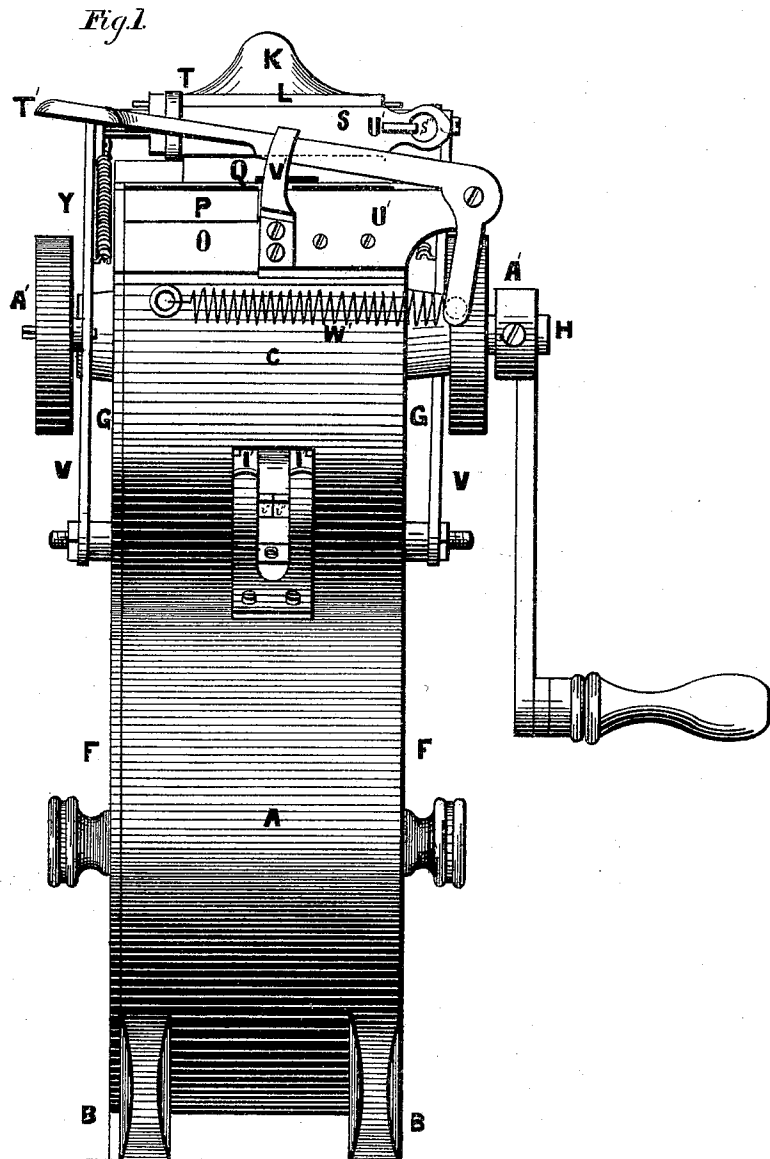


J. DYER.

Ticket Printing and Registering Apparatus.

No. 141,336.

Patented July 29, 1873.



Witnesses:

Gas E. Hutchinson
John R. Young

Inventor:

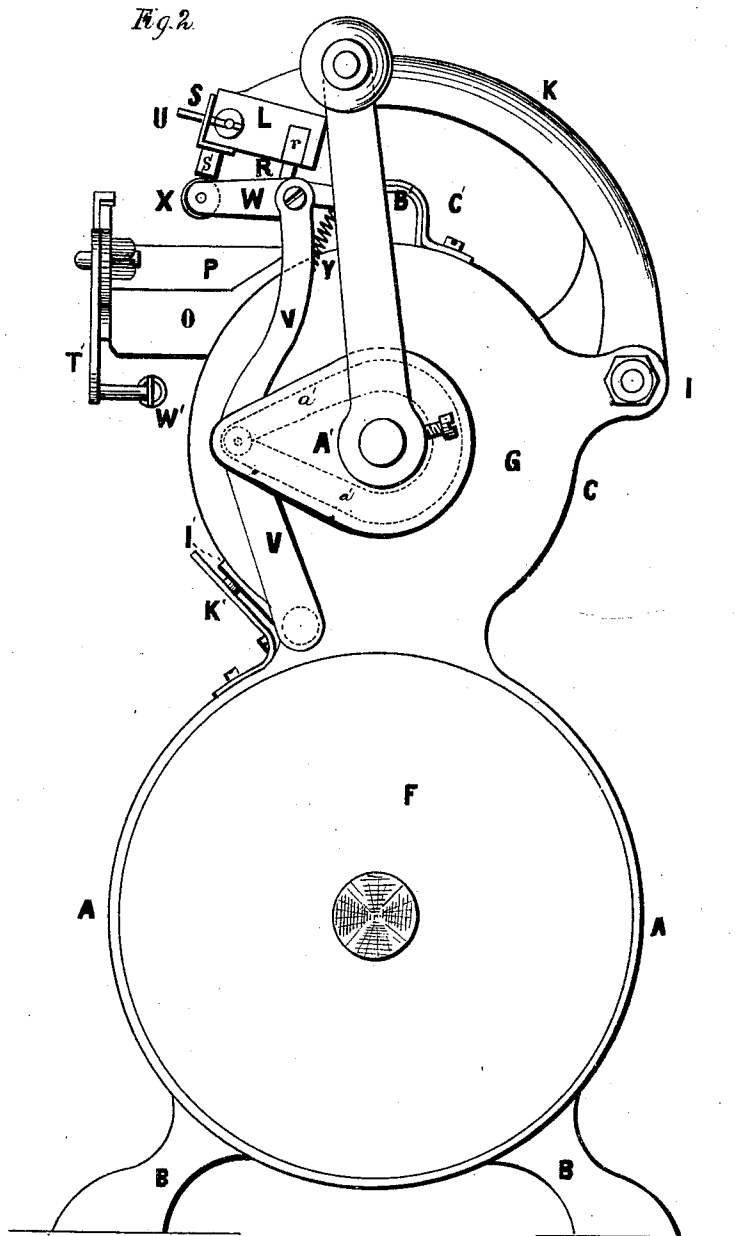
John Dyer, by
Prindle and Co. his Atty.

J. DYER.

Ticket Printing and Registering Apparatus.

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Witnesses:

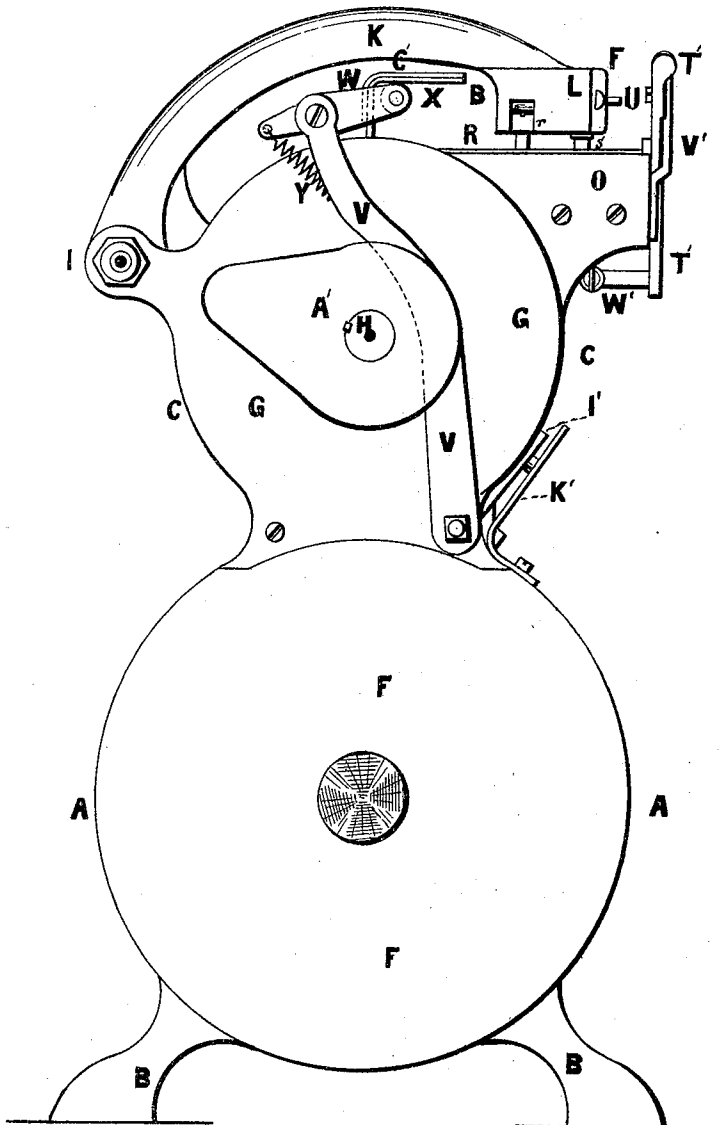
*Jas. E. Hutchinson
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Inventor:

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Ticket Printing and Registering Apparatus.
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Fig 3



Witnesses:

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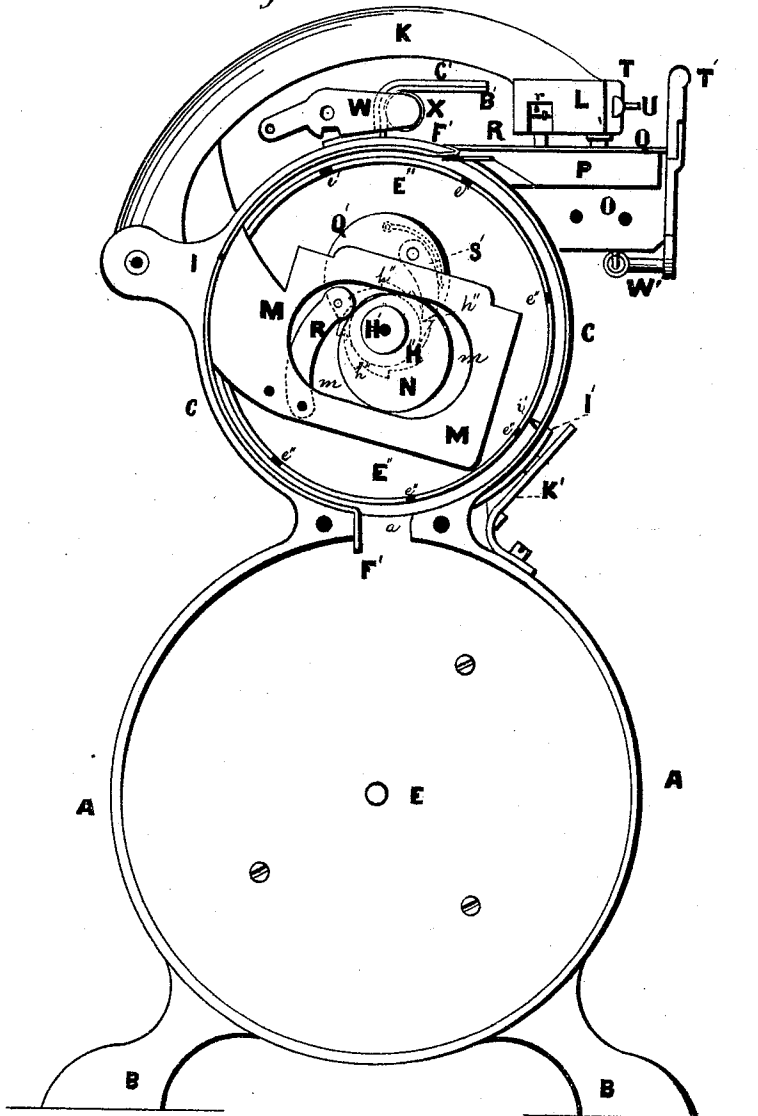
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Fig. 4.



Witnesses:

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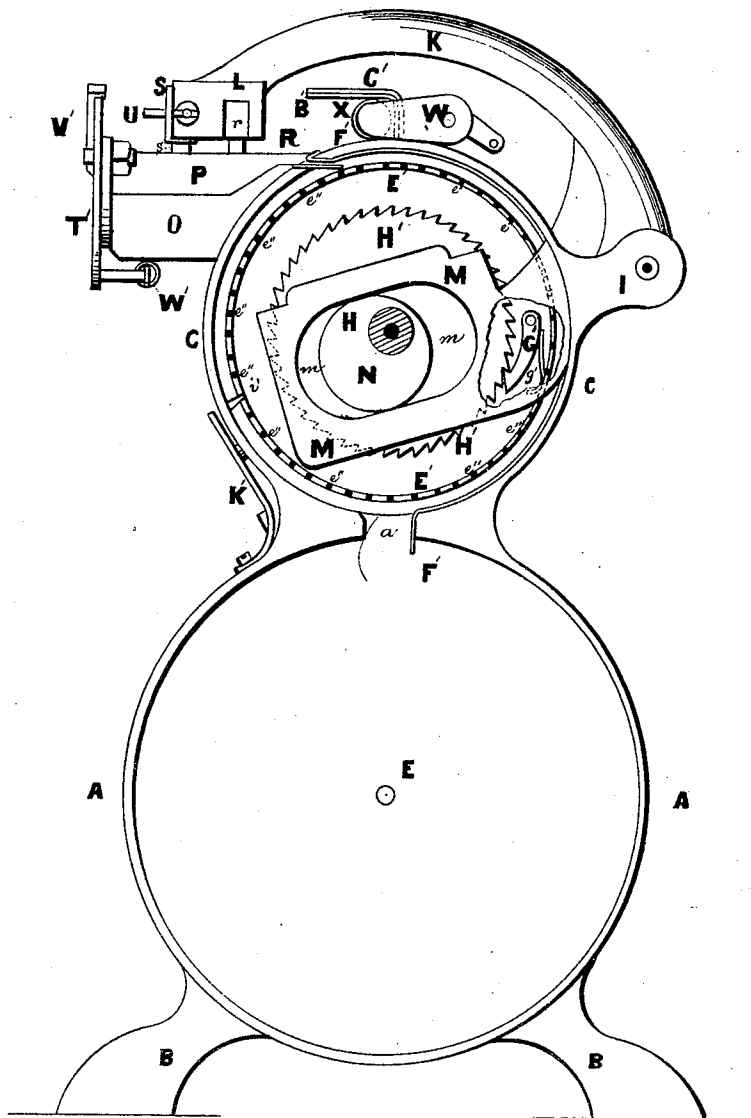
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Ticket Printing and Registering Apparatus.

No. 141,336.

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Fig. 5.



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Ticket Printing and Registering Apparatus.

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Fig 6

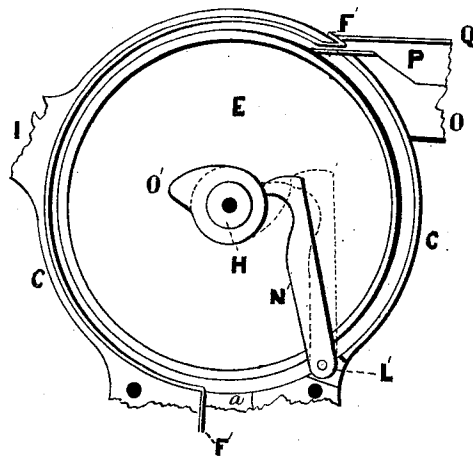
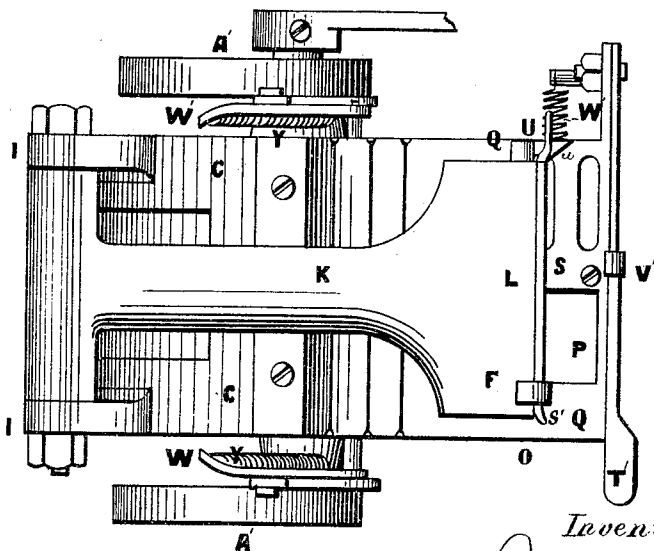


Fig 7



Witnesses:

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Ticket Printing and Registering Apparatus.

No. 141,336.

Patented July 29, 1873.

Fig. 8.

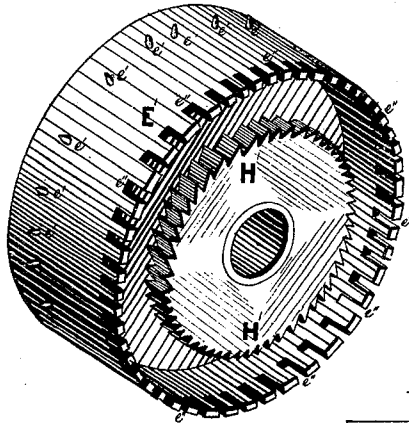


Fig. 10.

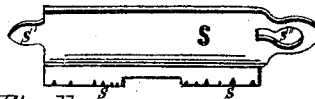


Fig. 11.



Fig. 9.

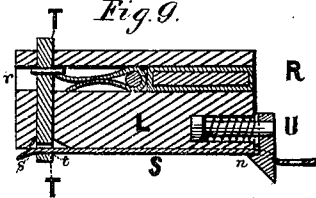


Fig. 12.

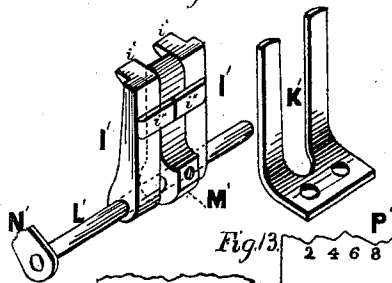
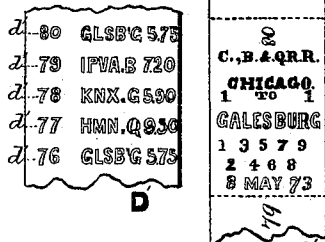


Fig. 13.



Witnesses:

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 John R. Young*

Inventor:

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UNITED STATES PATENT OFFICE.

JOHN DYER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN TICKET PRINTING AND REGISTERING APPARATUS.

Specification forming part of Letters Patent No. **141,336**, dated July 29, 1873; application filed May 9, 1873.

To all whom it may concern:

Be it known that I, JOHN DYER, of Chicago, in the county of Cook and in the State of Illinois, have invented certain new and useful Improvements in Ticket Printing and Registering Apparatus; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a front elevation of my improved apparatus. Figs. 2 and 3 are elevations of opposite sides of the same. Figs. 4 and 5 are like views of the same, with the casing removed so as to show the construction and arrangement of the interior mechanism. Fig. 6 is an end elevation of the feed-roller for the register-blank, showing the means employed for operating the releasing mechanism of the locking-pawls. Fig. 7 is a plan view of the upper side of the machine. Fig. 8 is a perspective view of a feed-roller, detached and enlarged. Fig. 9 is a horizontal central section of the holder and its dies. Figs. 10 and 11 are perspective views of the station and register dies. Fig. 12 is a perspective view of the locking-pawls, releasing mechanism, and spring; and Fig. 13 is a plan view of the register and ticket blanks.

Letters of like name and kind refer to like parts in each of the figures.

My invention is an improvement upon a ticket printing and registering machine for which Letters Patent No. 134,042 were granted to me upon the 17th day of December, 1872; and it consists, principally, in the employment of a continuous consecutively-numbered and partially-printed ticket-blank, in combination with suitable mechanism for feeding said blank forward, and for completing and severing the completed tickets, substantially as and for the purpose hereinafter specified. It consists, further, in the means employed for operating the feed rollers or cylinders, substantially as and for the purpose hereinafter shown. It consists, further, in the means employed for locking the feed-rollers in position, and for releasing the same at the proper time, substantially as and for the purpose hereinafter set forth. It consists, further, in the peculiar construction of the die employed for completing and for registering the ticket, substantially as and for the pur-

pose hereinafter specified. It consists, further, in the means employed for attaching the printing and registering die to its holder, substantially as and for the purpose hereinafter shown. It consists, further, in the means employed for insuring contact between the register and ticket blanks and their feed-rollers, substantially as is hereinafter set forth.

In the annexed drawing, A represents a short cylinder, resting upon and supported by means of suitable feet, B, and surmounted by a second smaller cylinder, C, as shown, the whole forming the frame and casing of the operating mechanism. Longitudinally the interior of the lower cylinder A is divided by means of a fixed partition, D, within which is secured a central shaft, E, that extends outward to the ends of said cylinder, and furnishes means for confining in position the heads F, which inclose the latter. The upper cylinder C has its ends inclosed by means of suitable heads G, within the centers of which is journaled a shaft, H, that actuates the operating mechanism. Extending rearward from the cylinder C are two lugs, I, between which is pivoted one end of a lever, K, that from thence extends upward and forward in a curve, and at its front end is provided with a cross-bar, L, within which are secured the dies. An arm, M, is secured to the rear end and lower side of the lever K, and, extending downward and forward within the casing C, is provided with an opening, *m*, that corresponds in width to the diameter of an eccentric, N, which latter is secured upon and revolves with the shaft H. The length of the slot *m* being equal to the throw of the eccentric N, it will be seen that the rotation of the latter will cause the forward end of the lever to be alternately raised and depressed. Secured to and extending horizontally forward from the front and upper sides of the cylinder C is a table, O, upon the upper side of which is placed a rubber cushion, P, that is held in place by means of the upward-projecting edges of said table, and by a covering-plate, Q, secured over its upper side, suitable openings for the passage of the type of the dies being provided in and through said plate, for which type said table and rubber form a bed. The length of the cross-bar L being sufficient to enable it to span the register and ticket blanks,

the dating-die R is secured within a longitudinal groove, *r*, which is provided within the lower face and near the rear side of said bar. The station and register die S, as shown in Figs. 2, 10, and 11, is formed of an angle-plate, that conforms to and embraces the front and lower sides of the cross-bar L, and upon the lower face of which plate are secured the type *s*. Upon one end of the die-plate is formed a spur, *s'*, which projects longitudinally outward and slightly forward in a curve, and when in place passes through a corresponding opening, *t*, in the end of a bar, T, which bar fits into a slot formed in the cross-bar or die-holder L, and at or near its rear end engages with a suitable spring that presses said bar rearward, so as to cause a pressure to be exerted upon the said spur *s'*, and holds the end of said die-plate firmly against its holder. The opposite end of the die-plate is extended beyond the corresponding end of the die-holder, and is provided with an opening, *s''*, which permits said end to pass rearward over a spring-latch, U, that works within a suitable guide formed upon or within the end of said die-holder. The engaging lip or shoulder *u* of the spring-latch extends inward over the outer face of the die-plate, while from the inner end of said shoulder said latch slopes outward and forward, as seen in Fig. 9, so that when said die-plate is pressed rearward, the inner end of its opening *s''*, bearing against said inclined face, shall cause said latch to be moved outward. After the die has passed the inner end of the shoulder of the latch, the latter springs inward to place and firmly locks said die in position.

To place the station and register die in position, its spur is inserted within the bar T, and its opposite end pressed rearward over the spring-latch U. To remove the die, the first finger of the right hand is placed against the rear side of the projecting end of said die, and the spring-catch released from engagement therewith by an outward pressure of the thumb.

In order that the dies may be properly inked at each operation, the following-described mechanism is employed: Two bars, V, are pivoted at their lower ends to or upon opposite sides, and near the front of the casing, and from thence extend upward to a point about upon a line with the lower side of the die-holder L. To the upper end of each bar V is pivoted a short bar, W, which extends forward for a short distance, and furnishes a bearing for an inking-roller, X, that is journaled within the same and the corresponding end of the opposite bar. To the rear short end of each bar W is attached one end of a spiral spring, Y, which from thence extends downward and has its opposite end attached to or upon the bar V, the arrangement of said spring being such as to cause the forward end of said bar W to be pressed upward, and the inking-roller to bear against the type of the dies. A reciprocating movement of the inking-roller is produced by means of a cam, A',

which is placed upon the operating-shaft II just outside of each pivoted bar V, and is provided, within its inner face, with a groove, *a'*, that receives a stud, *v*, which is secured to and extends laterally outward from said bar. The shape of the cam-grooves *a'* is such as to cause the ink-roller to move quickly forward and back beneath the dies, while the position of the cams V upon the shaft H causes said movement to occur at the instant when the lever K and die-holder L have reached the limit of their upward stroke. An inking-pad, B', is attached to or upon the lower side of a suitable plate, C', that is secured upon the upper rear side of the cylinder C, and extends upward and forward, as shown in Fig. 3, the position of said parts being such as to cause the inking-roller X to pass beneath and to the rear side of said inking-pad at each rearward movement. The completion of tickets is registered, as in my patented apparatus, upon a report-blank, D', which is provided with a series of consecutive numbers, *d'*, that are arranged thereon longitudinally and in regular order. A roller, E', journaled upon the shaft H within the cylinder, and provided with a set of radial studs or spurs, *e'*, is caused to revolve by means of suitable mechanism, hereinafter described, so as to feed said register-blank forward beneath the dies. The blank D' is contained within the lower cylinder A, from whence it passes upward through an opening, *a*, into the cylinder C, and from thence rearward, upward, and forward around the roller E' to the forward side of said cylinder C, where it passes outward through a suitable opening between the plate Q and cushion P.

The studs *e'* of the feed-roller may either fit into openings correspondingly placed within the register-blank, or they may be sufficiently pointed to cause them to engage with and move forward said blank without the formation of such openings. In order that the register-blank may be caused to closely embrace its feed-roller, a thin metal spring, F', is placed between said roller and the rear and upper sides of the interior of its casing C, and has its ends secured to the rear side of the opening *a*, and to the upper side of the opening through which said blank leaves said casing. The length of said spring is such as to cause it to draw against the periphery of said roller, to permit which a longitudinal opening is cut at its transverse center at the point where the spurs *e'* project. The feed-roller E' is rotated by means of a pawl, G', which is pivoted to or upon the arm M in rear of and in a line with the center of the cam-opening *m*, and engages with a ratchet-wheel, H', that is secured upon the hub of said roller. The size of the ratchet-wheel and the number of its teeth are such as to cause the vertical movement of the pawl G' to rotate the feed-roller the necessary proportion of an entire revolution to feed forward one number of the register-blank. The pawl G'

is held in engagement with the ratchet-wheel by means of a spring, g' , which is attached to its rear side, and, extending downward and rearward, bears against the inner face of the periphery of the feed-roller. The feed-roller E' is locked in place by means of a detent, I' , which is pivoted at its lower end within the lower front side of the casing C , and, working through a suitable opening in the latter, bears at its upper end against the surface of said roller near its inner edge. A spur, i' , projecting horizontally inward from the inner face and upper end of said detent, engages with a corresponding notch, e'' , which forms one of a series of like notches that extend around the periphery of said roller. A spring, K' , secured upon the outer side of the casing, bears against the outer side and upper end of the detent I' , and holds the latter in engagement with the feed-roller, while said detent is released at the proper time by means of the following-described mechanism: A rod or shaft, L' , is journaled within the casing in such a position as to form a bearing for the detent I' . Upon said shaft, beside said detent, is secured an arm, M' , which, extending upward beside said detent, bears against a lug, i'' , which extends laterally outward from said detent immediately in rear of the outer side arm, this arrangement being such as to cause the detent to be moved outward by a like movement of the arm. Upon the end of the shaft L' , immediately within the head G , is secured an arm, N' , which extends upward to a point about upon a line with the center of a shaft, H , and bears against a cam, O' , that is secured upon and revolves with said shaft, the conformation of said cam being such as to cause said arm to be moved suddenly outward, as shown by the dotted lines, at the precise instant that it is desired to release the detent and revolve the feed-roller.

The tickets employed are printed in regular order upon a strip of paper, P' , (seen in Fig. 13,) and contain the name of the railroad issuing the tickets, the name of the station from which such tickets are to be issued, together with such special marks as may be desired; and in addition thereto, said tickets are consecutively numbered from one upward. Immediately below the name of the issue station is left a blank space, upon which is printed, by means of the dies before described, the name of the station at which the fare terminates, and the date of the issue of the ticket. The ticket-blanks thus formed are contained within the lower casing A , and, by means of a feed-roller, E'' , are fed outward beneath the dies simultaneously with the register-blank. The feed-roller E'' is similar to the register-roller E' , the only point of difference being the number and arrangement of the studs e' and locking-notches e'' , said parts being comparatively few in number, and arranged at points upon or within the periphery of said roller that correspond in relative distance to the space between the lines of division upon

the ticket-blanks. An opening, p' , provided at the transverse center of the ticket-blank and upon each line of division between the tickets, receives one of the studs e'' of the feed-roller, and insures the accuracy of the feed. If desired, however, said opening may be omitted and said studs made pointed, so as to cause them to engage readily with the ticket-blank.

As the degree of rotation of the roller for feeding forward the ticket-blank exceeds the capacity of the mechanism employed for operating the register-blank feed-roller, the following-described means are employed for operating the former: A disk, Q' , is journaled upon the shaft H , immediately beside the eccentric N , and is connected with the arm M by means of a curved bar, R' , that is pivoted at one end to the contiguous face and near the lower side of the latter, and at its opposite end to or upon the inner face of said disk. Upon the outer face of the disk Q' is pivoted a pawl, S' , which engages with a ratchet-wheel, H'' , that is secured upon the hub of the feed-roller E'' , and is provided with suitable teeth h'' , which correspond in number to the divisions of the periphery of said roller, as indicated by the studs e'' . As thus arranged, the vibration of the arm M causes the disk Q' to perform a partial revolution upon the shaft H , and, by means of the pawl S' , give to the feed-roller just the required degree of forward movement to feed one ticket from the casing outward beneath the dies. When a ticket has been completed it is severed from the blank by means of a knife, T' , which is pivoted at one end upon the forward side of the table O , and is capable of being turned downward against or beside said table. In order to produce a better result, the front side of said table is protected by means of a steel plate, U' , the upper edge of which is sharpened and operates like one blade of a pair of shears. A guide-bar, V' , secured upon the front side of the table, extending upward beside, and then rearward over, the blade or knife T' , holds the latter in position against the plate U' and limits its upward movement. A spring, W' , secured at one end to or upon the lower side of the table O , and at its opposite end to an arm, t' , which projects downward from the pivotal end of the cutter, causes said cutter to assume the position shown in Fig. 1 whenever released from pressure.

The apparatus is now complete, and is used as follows: Each ticket agent is provided with a die for each station to which fares are to be sold, which dies are conveniently arranged within a suitably-constructed case, and for the purpose of insuring the use of the correct die each of the same has stamped or otherwise affixed to or upon its forward vertical face the name of its station and the price of the fare. When any particular ticket is desired the operator takes from the case, with his right hand, the corresponding die, inserts it within the attaching mechanism of the holder,

and, with the same hand, grasps the crank and gives it the necessary turn. The ticket beneath the die and the register are stamped and then fed forward by the movement of the crank, after which said ticket is cut from the strip by means of the knife, (which is pressed downward with the left hand,) and falls into a holder prepared for its reception. While completing the ticket the operator informs himself as to its value by a glance at the data affixed to the front side of the die. The ticket and register blanks being so arranged within the machine as to cause corresponding numbers to be fed forward at the same instant, it will be seen that no liability exists to such a derangement of the same as to cause a failure of said numbers to correspond.

At the close of sales for the day the operator severs the projecting portion of the register-blank, adds up the values of fares stamped thereon, and remits with said blank (which thus becomes a report) an amount equal to the total of such values, which total must correspond with his receipts.

The advantages obtained by my system and apparatus are: First, it obviates the necessity for keeping large and constantly increasing stocks of tickets at stations, the single form of blank used supplying the place of the separate tickets usually required for each station to which fares are sold. Second, by means of my system it is not possible to get out of tickets for any especial station while any remain on hand, while under the "many-blank" system it frequently occurs that a supply for some station runs out, and passengers are obliged to pay fare to the conductor upon the cars. Third, the large amount of time usually required for counting up ticket-blanks on hand, in order to ascertain and report the number of each kind sold, is rendered unnecessary, as the report-blank furnishes an accurate statement of sales, which sales can easily be closed up and reported after each train, if desired, instead, as heretofore, of being reported weekly or monthly only. Fourth, in consequence of the consecutive numbers of the tickets it is impossible that any can be sold out of their order, or dated ahead, and, through collusion between conductors and ticket agents, the company defrauded, while, from the same cause, the date upon which an illegibly-stamped ticket was sold can be easily and quickly determined. Fifth, the ticket agent is relieved from the responsibility occasioned by the care of a large stock of tickets, which, if stolen by watchmen or others, may be used and must be accounted for in the periodical settlement; and, in case two or more persons are required to make sales at a station, enables the account of sales of each to be accurately kept without possibility of error. Sixth, it prevents clerks at the general office from misappropriating tickets to their own use, and, by simplifying the accounts of said office with the ticket agents of the road, materially lessens the expense and the number of employes required. Seventh,

by completing each ticket at the time of its sale, and rendering it necessary that the ticket sold and used each day should come within certain numbers, it is rendered impracticable for printers to fraudulently print and issue tickets, as is now done to a great extent and at a serious loss to railroads.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. A continuous consecutively-numbered and partially-printed ticket-blank, in combination with suitable mechanism for feeding said blank forward, and for completing and severing the completed tickets, substantially as and for the purpose specified.

2. The means employed for operating the feed-roller E', consisting of the pawl G', pivoted upon and moving with the arm M, and the ratchet-wheel H', secured to said roller and engaging with said ratchet, substantially as set forth.

3. The means employed for operating the feed-roller E'', consisting of the disk Q', pivoted upon the shaft H', the curved bar R', pivoted to said disk and to the arm M, and the pawl S', pivoted upon said disk Q', and engaging with a ratchet-wheel, H'', attached to said roller, substantially as is shown and described.

4. In combination with the feed-rollers E' and E'', provided with the notches e'', the detents I', provided with the spurs i', and pivoted to or upon the casing A, substantially as and for the purpose specified.

5. In combination with the feed-rollers E' and E'' and detents I', provided with the lugs i'', the shaft L', journaled within the casing C, and provided with the arms M' and N', and the cam O', secured upon and revolving with the shaft H, substantially as and for the purpose shown.

6. The station and register dies S, consisting of the angle-plate base, provided with the type s, the spur s', and the opening s'', substantially as and for the purpose set forth.

7. In combination with the die S, provided with the spur s' and opening s'', the spring-bar T, provided with the opening t, fitted into the face of the die-holder L, and engaging with said spur s', and the spring-latch U working within the end of said die-holder, and engaging with said opening s'', substantially as and for the purpose shown and described.

8. In combination with the feed-rollers E' and E'', provided with the engaging studs e', the springs F', partially encircling said rollers and pressing against the same, the register and ticket blanks, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of April, 1873.

Witnesses:

JOHN DYER.

GEO. S. PRINDLE,
JOHN R. YOUNG.