(No Model.) 2 Sheets—Sheet 1.

A. R. ABBOTT.

TICKET PRINTING APPARATUS.

No. 490,939. Patented Jan. 31, 1893.

Fig. 2.

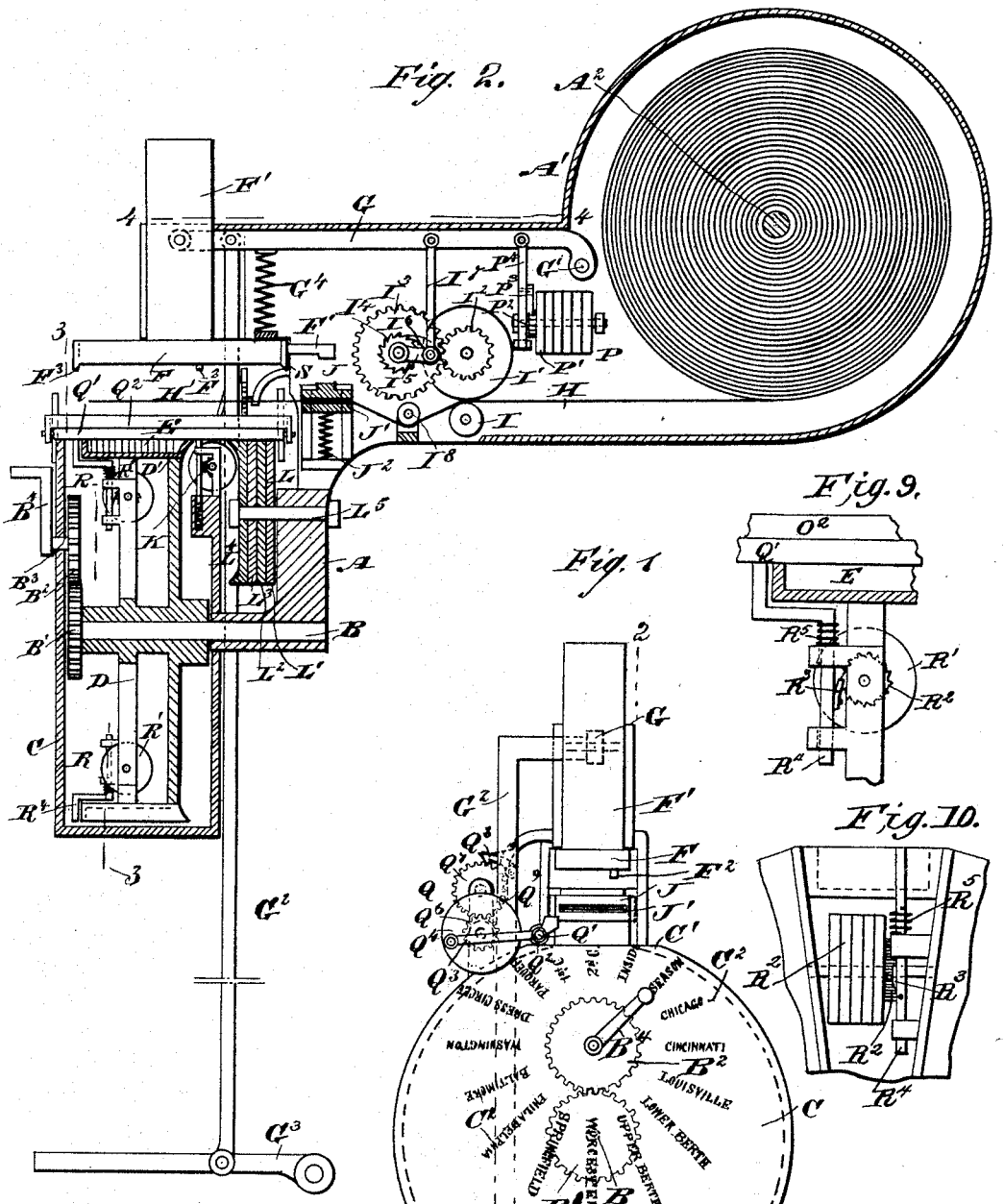

Fig. 1

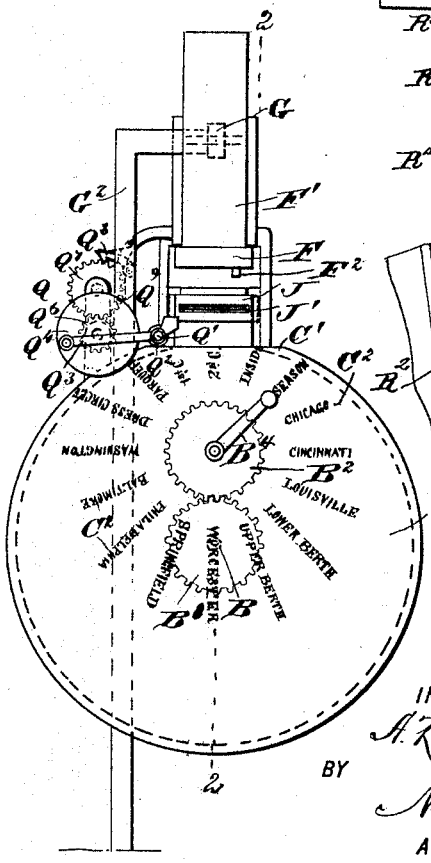

Fig. 9.

Fig. 10.

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C. Bedgewick

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(No Model.) 2 Sheets—Sheet 2.

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TICKET PRINTING APPARATUS.

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Fig. 5

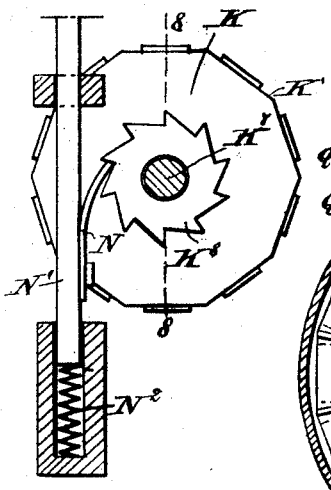


Fig. 3

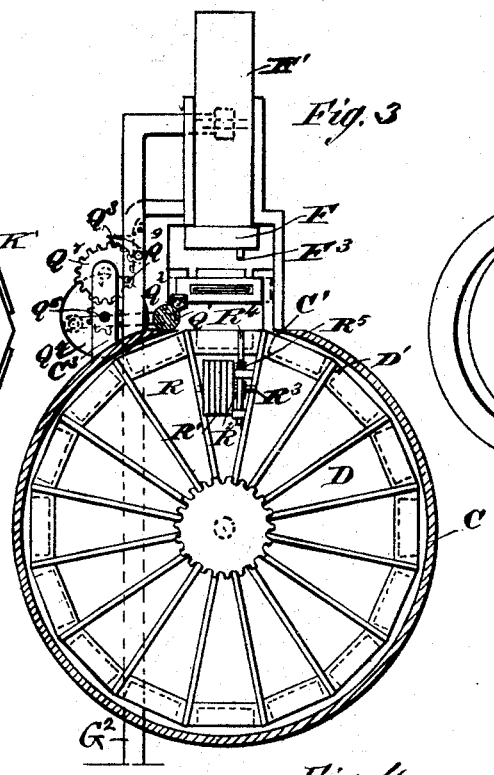


Fig. 6

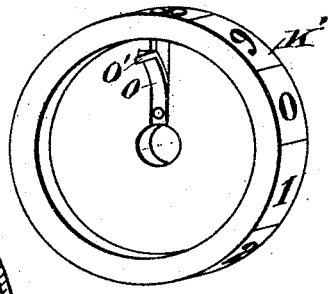


Fig. 7.

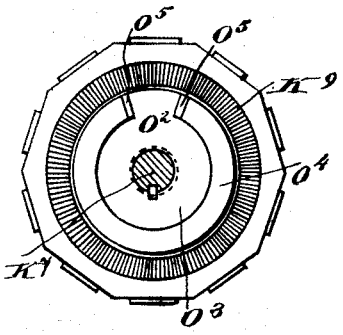


Fig. 4.

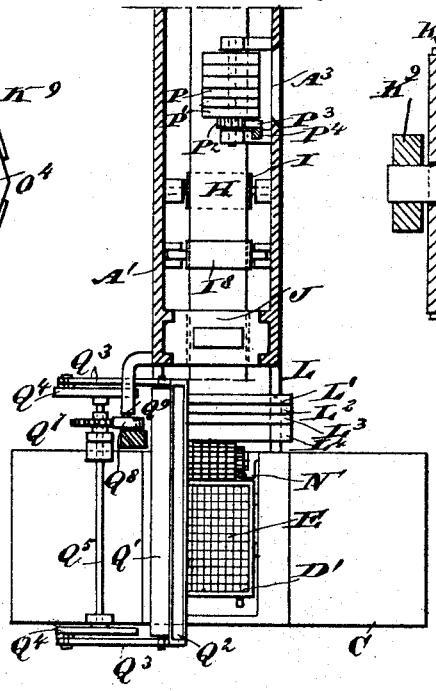
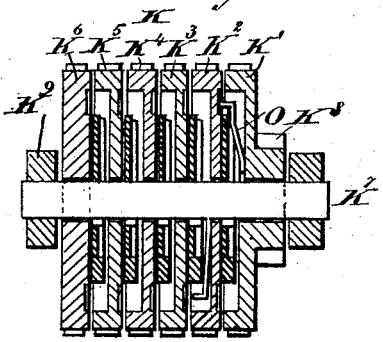


Fig. 8.



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ALBERT R. ABBOTT, OF BOSTON, MASSACHUSETTS.

TICKET-PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 490,939, dated January 31, 1893.

Application filed March 22, 1892. Serial No. 425,919. (No model.)

To all whom it may concern:

Be it known that I, ALBERT R. ABBOTT, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Ticket-Printing Apparatus, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved apparatus for printing all kinds of tickets, numbering them consecutively, and counting a total of all the tickets issued as well as counting a total of each especial kind issued, the apparatus being more especially designed for use on railroads, in steamboat offices, theater ticket offices &c., to enable the operator to at once print and issue a ticket for any point along the line or seat in the theater, &c., and to preserve a complete record of all the tickets thus issued.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement; Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1; Fig. 3 is a sectional front view of the same on the line 3—3 of Fig. 2; Fig. 4 is a sectional plan view of the same on the line 4—4 of Fig. 2; Fig. 5 is an enlarged side elevation of the consecutive numbering mechanism with parts in section; Fig. 6 is a perspective view of one of the wheels of the said numbering mechanism; Fig. 7 is a rear face view of one of the wheels of the consecutive numbering mechanism; and Fig. 8 is a transverse section of the consecutive numbering mechanism on the line 8—8 of Fig. 5. Fig. 9 is an enlarged side elevation of the consecutive bearing mechanism for the type wheel, part being shown in section; and Fig. 10 is a front view of the same.

The improved ticket printing apparatus is provided with a suitably constucted frame A, in the lower part of which is journaled the transversely extending shaft B, having its front projecting end reaching into a casing C, preferably made circular, with an opening C′ at the top, as is plainly shown in Figs. 2, 3 and 4.

On the end of the shaft B, within the casing C, is secured a type wheel D, provided in its rim with recesses or pockets D′, each carrying a set of type E, for printing an especial ticket.

In case the device is used for printing, for instance, railroad tickets, the sets of types E in the type wheel D contain the necessary subject matter for printing tickets for the various stations along the line. If the device is used, for instance, in theaters, the type E contains subject matter for printing tickets for the various seats in the house. If the device is used for other purposes, the sets of types E contain appropriate words and characters according to the especial use for which the tickets are intended.

The wheel D, with its shaft B, is mounted to turn by hand, and for this purpose the extreme front end of the shaft B is provided with a gear wheel B′, in mesh with a second gear wheel B^2, attached to a shaft B^3, journaled in the front plate of the casing C. On the outer end of the shaft B^3 is secured a crank arm B^4, adapted to be taken hold of by the operator to turn the said wheel D to bring the desired set of type E into the top opening C′ of the casing C.

In order to at once indicate that the desired type is in the top opening C′, the front plate of the casing C is marked, as at C^2, to indicate the different sets of types in the wheel D, the crank arm B^4 being the pointer to indicate on the said marks that the corresponding set of type is in the top opening C′. For instance, as shown in Fig. 1, the crank arm B^4 indicates on the word "Season" and the type E of the wheel D standing in the opening C′ is for subject matter to print a season ticket. Thus if the crank arm B^4 is turned to any of the marks C^2, a corresponding set of type E of the wheel D is brought into the opening C′. Directly above this opening C′ and in line with the top set of type E is arranged a platen F, adapted to move up and down and serving to make the proper impression of the type on the paper to be printed, as hereinafter more fully described. This platen F is secured on the lower end of an arm F′, extend-

ing upward and pivotally connected with a lever G, fulcrumed at G′ in a casing A′, projecting rearward from the frame A. The lever G is pivotally connected near the arm F with a link G^2, connected with the treadle G^3, under the control of the operator's foot, so that when the said treadle is pressed the lever G swings downward, and consequently moves the platen F in the same direction to make the impression on the paper. A return movement of the lever G and the parts connected with it is obtained by a spring G^4, pressing on the under side of the said lever and supported on the frame A, see Fig. 2.

The paper H, to be printed is arranged in a roll held on a stud A^2 secured in the casing A′. The paper unwinding from the roll extends horizontally and forward and between two feed rollers I and I′, preferably having serrated peripheries to positively move or feed the paper. The uppermost feed roller I′ is provided, on one of its faces, with a gear wheel I^2, in mesh with a larger gear wheel I^3, journaled in the casing A′ and carrying, on one face, a ratchet wheel I^4, engaged by a pawl I^6, held on an arm I^5, journaled loosely on the shaft of the gear wheel I^3. The arm I^5 is also pivotally connected by a link I^7, with the lever G, so that when the latter is moved downward the pawl I^6 glides over the teeth of the ratchet wheel I^4, while on the return movement of the said lever G, the pawl I^6 turns the ratchet wheel I^4, and consequently the gear wheel I^3 which, by meshing into the gear wheel I^2, imparts a rotary motion to the feed roller I′, so that the paper H is fed forward the proper distance. The paper, after leaving the feed rollers I and I′, passes under a roller I^8, and then extends upward and through a slot J′ in a paper holder J, mounted to slide vertically in suitable guideways in the casing A′. A spring J^2, presses on the under side of the paper holder J to hold the same in a normal, uppermost position, as is plainly shown in Fig. 2. The top of the holder J is adapted to be engaged by an arm F′, projecting from the platen F, at the rear end thereof, so that when the said platen moves downward the holder J is carried with it, thus moving the paper held in the said holder in a like direction.

It will be seen by reference to Fig. 2, that when the holder J is in its normal, uppermost position, part of the paper extends to the front of the said holder, and this part will form the next ticket when the mechanism is actuated, as hereinafter more fully described. It will be seen that this ticket part H′, of the paper extends about midway between the top surface of the type E and the platen F, and when the latter moves downward and actuates the holder J, the latter carries this ticket part H′ down over the type E so that a proper impression is made by the platen F. It will further be seen that when the holder J is in this position and the paper is fed forward by the feed rollers I and I′, then the front end of the paper can readily pass into the empty space between the type E and platen F, so that a proper unobstructed feeding is obtained.

At the rear face of the type wheel D is arranged a consecutive numbering mechanism K, adapted to print consecutive numbers on the ticket part H′ of the paper directly in the rear of the type E. This consecutive numbering device K is supported on the main frame A, and is provided with a series of numbering wheels K′, K^2, K^3, K^4, K^5 and K^6, each formed on its periphery with raised numerals arranged consecutively from "0" to "9." The top numerals of the several wheels are arranged to extend to the same height as does the type E of the uppermost set of type in the type wheel D. The several wheels K′, K^2, K^3, K^4, K^5 and K^6, are mounted to turn loosely on a shaft K^7, mounted to turn in suitable bearings arranged in the main frame A. The numbering wheel K′ is the units wheel, K^2 the tens wheel, K^3 the hundreds wheel, K^4 the thousands wheel, K^5 the tens of thousands, and K^6 the hundreds of thousands. It will be readily understood that the number of wheels may be increased to print millions and higher numerals.

On the outer face of the units wheel K′ is formed or secured a ratchet wheel K^8, engaged by a spring pawl N, attached to a bar N′, mounted to slide vertically in suitable bearings arranged on the main frame A, see Figs. 2 and 5. On the lower end of the bar N′ presses a spring N^2, to hold the said bar in an uppermost position. The upper end of the said bar is in the path of a lug F^2, projecting from the under side of the platen F, so that when the latter moves downward its lug F^2 presses the bar N′ in the same direction, whereby the pawl N glides over the next tooth of the ratchet wheel K^8, and when the platen F moves upward the spring N^2 forces the bar N′ in the same direction, whereby the pawl N moves the ratchet wheel the distance of one tooth, thus shifting the units wheel K′ to the next numeral.

In order to operate the tens from the units wheel, and the hundreds wheel from the tens wheel, and so on with the several wheels, at every revolution of the preceding wheel, the following device is provided;—On the inner face of each of the wheels is secured a radially extending spring arm O, formed at its upper end with a V-shaped tooth O′, adapted to engage a toothed wheel K^9, formed on the opposite face of the next following wheel. The spring arm O is adapted to travel during nine-tenths of the revolution of the wheel, which carries it on a segmental rim O^4 of a wheel O^3, secured on the shaft K^7. The remaining one-tenth part of the said wheel, between the ends of the rim O^4, forms a recess O^2, into which drops the upper end of the spring arm O, so that its tooth O′ can engage teeth on the wheel K^9. Thus, during nine-tenths of the revolution of the units wheel, for instance, the spring arm O is held with its tooth O′ out

of engagement with the teeth of the wheel K^9, so that the tens wheel K^2 remains stationary. As soon as the spring arm O passes over the end of the rim O^4 into the notch O^2 its tooth O' engages the wheel K^9, and during one-tenth of the revolution of the units wheel the tens wheel K^2 is rotated with it, so that the next numeral is brought on the top of the tens wheel. On the further rotation of the units wheel the spring arm O again travels up the slightly inclined end O^5 of the rim O^4, so as to move the tooth O' out of mesh with the wheel K^9. The above described construction and operation are the same for every one of the wheels in the series, so that further description is not deemed necessary. As the top numerals of the several wheels K', K^2, K^3, K^4, K^5 and K^6, stand in line with the top surfaces of the type E in the opening C', a numeral will be printed on the ticket part H' of the paper when the impression is made. On the return movement of the platen F, the consecutive numbering mechanism is actuated as above described, so that the next following numeral is brought on top, and the next ticket printed bears the numeral following that on the preceding ticket. In the rear of this consecutive numbering mechanism K is arranged a dating mechanism L, comprising a number of wheels L', L^2, L^3 and L^4, mounted to turn on a shaft L^5, and shifted by the operator so as to bring the wheels in the proper position for printing the proper date on the ticket. For this purpose the wheel L' is formed on its periphery with type characters indicating the different months in the year, while the wheel L^2 contains, on its periphery, type characters corresponding to the consecutive days in the month, while the wheel L^3 is likewise provided on its periphery with characters indicating the years, and the front wheel L^4 is formed with characters indicating any especial mark desired to be printed on the ticket. As previously mentioned the several wheels L', L^2, L^3 and L^4, are shifted by hand, so as to bring the desired characters on top.

By reference to Fig. 2 it will readily be seen that the dating mechanism L is located in front of the paper holder J and below the rear end of the platen F, so that when the ticket is printed the type E will print the subject matter with the station, seat, or other matter onto the ticket, while the consecutive numbering mechanism K will number the ticket, and the dating mechanism L will print the corresponding date on which the ticket is issued, on the ticket.

In order to count the entire number of tickets issued a counting mechanism P, is provided, similar in construction to the consecutive numbering mechanism K, the said total counting mechanism P being provided with a units, a tens, a hundreds, a thousands wheel, &c., and also with mechanism for shifting the individual wheels as described above in reference to the consecutive numbering mechanism K, and as illustrated in Figs. 5, 6, 7 and 8. The units wheel P' of this total counting mechanism is provided with a ratchet wheel P^2, engaged by a pawl P^3 held on a bar P^4, mounted to slide vertically and pivotally connected at its upper end with the lever G, so that when the latter moves downward the bar P^4 moves in the same direction and the pawl P^3 turns the ratchet wheel P^2 to shift the counting mechanism, as is readily understood. The numerals of the wheels P' indicating the total number of tickets issued appear through a slot A^3, formed in one side of the casing A', as is indicated in Fig. 4.

In order to properly ink the type E in the top opening of the casing C, as well as the top numerals of the consecutive numbering mechanism K and also the type characters of the wheels L', L^2, L^3 and L^4 of the dating mechanism L, an inking mechanism Q is provided, constructed as follows:—An inking roller Q', is journaled in the ends of an ink fountain Q^2, delivering the necessary amount of ink to the said inking roller. The inking roller Q' when in its normal position, as shown in Figs. 3 and 4, rests on the casing C at one side of the opening C', and the said inking roller is adapted to travel to the right over the type, previous to the ticket part H' of the paper H passing into a lowermost position, being carried there by the holder J, as before explained. The roller Q' remains in this position on the right hand side of the opening C' until a second ticket is to be printed. The fountain Q^2 is provided with arms Q^3, pivotally connected with disks Q^4, secured on a transversely extending shaft Q^5, mounted to turn in suitable bearings attached to the casing C, as will be readily understood by reference to Figs. 3 and 4. On the shaft Q^5 is secured a gear wheel Q^6, in mesh with a second gear wheel Q^7, also journaled in bearings attached to the casing C. The gear wheel Q^7 is engaged by a spring pressed pawl Q^8, pivoted on the rod G^2 connected with the lever G, so that when the treadle G^3 is pressed, as before described, the said pawl Q^8 imparts a rotary motion to the gear wheel Q^7, whereby the gear wheel Q^6 and the shaft Q^5 are given one half revolution, thus imparting a like motion to the disks Q^4 so that the arms Q^3 move the inking roller Q' forward over the type and type characters for one ticket, previous to the paper moving downward as before explained.

In order to disconnect the pawl Q^8 from the gear wheel Q^7, after the disks Q^4 have made a half revolution, the said pawl comes in contact, on its downward motion, with a pin Q^9, projecting from an arm secured to the casing A', see Figs. 3 and 4. Thus, when the half revolution of the disks Q^4 has been completed, the pawl Q^8 comes in contact on the downward movement of the rod G' with the said fixed pin Q^9, and is thus thrown out of mesh with the gear wheel Q^7 so that a further rotation of the latter, as well as the disks Q^4, is prevented. The pawl Q^8 now moves farther downward with the rod or link G^2, and on the

return movement of the latter glides over the teeth of the gear wheel Q^7 to be ready to actuate the inking mechanism at the next downward movement of the rod G^2. When this takes place the roller Q′ is moved over the type to ink the same and back into the position shown in Fig. 3.

In order to count the number of individual tickets printed by any one set of type E, a counting mechanism R is provided, similar in construction to the numbering mechanism K and the total counting mechanism P. Individual counting mechanisms R are arranged in the wheel D below each corresponding set of type E, and each of these mechanisms (shown in detail in Figs. 9 and 10) is provided with units, tens, hundreds, thousands, &c., wheels connected with each other by the mechanism previously described in reference to the consecutive numbering mechanism K and shown in Figs. 5, 6, 7 and 8. The units wheel R′ of this counting mechanism is provided with a ratchet wheel R^2, engaged by a pawl R^3, held on a bar R^4, mounted to slide in suitable bearings in the type wheel D. The upper end of each bar R^4 is adapted to project into the path of a lug F^3, on the platen F whenever the corresponding type E is in the opening C′ in the top of the casing C. A spring R^5, held on the said bar R^4 serves to move the latter into an outermost normal position. Now, when the platen F moves downward then the lug F^3 engages the bar R^4 of that counting mechanism, the type of which is on the top of the wheel D, so that the said bar is pressed downward and its pawl R^3 glides over the teeth of the ratchet wheel R^2. When the platen F moves upward, the spring R^5 moves the bar R^4 back into an uppermost position, and by doing so the pawl R^3 acts on the ratchet wheel R^2 so as to turn the units wheel R′ and the other mechanism, as the case may be, to count the ticket printed on the corresponding type E.

On the rear end of the platen F is arranged a longitudinally extending knife S, adapted to cut the ticket H′ in front of the holder J whenever the platen F makes the impression. The knife S does not extend the entire length across the ticket part H′ so that the latter is not entirely cut off from the paper, and consequently the ticket, after being printed, moves upward with the paper in the holder J so that the ticket is carried up away from the type and type characters and is shoved outward to the front by the next forward feeding of the paper H on the upward stroke of the lever G, as previously described.

The operation is as follows:—When the several parts are in the position shown in the drawings and the operator desires to print, for instance, a railroad ticket to the destination "Louisville," he first takes hold of the crank arm B^4 and moves the same to the mark C^2 bearing the name "Louisville," see Fig. 1. By turning the crank arm B^4 the type wheel D is rotated so that the corresponding type E representing the subject matter for a ticket to "Louisville" is in the top opening C′ of the casing C. The operator now presses, with his foot, on the treadle G^3, so that the link G^2, the lever G, and the plate F move downward, whereby the inking roller Q′ is first moved forward and backward over the type, after which the paper holder J is pressed downward to move the ticket part H′ over the type characters, and then, when the platen F is in a lowermost position, the operator strikes a blow on the arm F′, so that the said platen F causes an impression to be made on the ticket part H′, the type E, as well as the dating mechanism L and the consecutive numbering mechanism K, printing their corresponding type characters on the under side of the ticket part H′ and thus making a ticket. At the same time the knife S cuts the ticket partly off in front of the holder J. The total numbering mechanism P is actuated on the downward movement of the lever G to register the ticket, and in a like manner the counting mechanism R is actuated to register the ticket made by the individual type E from which the body of the ticket was printed. As soon as the operator releases the pressure on the treadle G^3 the spring G^4 moves the lever G and the platen F back to their normal positions, and at the same time the spring J^2 returns the holder J to an uppermost position, and the feed rollers I and I′ feed the paper H forward, so that the printed ticket projects beyond the front of the casing C and can be readily detached from the rest of the paper of which the part H′ projecting in front of the holder J will form the next ticket to be printed.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

1. In a ticket printing apparatus, the combination with a type wheel carrying in its periphery sets of type for printing various tickets and a counting mechanism arranged one for each set of type in the said wheel, to count the individual sets of tickets printed by each set of type, of a platen moving toward and from the said sets of type to make the impression and to actuate the said counting mechanism, a spring-pressed paper holder mounted to slide and formed with a slot through which passes the paper, the said holder being actuated by and moving with the said platen to bring the paper over the said type previous to the platen making the impression, an inking mechanism for inking the type previous to the downward movement of the said paper holder, and a paper feeding mechanism for moving the paper through the slot in the said holder and into the space between the type and platen, substantially as shown and described.

2. In a printing mechanism, the combination with a type wheel carrying in its periphery sets of type for printing the various tickets, and counting mechanisms arranged one

for each set of type in the said wheel to count the individual sets of tickets printed by each set of type, of a consecutive numbering and printing mechanism arranged next to the said wheel and having its uppermost type in line with the uppermost set of type in the said wheel, a platen moving toward and from the said sets of type to make the impression, the said platen being also arranged to actuate the said consecutive numbering mechanisms and the said counting mechanisms, a spring-pressed paper holder mounted to slide and formed with a slot through which passes the paper, the said holder being actuated by and moving with the said platen to bring the paper over the said type previous to the platen making the impression, an inking mechanism for inking the said type and the consecutive numbering mechanism previous to the downward movement of the said paper holder, and a paper feeding mechanism for moving the paper through the slot in the said holder and into the space between the platen and the type and consecutive numbering and printing mechanism, substantially as shown and described.

3. A ticket printing apparatus provided with a platen and a paper holder formed with a slot through which passes the paper, the said holder being pressed by a spring and mounted to slide and actuated from the platen, substantially as shown and described.

4. In a ticket printing apparatus, the combination with a movable platen, and a type wheel containing sets of type on which the platen makes an impression, of a paper holder formed with a slot through which passes the paper, the said holder being spring pressed and mounted to slide and adapted to be pressed by the said platen at the time the latter moves downward to make the impression, substantially as shown and described.

5. In a ticket printing apparatus, a type wheel provided with sets of type, a plate adapted to be moved toward and from the said type, a lever carrying the said plate, a link connected with a treadle and with the said lever for actuating the latter, in combination with an inking mechanism comprising a roller adapted to travel over the type in the said type wheel, arms carrying the said roller, disks pivotally connected with the said arms, a shaft carrying the said disks, gear wheels for rotating the said shaft, a pawl engaging one of the said gear wheels and pivoted on the said link, and a fixed pin adapted to engage the said pawl to throw the latter out of engagement with the corresponding gear wheel, substantially as shown and described.

6. In a ticket printing apparatus, an inking device comprising a roller for inking the type, arms in which the said roller is journaled, crank disks pivotally connected with the said arms, a shaft carrying the said disks and provided with a gear wheel, a second gear wheel in mesh with the said first named gear wheel, and a spring pressed pawl mounted to travel and engaging the said second gear wheel, substantially as shown and described.

7. In a ticket printing apparatus, an inking device comprising a roller for inking the type, arms in which the said roller is journaled, crank disks pivotally connected with the said arms, a shaft carrying the said disks and provided with a gear wheel, a second gear wheel in mesh with the said first named gear wheel, a spring pressed pawl mounted to travel and engaging the said second gear wheel, and a fixed pin for throwing the said pawl out of mesh with the said second gear wheel, substantially as shown and described.

ALBERT R. ABBOTT.

Witnesses:
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THOS. H. HASKELL.