which is threaded into this bearing. This sleeve is threaded externally, and the micrometer nut 24 is threaded onto this sleeve and is graduated to match graduations on the sleeve so that it may be accurately adjusted up or down. The bar carrying the rack teeth extends through and above this micrometer nut, and has a collar 38 at its upper end, so that as the impression bar rises the micrometer nut will engage the collar 38 and lift the rack bar, and thus, as described above, the feed wheel 16 will be turned to feed the paper sheet or form from front to rear of the machine in the direction of the roller X, Figs. 3 and 4, to bring a fresh portion of the form under the impression pad. The extent of feed may be varied to a nicety by simply adjusting the micrometer nut up or down on the sleeve 37 so that more or less lost motion will take place before the nut contacts with the collar 38 and thus lifts the rack bar, and indeed the nut may be so adjusted that no feed of the form takes place, all of the upward motion of the nut being lost so far as contacting with the collar 38 is concerned.

It will be noticed from Fig. 1 that there is a feed wheel 16 or 16′ adjacent each of the impression heads or pads 8. A second shaft 17′ is provided to support the second feed wheel 16′, and this shaft is also supported in the bracket 18 and in a bracket 20′ at the left hand end of the machine, Fig. 1. This second feed wheel for the left hand impression pad is operated independently of the feed wheel first described, which is operated through the micrometer arrangement at the right hand end of the impression bar, whereas the second feed wheel 16′ is operated by a similar micrometer arrangement shown generally at 24′ at the left hand end of the impression bar. The rack bar 23′ for the second feed wheel meshes with a gear 39 journaled loosely on the bar 19, and this gear is connected with a gear 40 held by a collar 41 in proper position to mesh with the pinion 22′ on the shaft 17′, and this shaft carries a clutch 21× similar to that above described. Through this train of connections the shaft 17 will be turned counter-clockwise when the impression head rises, and thus the second feed wheel 16′ will be operated to feed its sheet or form in relation to its particular impression head.

It will be seen from the above that each of the impression heads has its own feed mechanism for the sheets or forms, and each feed mechanism may be regulated independently of the other so that the extent of feed taking place at one impression head may be different from that at the other. In this way a payroll sheet Y may be printed at one head requiring but a short spacing between the feeding operations, whereas at the other head a sheet of checks Z may be printed requiring a larger feed.

In order to take off from a record plate less than the entire information contained thereon, various means may be provided, for instance, by having the impression pads of different shape or of different area so that in printing for instance a payroll and a series of checks all of the information may be impressed on the checks but only a part on the payroll. As an example, the payroll may take off only one line of characters from the plate, thus enabling short spacing or feeding movements to take place for the payroll sheet, whereas for the checks all of the information contained on a number of lines of characters may be impressed from the plates, thus requiring a greater feed of the check sheet than of the payroll sheet.

It will be seen that the adjusting devices for varying the feed of the forms or sheets are in the most accessible position for operation and observation, and that the movement of the impression bar is utilized as the means for operating the feeding devices. By pulling on the finger pieces 30 the pressure rolls 28 may be lowered for the introduction and adjustment of the forms or sheets under the feeding wheels.

These pressure rollers are disposed at various points along the table, as shown in Fig. 1. A different number of impression heads may be employed from that shown. These may be adjusted lengthwise of the impression bar, and the feed wheels also may be adjusted to correspond.

In supplying printing plates to the hopper 12 to be fed therefrom along the runway in the table, I employ a drawer or tray such as shown in Letters Patent of the United States of Owens & Lee, #983,081, January 31, 1911, this drawer or tray carrying a series of plates piled therein on the card index system, the tray having spring detents at both ends for holding the plates in upright position. This tray is set in upright position between the sides or standards 42, 43, of the hopper, and the act of placing the tray in position causes its detents at its lower end to be thrust aside by coming in contact with a part of the hopper so that the pile of plates may then fall by gravity so that the lowermost plate of the pile will overlie the runway and be in the range of movement of the dog on the plate feeder. The tray is indicated in Figs. 8, 9 and 11 at A, its spring detents being shown at B. The standards 42 and 43 of the hopper are channeled, as shown in the sectional plan view, Fig. 11, so that the tray may be placed in connection with either of these standards. These standards are pivotally mounted at 44 to swing outwardly away from each other. They are held together by a latch 45. A locking pin 46 passing through the bracket 47 holds the standard 43 in upright position, and by detaching the catch 45 the forward standard 42 can be swung to one side to inclined position to permit the drawer holding the pile or body of record plates to be placed in position without spilling any of these plates, it being understood that the drawer or tray has an open side or top. Pins 48 act as stops against which the tail portions 49 of the standards strike when either of said standards is swung aside. The drawer or tray is shown as having been placed in connection with the forward standard 42, and its lower pair of catches or detents have been spread aside by coming in contact with the edges 50 of the brackets 47, so that the record or printing plates are then free to fall into position for being fed along the table. It is sometimes necessary to feed the record plates through the machine in a position reversed from their normal position, and for this purpose the drawer must be placed against the proper standard. For instance, it may be necessary to place the drawer in connection with the rear standard 43 instead of, as shown, supporting it on the front standard 42, so that by this change the record plates will face a different way in passing through the machine from what they would if the tray were supported on the front standard 42. For this purpose the pin 46 is removed from holding the rear standard 43, and is set to hold the front standard 42 rigidly in position. The rear standard may then be swung rearwardly after the catch 45 is released, and the drawer full of plates may then be set in connection with the rear standard, this standard being held rigidly in inclined position. It will thus be seen that either standard may be set rigidly in position, and the other standard may be swung into inclined position limited by the stops 48, and while in this inclined position the drawer full of plates may be attached thereto. At the bottom of each standard there is a shoulder or notch 51 upon which the lower edge of the drawer rests, as shown in Fig. 8. In order to prevent this shoulder on the free or empty standard from obstructing the free fall of the plates, a frame 52 is provided which fits against the free standard, as shown in Figs. 8 and 11, and provides a flush surface down along which the top edges of the record plates may move. Spring catches 53 will hold either the drawer or the frame 52 in position. When the drawer is held by the rear standard 43, the frame 52 is shifted to be held by the front standard, and present a flush surface here. The dotted lines at C indicate a few of the record plates standing up on edge in the tray, but as the tray is now set up vertically, these plates appear in horizontal position.

Supposing that it is desired to print a form for assessment of real property, instead of, as in the case above mentioned, printing several different forms as a pay roll and a list of checks. This will require that the information contained on the plates be distributed across the form in different columns and that these columns receive information from each of a list of record or printing plates. It will be borne in mind that the form overlies the runway for the plates and receives on its under face the impression from the plate. Say that the items or information on the plate Y, Fig. 13, which is to be distributed on the form is contained on three lines such, for instance, as James A. Hollingsworth on one line 1—2 and 14 on another line, and the dimensions 80x140 and the name of the subdivision or addition "Oakdale" on another line, and there are five columns on the form.

The plate when fed from the hopper under the first impression pad or portion of the impression member, supposing there are three such impression pads or portions instead of two as shown and that these have been adjusted along the impression bar, to occupy the proper positions corresponding to the columns ruled on the form, an im-

pression will be made from the line of characters, "James A. Hollingsworth" at t on the first line of the first column on the form, and for this purpose the impression pad shown in Fig. 15 and which is preferably made of rubber will have a high part X′ to make an impression from the line of characters mentioned, and a depression Y′ to avoid printing from the other two lines. The impression member will rise after making this first impression, and the record plate will be moved to its next position under the second impression pad. This pad will have its face adapted to print from only the line containing the item information "1—2 14," and as the form has been fed forward about an eighth of an inch, *i. e.*, the distance between the line "James A. Hollingsworth" and the line 1—2 14, the impression taken from this line 1—2 14 will be on the same line of the form as the impression "James A. Hollingsworth". This second impression, taken from this second line 1—2 14, will, however, be distributed in the second and third columns t^2, t^3 of the form, as shown in Fig. 14. After this impression is made and as the impression member rises, the record plate is fed to the left in Fig. 1 another step and gets under a third impression pad, and the form sheet is fed again one step and thus when the impression is made from the line "80x140 Oakdale" it will be on the first line of the form, and in line across the form with the two impressions already referred to, and this information derived from this third impression will be distributed in the fourth and fifth columns t^4, t^5 of the form.

As will be understood, the respective impression surfaces of the described pads are differentially disposed, or positioned out of registration with each other, or disposed in different vertical planes intersecting or extending parallel to the path of the feed of the plates.

Reverting back to the first impressions from the plate shown in Fig. 13 and considering the impressions made from a second plate in relation to those made from the first plate above mentioned, it will be understood that the second plate follows the first one through the machine and impressions are made therefrom while some of the impressions are being made from the first plate. For instance, after the first impression "James A. Hollingsworth" is made from the first plate and this plate is fed leftward to its next position and the form sheet is advanced to bring the second line thereon to the point that the first line just occupied, the second plate has been fed to position under the first impression pad or portion, and then when the impression head comes down the impression from this second plate is made on this second line in the first column at the same time that the second impression is made from the second line 1—2 14 of the first plate on the first line in columns 2 and 3, and I have shown this impression "Frank M. Johnston" in Fig. 14. The information on this second plate is distributed along the second line of the form in the proper columns by the proper feeding of the plate and the form in a manner above described, impressions being taken from two or more plates at the same time and this information being distributed in the proper columns and on the proper lines.

If it is desired to print on public service bills like gas or electric light accounts having a main portion and a stub or coupon, the information on a plate may be printed at the required points by properly disposing the plates on the feeder. That is to say, the feeder may be arranged to take a plate from the hopper at each feeding action, or the feeder may be made to miss taking plates so that one or more of the dogs will be left empty and therefore, by properly adjusting the printing pads in relation to each other, a plurality of impressions may be made from the same plate at different points without superimposing one impression on another. This lifter may assume various forms, but in the particular form shown it may consist of a lifting bar 54 operated by a lever 55 and spring 56, the lever being operated by a cam 56′ on the shaft of the idler wheel 57 about which the feed chain passes. This lifter will at certain times raise the pile of plates in the hopper and prevent the feed dog from engaging the lowermost plate and feeding it forward. When this public service bill is being printed, it may remain at rest until it receives all of the impressions or it may be fed forward to suit the requirements relating to the positions the impressions are to occupy. For instance, if the impression has been made on the coupon and it is desired to make the impression on the main body of the bill not in line across the page with the first impression, but more toward the bottom of the bill, the said bill would be fed a step toward the rear of the machine after the impression on the coupon has been made and then the impression would be made thereon.

I claim as my invention:

1. In combination a plurality of record plates, means for feeding them *seriatim* to a plurality of impression points, means for taking off from the plates impressions of less than all the characters on the plates, and individual feeds for the forms to be printed one for each impression point, substantially as described.

2. In combination a plurality of record plates, means for feeding them *seriatim* to a plurality of impression points, means for taking off from the plates impressions of

less than all the characters on the plates, and individual feeds for the forms to be printed, said feeds being individually adjustable to vary the length of feed at one impression point in respect to that at another impression point, substantially as described.

3. In combination a plurality of record plates, means for feeding them *seriatim* and in line to a plurality of printing points, means for taking off from each plate at one point impressions from less of the characters than the entire number thereon and for taking off from each plate at another printing point impressions from a greater number of characters than at the first mentioned point, said means extending over said plurality of printing points to make impressions simultaneously from a plurality of said plates, and individual feeds for forms to be printed, substantially as described.

4. A machine for printing from individual record plates and in combination, a table, a reciprocating impression member above the table having a plurality of impression portions, means for feeding the record plates step by step along the table past the impression member, and individual feeds for the forms to be printed for feeding them in relation to their respective portions of the reciprocating impression member, said individual feeds being arranged above the table and having connections above the table leading to and deriving their motion from the reciprocating impression member, said table directing the forms to the feeds, substantially as described.

5. A machine for printing from individual record plates and in combination, a table, an impression member having a plurality of impression portions operating above and to and from the table, means for feeding the record plates step by step past the impression member, and individual feeds for the forms to be printed for feeding them in relation to their respective portions of the impression member, said feeds including feed wheels located adjacent their respective portions of the impression members and above the table, said table directing the forms to the feeds, substantially as described.

6. A machine for printing from individual record plates and in combination, an impression member having a plurality of impression portions, means for feeding the record plates step by step past the impression member, and individual feeds for the forms to be printed for feeding them in relation to their respective portions of the impression member, the portions of said impression member being adjustable toward and from each other, and the individual feeds being adjustable to correspond, substantially as described.

7. In combination in a printing apparatus, a table, individual record plates carrying characters from which the impressions are made, an impression member having portions to make impressions at different points along the table from said plates, a plurality of form feeding devices, for feeding forms to the different portions of the impression member, and an adjustable connection from each of said feeding devices to the impression member for effecting variations in the feeds individually, substantially as described.

8. In combination a table with means for feeding printing plates along the same, impression means, a plurality of feed wheels for the forms to be printed arranged at the upper surface of the table, a shaft for each of the feed wheels, extending over and along the table, and independently adjustable connections one for each shaft for turning the same, substantially as described.

9. In combination a table with means for feeding printing plates along the same, impression means, a plurality of feed wheels for the forms to be printed arranged at the upper surface of the table, a shaft for each of the feed wheels, extending over and along the table, and independently adjustable connections one for each shaft for turning the same, said connections being operated by the movement of the impression means, substantially as described.

10. In combination a table with means for feeding printing plates along the same, an impression member having a plurality of impression portions, a plurality of feed wheels for the forms to be printed arranged at the upper surface of the table, a shaft for each of the feed wheels, extending over and along the table, and independently adjustable connections, one for each shaft for turning the same, said shafts extending from the ends of the impression member toward each other, the said feed wheels being mounted adjustably thereon and the impression member being adjustable as to the location of its impression portions, substantially as described.

11. In combination a table, means for feeding printing plates along the same, an impression member located above the table extending lengthwise of the feed of the plates and having reciprocating movement toward and from the table, a shaft supported at its ends from and above the table, and extending in a direction parallel to the length of the impression member, a feed wheel secured to the shaft, and a driving connection between one end portion of the impression member and the corresponding end portion of the shaft.

12. In combination a table, means for feeding printing plates along the same, an impression member located above the table

and extending lengthwise of the feed of the plates, and having a reciprocating movement toward and from the table, said impression member including spaced-apart impression surfaces, a feed wheel individual to each impression surface, a sectional shaft each section of which is individual to one of the feed wheels, and independent drive connections between each shaft section and the impression member.

13. In combination a table, means for feeding printing plates along the same, an impression member operating over the table, a feed wheel for the forms to be printed arranged over the table, a shaft extending over and parallel with the surface of the table for supporting said wheel, a connection between said shaft and the impression member to transmit movement therefrom to the shaft and feed wheel, said connection including clutch means for driving the shaft together with the feed wheel in one direction, and a vertically extending rod imparting movement to the clutch from the impression member and means for imparting different degrees of movement through the said rod, substantially as described.

14. In combination a table, means for feeding record plates along said table, a vertically reciprocating impression bar, a feed wheel for the forms to be printed arranged over the table, a shaft carrying said feed wheel, a rod extending vertically at the end of the impression member and operated thereby, and a connection between said rod and the feed wheel shaft, substantially as described.

15. In combination a table having a runway for printing plates, means for feeding the plates along said runway, a feed wheel for the forms to be printed arranged over the table, and a pressure roller arranged below the table to press the paper against the feed wheel and means for retracting said pressure roll to permit the forms to be inserted, substantially as described.

16. In a machine of the class described and in combination, impression means, plate feeding means, a tray for holding a plurality of plates having a displaceable plate rest at one end, and a hopper for holding the tray in an upright position, the hopper including a wall shiftable into a position for receiving the tray and for supporting the same with the plate rest in plate-retaining position, and shiftable into a second position for bringing the plate rest against a part for moving it into releasing position, and for bringing the tray into coaction with another wall of the hopper.

17. In combination with impression mechanism and printing plate feeding means, a tray to hold plates, a hopper for receiving the tray filled with printing plates, said hopper having two standards opposite each other both pivotally mounted so that either may be swung aside in relation to the other for receiving the tray filled with plates, each standard having means for alone supporting a tray thereon, and means for holding the standards together, substantially as described.

18. In combination with impression means and printing plate feeding means, a hopper composed of tiltable standards, means for fixing either standard rigidly in position and permit the other standard to be swung aside for the introduction of the trays, each standard having means for supporting the tray, when tilted, substantially as described.

19. In combination with impression means and printing plate feeding means, a hopper composed of pivotally mounted standards, holding means for fixing either standard rigidly in position and permit the other standard to be swung aside for the introduction of the trays, said holding means comprising a locking pin to engage either standard adjacent its pivot, and a catch for locking the upper ends of the standards together, substantially as described.

20. In combination impression means, printing plate feeding means, a bracket, a pair of standards pivotally mounted on the said bracket and each adapted to receive a tray full of printing plates with detents on said tray for holding the plates in place, means for holding the standards in upright position, the said bracket having means for spreading the detents of the trays when said trays are in position to supply the plates to the feed mechanism, substantially as described.

21. In combination a pair of pivotally mounted standards with means for holding them in upright position, either of said standards being adapted to be swung aside in relation to the other, a shoulder on each standard for supporting a tray full of printing plates, and a shiftable frame to shield the shoulder of the empty standard, substantially as described.

22. In combination impression means, feed means for printing plates, a tray for holding the printing plates, said tray having detent means for retaining the plates thereon, a pivotally mounted hopper having means for supporting the tray, and means for engaging and retracting the detent means when the hopper is swung to an upright position, substantially as described.

23. In a printing apparatus, a series of record plates each having its items contained in a plurality of lines of characters, means for feeding said record plates step by step, impression means extending over a plurality of positions occupied successively by said record plates to make a plurality of impressions from each of said plates, and feeding means for the forms to be printed, said

feeding means moving the forms between impressions and distributing the items contained in the several lines on a record plate in a line across the form and by successive impressions, and the impressions from different plates being made simultaneously and on different lines of the form, substantially as described.

24. In a printing apparatus, a series of record plates each having its items in characters distributed over its surface, impression means, and feeding means for the record plates to feed them step by step to occupy different positions for making impressions, said impression means including a plurality of pads each having an impression surface to coact with only a part of the characters on a plate different from the coacting surface of the other pad or pads, said impression means making impressions simultaneously from a plurality of said record plates, substantially as described.

25. In combination in a printing apparatus, a series of record plates each having its printing characters in different lines, impression means, means for feeding the record plates step by step to occupy different impression points under the impression means, means whereby only a portion of the characters on a plate are impressed at one impression point and another portion at another impression point, feed means for the forms acting to feed said forms into printing position step by step, and between impressions, said plate feeding means acting to present a plurality of plates to their respective impression points for making the impressions therefrom simultaneously, substantially as described.

26. In combination in a printing apparatus, a series of record plates each having its printing characters in different lines, impression means extending over a number of impression points occupied by said plates, with means for taking an impression from only a part of the characters of a plate at one impression point and from another part at another impression point, means for feeding the record plates step by step to occupy different impression points under the impression means, and feed means for the forms to be printed operating to feed the said forms at right angles to the plate feed movement to bring different parts of said forms to the printing point, substantially as described.

27. In combination in a printing apparatus, a series of record plates each having its items contained in lines of characters thereon, an impression member having a plurality of impression pads each adapted to take off only a portion of the items and different from that taken off by the other pads, feeding means for the plates to move them from pad to pad and to present the plates in position for making impressions simultaneously from different plates, and means for feeding the form sheets step by step into printing position under said pads, substantially as described.

28. A printing apparatus comprising individual printing plates having items on different lines and different items on the same line, means for feeding said plates step by step to occupy different columnar positions in relation to the form sheet, impression means extending over a plurality of impression points occupied by said plates with means for taking an impression simultaneously from only a part of the items on the plates, and feed means for the forms acting to feed the same into printing position step by step and between impressions.

29. In combination in printing apparatus, individual address plates, an impression member having a plurality of impression portions, plate feeding means to move the plates step by step to and past the impression member to occupy positions opposite each impression portion, means for automatically spacing the plates on the feeding means at distances apart to permit only one plate being printed from at a time, feed means for the forms to be printed, with means for rendering said feed means inoperative, substantially as described.

30. In combination, printing plates, a reciprocating impression member, means for feeding the printing plates, a form feed roll, a shaft extending horizontally and carrying said roll, a vertically extending rod movable with the impression member, a clutch and gearing between said vertically movable rod and the horizontal shaft, and means for varying the amount of the impression member's movement which shall be transmitted to the clutch and gearing through said vertical rod, substantially as described.

31. In combination, printing plates, a table, means for feeding the plates along the table to and past the printing point, an impression member having movement to and from the plate at the printing point, a form feed roll, a shaft extending horizontally over the table and carrying the said roll, a clutch for operating the shaft, a connection between the clutch and the impression member for operating said clutch from the movement of said impression member, said connection being adjustable to impart more or less of the movement of the impression member to the form feed roll, substantially as described.

32. In combination, record plates each having its characters disposed in different lines, means for feeding the record plates one after the other and in line to occupy different printing positions, means for feeding a form sheet in a direction transverse

to the line of feed of the plate, impression means for taking off from each plate an impression of a portion of its characters at one of its printing positions and an impression of another portion of its characters at another of its printing positions, said form feeding means operating to shift the form sheet between impressions to distribute the impressions from each plate on the same line across the form sheet, substantially as described.

33. In combination record plates each having its characters disposed in different lines, means for feeding the record plates one after the other and in line to occupy different printing positions, means for feeding a form sheet in a direction transverse to the line of feed of the plates, impression means for taking off from each plate an impression of a portion of its characters at one printing position and an impression of another portion of its characters at another printing position, said sheet feeding means operating to shift the form sheet between impressions to distribute the impressions from each plate on the same line across the form sheet, said impression means simultaneously taking off impressions from different lines of a plurality of plates, substantially as described.

34. In combination record plates, each having printing characters thereon in different lines, means for feeding the record plates one after the other and in line to occupy different printing points, means for taking off from the plates impressions of less than all the characters on the plates, and feeding means including a plurality of feeds adjustable to work in unison and to the same degree on the same form sheets or to work at different degrees simultaneously on different forms, substantially as described.

35. In combination a table having a runway, means for feeding a form or forms across the table in a direction transverse to the length of the runway, printing plates with means for moving them one after the other along the runway, an impression member above the table, a plurality of impression pads adjustably mounted on the impression member to be set at different points over the runway, and an inking ribbon extending along the runway over a plurality of the positions to be occupied by the printing plates, the said inking ribbon being turned rearwardly at its ends and spools for moving the inking ribbon, substantially as described.

36. In a machine for selectively printing from a single plate in a plurality of columns and in a continuous operation items individual to the columns and in combination, sheet feeding means, a record plate having the items for the several columns arranged thereon in spaced apart sections, means for feeding the plate in a single path extending in a direction transverse to the direction of feed of the sheet, for bringing it into registration successively with the several columns and means for taking an impression from the plate while in registration with each column, one of the impressions being limited to less than the whole number of items on the plate.

37. In a machine for selectively printing from a single plate in a plurality of columns of a sheet or sheets and in a continuous operation items individual to the columns and in combination, means for supporting the sheet or sheets in position to be printed upon, a record plate having the items for the several columns arranged thereon in spaced apart sections, means for feeding the plate in a single fixed path extending in a direction transverse of the columns of said sheet or sheets supported as aforesaid, for bringing it into registration successively with the several columns, means for taking an impression from the plate while in registration with each column, one of the impressions being limited to less than the whole number of items on the plate, and means for advancing the sheet or sheets in a direction transverse to the path of movement of the printing plate.

38. In an apparatus for selectively printing in a plurality of columns items individual to the columns from a plurality of plates successively fed in a single path extending transversely in relation to the columns and in combination, a plurality of printing plates, each containing a plurality of items each individual to one of a plurality of columns of a receiving form, means for feeding the plates in a single path and for registering the plates successively with a plurality of printing points, means for taking an imprint at each printing point of items different from those of which an impression is taken at the other printing points, said means including a single inking ribbon common to all of the printing points, and means for feeding a sheet or form for bringing the several imprints from each plate into the same transverse space or in transverse alinement.

39. An apparatus for selectively printing in a plurality of columns items individual to the columns from a plurality of plates successively fed in a single path extending transversely in relation to the columns and in combination, a plurality of printing plates each containing a plurality of items, each set of items being individual to one of a plurality of columns of a receiving form, means for feeding the plates in a single path and for registering the plates successively with a plurality of printing points, means

for taking an impression from each plate limited to less than the whole number of items thereon as it is in registration with a printing point, and means for feeding the receiving form after each impression a distance commensurate with the space occupied by the item from which the impression has been made.

40. An apparatus for selectively printing in a plurality of columns items individual to the columns from a plurality of plates successively fed in a single path extending transversely in relation to the columns, and in combination, a plurality of printing plates each containing a plurality of items, each set of items being individual to one of a plurality of columns of a receiving form, means for feeding the plates in a single path and for registering the plates successively with a plurality of printing points, means for taking an impression from each plate limited to less than the whole number of items thereon as it is in registration with each printing point, and means for feeding the receiving form after each impression in a direction transverse to the path of feed of the plates.

41. In a machine for selectively printing in a plurality of columns items individual thereto from a plurality of plates and in combination, a plurality of plates each containing items appropriate to a plurality of columns on a form sheet, the items on each plate being spaced apart, means for feeding the plates successively in a single path to each of a plurality of printing positions, a new plate being brought to the first of the plurality of printing positions as the precedingly fed plate registers with the second printing position, means for simultaneously obtaining an impression from all of the plates located at the printing position aforesaid, the impression taken from each plate at each position being of an item different from that taken at any other position, and means for advancing the form sheet at each impression and in a direction transverse to the feed of the plates a distance commensurate with the space occupied by the item from which the impression has been made.

42. In a machine for selectively printing in a plurality of columns items individual to the columns from a plurality of plates and in combination a plurality of plates each containing the items appropriate to the plurality of columns on a sheet, the item appropriate to the first column being located adjacent one edge of the plate and the items appropriate to the successive columns in successive rows toward the opposite edge of the plate, means for feeding the plates successively to each of a plurality of printing points, means for simultaneously taking an impression from all of the plates located at said points, the impression taken at each point being different from that taken at any other point and means for advancing the form sheet following each impression operation a distance commensurate with the space between successive items on the plate.

43. The combination with a tray having an open longitudinal side and a displaceable plate rest at one end shiftable for freeing said end from obstruction to permit of the feeding of the plates therethrough, and a hopper including parallel walls for extending lengthwise of the tray for supporting the same and holding the plates against displacement through the open side of the tray, one of said walls being tiltable in respect to the other for facilitating the entrance of the tray therebetween, and a surface on said hopper coacting with the plate rest for displacing the same as the wall is returned to its initial position.

44. In combination a plurality of record plates, means for feeding them in a substantially fixed line to a plurality of printing points, means for taking off from each plate at one point impressions from less of the characters than the entire number thereon, and for taking off from each plate at another printing point impressions from a greater number of characters than at the first-mentioned point, said means extending over said plurality of printing points to make impressions simultaneously from a plurality of said plates.

45. In combination a plurality of record plates, means for feeding them in a substantially fixed line to a plurality of printing points, means for taking off from each plate at one point impressions from less of the characters than the entire number thereon, and for taking off from each plate at another printing point impressions from a greater number of characters than at the first-mentioned point, said means being movable toward and from the path of feed of the plates, and including portions for coöperating with said plates, said portion being adjustable in a plane parallel with the length of said path.

46. In a machine for printing from a plurality of individual record plates, and in combination, an impression member having a plurality of impression portions, means for feeding the plates *seriatim* thereto, individual feeds for a plurality of forms for feeding them in the same direction in relation to their respective portions of the impression member, said individual feeds being actuated by the impression member.

47. In a machine for printing from a plurality of individual record plates, and in combination, an impression member having a plurality of impression portions, means for feeding the plates *seriatim* thereto, individual feeds for a plurality of forms for feeding them in the same direction in relation to their respective portions of the im-

pression member, said individual feeds being actuated by the impression member and embodying means for individually varying the amount of feeding movement thereof.

48. In a machine for printing from a plurality of plates having the items to be printed arranged thereon in spaced apart areas, a table, a straight runway for the plates, means for feeding the plates *seriatim* along the runway, and an impression member movable toward and from the table and having a plurality of impression surfaces fixed relatively to each other and differentially disposed to coöperate respectively with the spaced apart areas individually thereto, said surfaces being located at different points lengthwise of and above the runway, substantially as described.

49. A machine for printing from a plurality of plates having the items to be printed arranged thereon in spaced apart areas, a table, an impression member movable toward and from the table, and means for feeding the plates successively along the path extending parallel with the length of the impression member, said impression member having a plurality of impression surfaces which are out of line with each other both laterally and longitudinally of the impression member, substantially as described.

50. In a machine for printing from a plurality of individual record plates and in combination, an impression member having a plurality of spaced-apart impression surfaces individual to different portions of the plates, a plate holder, plate feeding means including a device adapted to engage a plate in the holder upon each operation of the impression member and advance the same toward the adjacent impression surface, and means operating at intervals for preventing the engagement of a plate.

51. In a machine for printing from a plurality of individual record plates and in combination, an impression member having a plurality of spaced-apart impression surfaces individual to different portions of the plates, a plate holder, plate feeding means actuated upon each operation of the impression member and including a plate engaging device for engaging the lowermost plate in the holder and advancing the same, and automatically operating mechanism timed in relation to the movement of the plate engaging means and acting at intervals to prevent the engagement of said lowermost plate by said device.

52. In a machine for printing from a plurality of individual record plates and in combination, an impression member including a plurality of impression plates adjustable lengthwise of the member and having surfaces individual to different portions of the plates, a plate holder, plate feeding means including a device for engaging the lowermost plate in the holder, and means acting at intervals for moving the lowermost plate out of the path of movement of said engaging device.

53. In a machine for printing from a plurality of individual record plates and in combination, an impression member including a plurality of impression plates adjustable lengthwise of the member and having surfaces individual to different portions of the plates, a plate holder, plate feeding means including a device for engaging the lowermost plate in the holder, means acting at intervals for moving the lowermost plate out of the path of movement of said engaging device, said means including a pusher and operating means therefor including a cam movable in synchronism with the plate advancing means.

54. In a machine for printing from a plurality of plates having the items to be printed arranged on said plates in parallel lines, a plate hopper, a straight runway for the plates, means for feeding the plates from the hopper step by step and *seriatim* along the runway in the direction corresponding to the lines of items, impression means having a plurality of impression surfaces distributed over the runway and at different distances respectively from the plate hopper said impression surfaces being fixed relatively to each other and out of line with each other in the direction of the plates' movement and respectively in line with the lines of items individually thereto, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

ULYSSES G. LEE.

Witnesses:
JAMES M. PERKINS,
GEORGE WINHAM.