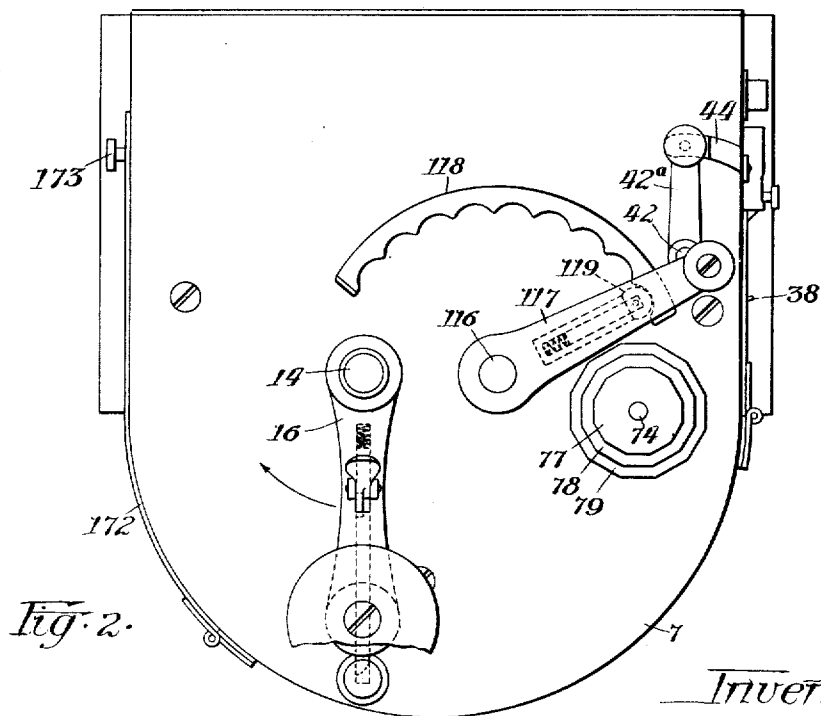
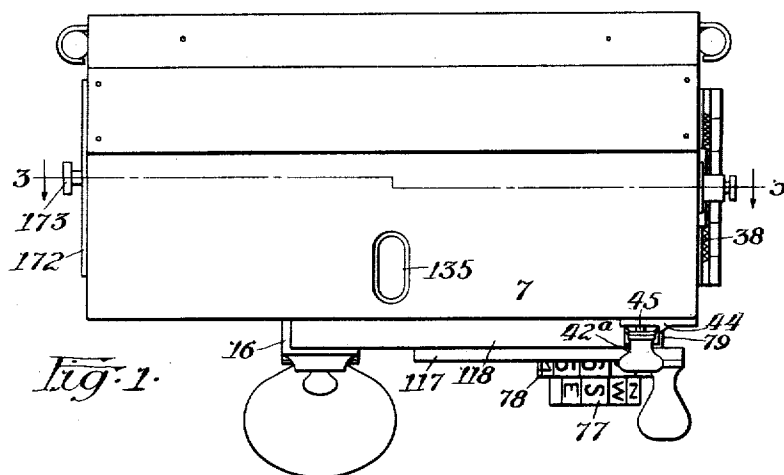


R. NORTH.
TICKET PRINTING AND ISSUING MACHINE.
APPLICATION FILED MAR. 8, 1909.

939,297.

Patented Nov. 9, 1909.

6 SHEETS—SHEET 1.



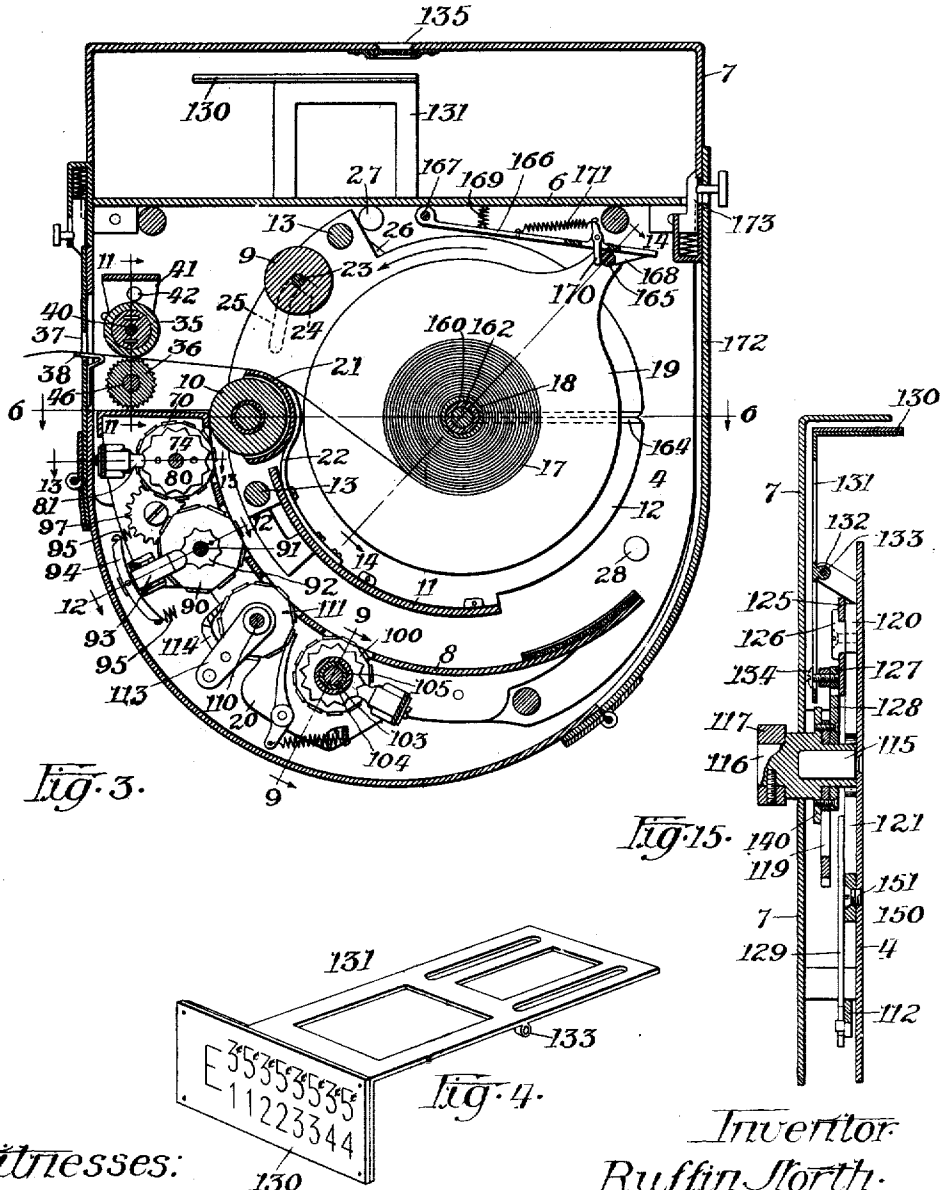
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 5 SHEETS—SHEET 2.



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6 SHEETS—SHEET 3.

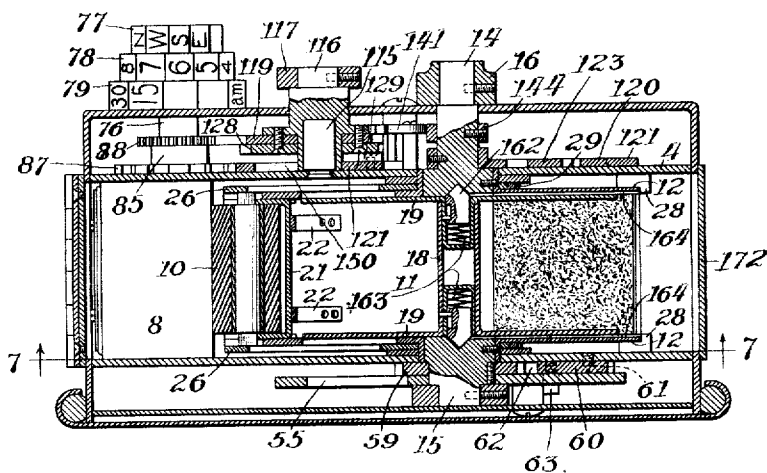
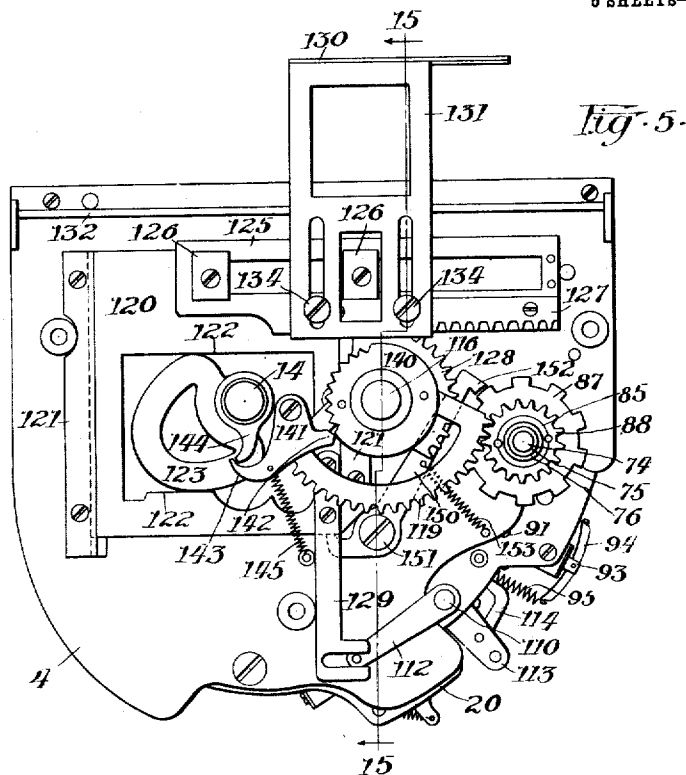


Fig. 6.

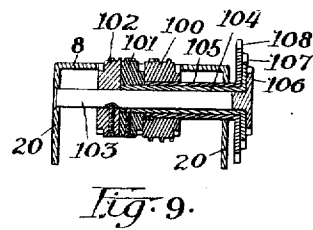
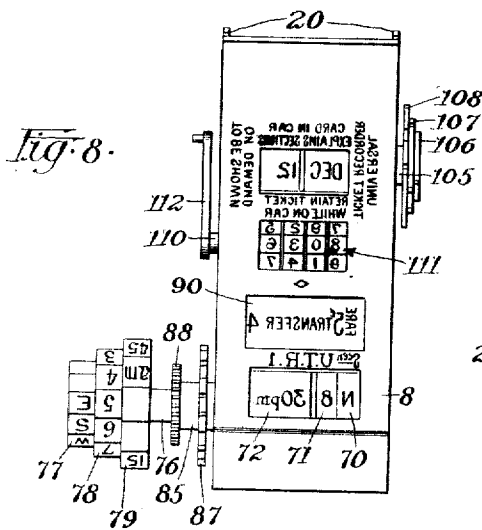
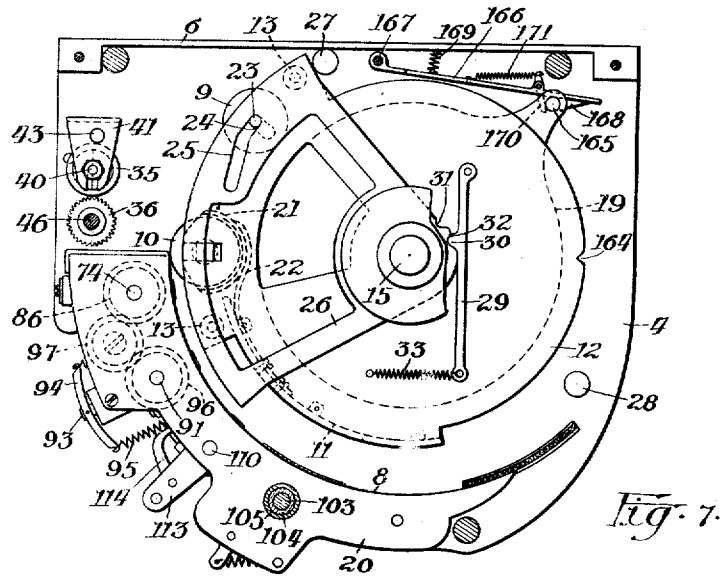
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939,297.

Patented Nov. 9, 1909.
6 SHEETS—SHEET 4.



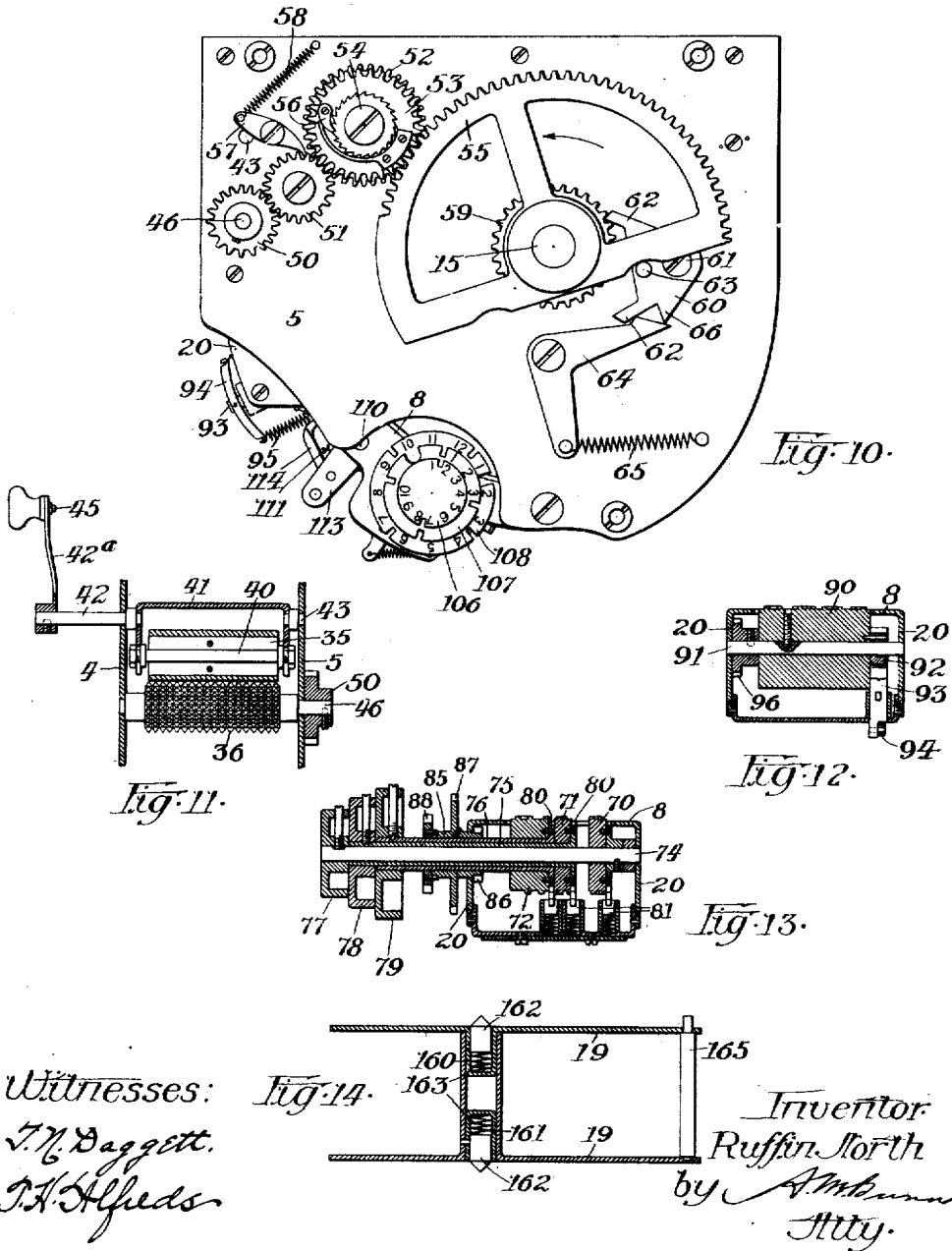
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TICKET PRINTING AND ISSUING MACHINE.
 APPLICATION FILED MAR. 6, 1909.

939,297.

Patented Nov. 9, 1909.
 6 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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TICKET PRINTING AND ISSUING MACHINE.

939,297.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed March 6, 1909. Serial No. 461,743.

To all whom it may concern:

Be it known that I, RUFFIN NORTH, a citizen of the United States, and a resident of Paris, France, have invented certain new and useful Improvements in Ticket Printing and Issuing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to machines for use in issuing tickets wherein the date, the consecutive numbers, the stages of the trip, and other matter is printed upon the tickets.

The present invention embraces improvements in various features of a machine for the same purpose set forth in a prior application for patent, Serial Number 237,350, filed by me December 17th, 1904.

In the accompanying drawings, which illustrate machine for printing and issuing tickets constructed according to my invention,—Figure 1 is a top plan view of the machine. Fig. 2 is a face view of the machine. Fig. 3 is a sectional view showing the internal mechanism, taken on line 3—3 of Fig. 1. Fig. 4 is a perspective view of the movable scale plate of the machine. Fig. 5 is a face view of the main frame of the machine, removed from the exterior casing, showing the means for operating the internal mechanism. Fig. 6 is a plan section of the machine, taken on line 6—6 of Fig. 3. Fig. 7 is a sectional view, taken on line 7—7 of Fig. 6, showing in side elevation the type-carrier and paper-carrier. Fig. 8 is a face view of the type-carrier. Fig. 9 is a sectional view of the type wheels for printing dates, and supporting means therefor, taken on line 9—9 of Fig. 3. Fig. 10 is a side view of the frame of the machine removed from the casing, showing the devices for operating the feed rollers. Fig. 11 is a detail section, taken on line 11—11 of Fig. 3, showing the feed rollers. Fig. 12 is a detail section, taken on line 12—12 of Fig. 3, showing the type-wheels for printing the rates of fare. Fig. 13 is a detail section, taken on line 13—13 of Fig. 3, showing the type-wheels for printing hours of the day and direction of travel. Fig. 14 is a detail sectional view of the paper-spool, taken on line 14—14 of Fig. 3. Fig. 15 is a detail section, taken on

line 15—15 of Fig. 5, showing only the parts exterior to the forward frame plate.

As shown in the drawings, the frame of the machine in which the principal operative parts are mounted embraces two rigidly connected side plates 4 and 5 and a top plate 6, and the said frame, with the operative parts carried thereby, are inclosed by an external inclosure or casing 7. The devices for printing the tickets include a type-carrier 8 of curved or segmental form and on the inner curved face of which the printing types are located, an impression roller 9, an inking roller 10, said impression and inking rollers having oscillatory motion about an axis concentric with the segmental type-carrier, and an oscillatory paper-carrier consisting of two disks 12, 12 which are rigidly connected with each other by means of transverse rods 13, 13, and a curved plate 11 attached to and extending between the margins of the disks. Said disks 12, 12 are provided with rigidly attached, outwardly extending pivot studs 14, 15, which are arranged concentrically with the segmental type-carrier 8 and which extend through and have bearing in the said side plates 4 and 5. The said paper-carrier is given oscillatory movement through the medium of a crank-handle 16 secured to the pivot stud 14 outside of the front wall of the casing 7 of the device. The roll of paper indicated by 17, is applied to a spool or paper-holder which is rotatively held between the disks 12, 12 of the paper-carrier and consists of a central tube 18 and two disks 19, 19.

The type for printing the tickets are supported in the type-carrier 8 between the two side plates 20, 20 of said carrier in such manner that the printing surfaces of the types, when in operative position, are at equal distances from the pivotal axis of the paper-carrier. On said paper-carrier, between the marginal parts of the disks 12, 12, are mounted the impression roller 9 and the inking roller 10. In the oscillatory movement of said paper-carrier said inking roller is carried over the types, for supplying ink thereto, and the impression roller is carried over the types to press the strip of paper against the same. A shield 21 of curved or cylindric form extends over the inner face of the inking roller to prevent contact of the strip of paper with said roller. The said

inking roller is provided with a spindle, the ends of which extend through radial slots in the margins of the disks 12, 12, as shown in dotted lines in Fig. 7, and the shield 21 is provided with end plates arranged parallel with and inside of said disks, and which extend between the ends of the inking roller and the disks, so as to bear outwardly against the spindle of the said inking roller at both ends of the same as shown in Fig. 6. Spring arms 22, 22 are attached to the plate 11, which latter plate is located with one of its ends near said inking roller, and said arms act on the shield to press the same outwardly so that they serve to hold the inking roller in its outward position with spring pressure, while permitting said inking roller to adjust itself to the type on the type carrier as it passes over the latter. The spindle 23 of said impression roller 9 (Fig. 7) extends at its ends through radial slots 24, 24 formed in the marginal parts of the disks 12, 12 and the outer ends thereof are engaged by cam grooves 25, 25 formed in the marginal part of swinging sector-shaped arms 26, 26 which are located at the outer faces of said disks and are engaged with the pivot studs 14 and 15, so that said arms are adapted to swing or oscillate on the disks about an axis concentric therewith. As shown, said sector-shaped arms are of skeleton form consisting each of two radial spokes and a marginal, curved, connecting member, in which latter is formed the cam slots 25. Two pairs of fixed stops 27, 28 are secured to the frame plates 4 and 5 in position for contact therewith of the opposite edges of the arms 26, 26 when the paper-carrier approaches the end of its swing in each direction, as it is turned or oscillated, so that said arms 26, 26 will be swung or moved relatively to the paper-carrier at each turning movement of the latter; the cam grooves 25, 25 of said arms serving to move or shift the impression roller either toward or away from the types in the manner hereinafter described. The disks 12, 12 are provided with radial stop-shoulders, arranged at a distance between the opposite edges of the arms 26, 26, said shoulders being adapted for contact with the stops 27 and 28 so as to limit the swinging movements or oscillations of the paper-carrier in both directions.

Each of the disks 12, 12 has on its outer face a pivoted arm 29 (Fig. 7) provided with a lug or projection 30 adapted for engagement with either one of two notches 31, 32 formed in the pivoted ends of the arms 26, 26 which are concentric with the pivotal axes of the disks 12, 12. A spring 33, acting on the swinging end of the arm 29, presses the lug 30 into engagement with said notches. Engagement of the lug 30 with one or the other of the said notches serves to hold the arms 26, 26 yieldingly

from swinging movement relatively to the disks 12, 12 so that said arms move with said disks in the swinging or oscillatory movement of the latter until the movement of the arms is arrested by contact of the same with one pair of the stops 27, 28.

Two feed rollers 35, 36 are mounted between the side plates 4 and 5 above the upper end of the segmental type-carrier 8 and adjacent to a slot or opening 37 which is formed in the side wall of the casing 7 for the passage of the printed strip of paper from said casing. The strip of paper passes from the roll of paper 17 between the impression and inking rollers to the feed rollers, and the impression roller acts on the part of the strip, between the feed rollers and the roll of paper, to carry and press the same against the types, in the advance or printing movement of the paper-carrier. Said feed rollers are intermittently actuated, through the turning movement of the paper-carrier, so as to deliver from the machine the printed part of the strip or ticket. After passing from said feed rollers 35 and 36 the strip passes over a cutting plate 38 (Figs. 1 and 3), against the serrated edge of which the strip may be drawn or pressed to sever the printed end of the strip which forms a ticket. The plate 38 is shown as attached to the side wall of the casing below the slot 37, with its cutting edge outside of the slot, so that the strip of paper may be severed by drawing its outer end downwardly over said cutting edge. The lower roller will be made of metal and roughened or provided with outwardly projecting horizontal projections on its entire surface, while the upper roller will have a covering of rubber or the like, so that the strip of paper, as it passes between the rollers is punctured or indented in a manner to prevent erasure of or changes in the printed matter thereon.

The uppermost feed roller 35 is attached to a shaft 40 which is mounted at its ends in the end plates (Fig. 11) of a U-shaped frame 41, mounted between the frame-plates 4 and 5. Said frame 41 is pivotally supported in the said plates 4 and 5 by means of bearing studs 42, 43 on the frame 41 engaging bearing apertures in said plates 4 and 5, the said studs being located above the axis of the roller, so that by the turning of said frame 41 said feed roller may be shifted away from the lower feed roller to permit the free withdrawal of the paper. Said bearing stud 42 is shown as being extended outwardly through the front wall of the casing 7, and as provided, outside of said front wall with a crank-handle 42^a, by which the said upper feed roller may be moved or swung toward and from the lower feed roller. A stop-plate 44 is attached to the front plate of the casing to limit the swing of the crank-arm 43, and the latter is provided with a stud 45 adapted to

engage a notch or recess in said stop plate, through the resiliency of said crank-arm, so as to hold the upper roller in its operative position. For actuating the said feed rollers 35 and 36, the lower feed roller 36 is provided with a spindle 46 which has secured thereto, at one end, outside of the frame plate 5 (Figs. 10 and 11), a gear-wheel 50 adapted to mesh with a gear-wheel 51 mounted on the said frame-plate 5. Said gear-wheel 51 is driven or rotated through the medium of toothed wheels 52 and 53, mounted on a bearing stud 54. The gear-wheel 52 is located adjacent to the plate 5 and intermeshes with the gear-wheel 51. The toothed wheel 52 is in mesh with a toothed segment 55 secured to the pivot stud 15 of the paper-carrier. The wheels 52 and 53 are loosely mounted upon the fixed stud 54 and the wheel 53 is provided with a spring-pressed pawl 56 which engages ratchet teeth formed on the hub of the wheel 52. By the action of said pawl and ratchet teeth, said feed rollers are permitted to remain stationary during the printing operation, when the paper-carrier and segment 55 are moving in the direction indicated by the arrow in Fig. 10, the wheel 53 at this time rotating freely and the gearing being inoperative. During the reverse rotation of the paper-carrier and said segment 55 the pawl 56 engages said ratchet teeth and rotates the feed rollers through the action of the gear-wheels 50, 51 and 52. A pawl 57, pivoted to the plate 5 and actuated by a spring 58, acts on the gear-wheel 51 to prevent any backward turning of the feed-rollers 35 and 36.

The segment 55 has attached to it a toothed wheel 59 which is engaged by a detent 60 which is pivoted on the frame plate 5 by a pivot stud 61 to permit the said wheel 59 to turn in both directions, but is adapted to restrain said wheel 59 from backward movement if any attempt be made to swing the paper-carrier backwardly at a point intermediate between the extremities of its normal range of movement, required for effecting the operation of the printing device. The said detent has two holding-teeth 62, 62, one or the other of which is adapted for engagement with the teeth of the wheel 59 when the detent is swung or oscillated on the stud 61. Said detent is provided with a stop-pin 63 located in position to be acted on by opposite edges of the segment 55, as the latter reaches the limit of its swinging movement in both directions, so that one of the holding teeth 62, 62 will, by the swinging movement of the detent imparted thereto by the segment 55, be brought into holding engagement with said wheel 59 at the termination of the rotative movement of the paper-carrier in each direction. A lever 64 is pivoted to the plate

5 with one of its arms in position to bear on the detent 60, and a spring 65 acts on said lever to keep it constantly pressed against said detent. Said detent has a tooth 66 which acts to press outwardly the end of the lever 64 as the detent is swung or shifted, said lever bearing on the detent at one side or the other of said tooth 66 to hold one or the other of the teeth 62, 62 in engagement with the wheel 59. The paper-carrier, therefore, can be turned first in one and then in the other direction, but will be locked or held from reverse or backward movement except at the ends of its swing or stroke in each direction.

The apparatus illustrated is more particularly intended for use on street railway lines, and is provided with means for printing upon the ticket issued, characters indicating the direction of travel, at north, east, south and west, as well as the hour of the day during which the ticket is issued; the designation of the time of issuance of the ticket being especially desirable where some of the tickets are used as transfers to other lines, it being understood that a ticket will be issued upon the receipt of each fare, which will serve as a receipt and will be held by the passenger during the trip to show that his fare has been paid, and that in the case of transfers the same will entitle the holder of the ticket to a ride upon an intersecting or connecting line.

As illustrated, the devices for printing characters indicating the direction of travel and the time of day, are more particularly shown in Figs. 8 and 13, and are constructed as follows: 70, 71 and 72 indicate three type-wheels which are sustained upon a common supporting shaft 74 which is mounted in the side plates 20, 20 of the type-carrier. The type-wheel 70 is provided with type designating the direction of travel, as "N. S. E. and W." The type-wheel 71 is provided with type indicating the hours of the day, running from 1 to 12, and the type-wheel 72 is provided with type indicating quarter hours, expressed by the figures "15", "30" and "45", these latter figures being duplicated upon the wheel having associated with them the letters "A. M." and "P. M."

The type-wheel 70 is attached directly to the shaft 74, the type-wheel 71 is attached to a sleeve 75, which surrounds said shaft, and the type-wheel 72 is attached to a second sleeve 76, which surrounds the sleeve 75. Said shaft 74 and the sleeves 75 and 76 are extended through the front wall of the casing 7, and attached to the outer ends of said shaft and the sleeves are three indicator wheels or disks 77, 78 and 79. The outermost indicator disk 77 is attached to the shaft 74 and is provided with the letters "N. S. E. W.", arranged thereon to correspond with the location of the type on the

type-wheel 70. The indicating disk 78 is provided with numbers to indicate the hours, corresponding with those on the type-wheel 71, and the indicating disk 79 is provided with numerals and letters corresponding with those on the type-wheel 72. Each type-wheel, 70, 71 and 72 is provided with a notched disk, indicated by 80, engaged by a spring pressed detent 81, by which the type-wheel is held yieldingly from rotation. These type-wheels are turned or shifted severally by the conductor from time to time, by the turning of the indicator disks 77, 78 and 79. The apparatus shown is also provided with means for printing on the ticket, characters indicating different parts or stages of a trip, the amount of fare for which the ticket is issued, and a word such as "transfer" to indicate that the ticket issued is good for a ride on an intersecting line. As shown, the numbers "1, 2, 3 and 4" indicate portions or stages of a route in which fares are received and transfers issued, and two rates of fare are provided for, designated by "3" and "5". The type indicating the fare and other items are formed or mounted on a type-roller 90, which is mounted on a shaft 91, as seen in Figs. 2, 3, 5, and 12. The characters indicating the amount of fare collected and the stage of the trip, are arranged longitudinally on the roller, so that they will be printed on one line. Where a transfer is to be issued, the word "transfer" will be printed in the same line with the characters designating the amount of fare and the stage of the trip as seen in Fig. 8. The said shaft 91 is mounted at its ends in the side plates 20, 20 of the type-carrier 8. Means are provided for holding the said type-roller 90 yieldingly from rotation consisting as shown, (Fig. 3) of a notched disk 92 engaged by a radially sliding detent 93, to the outer end of which is connected a yoke piece 94, to the ends of which are connected coiled springs 95, 95, which act to hold said detent yieldingly against the said notched disk. At its forward end, the shaft 91 has attached to it a gear wheel 96, which is located inside of the adjacent side plate 20 of the type-carrier.

The roller 90 is mounted in the type-carrier adjacent to the type-wheels 70, 71 and 72, hereinbefore described, and on the sleeve 76 of the type-wheel 72 is mounted a rotative sleeve 85, through the medium of which rotative movement is communicated to the said roller 90. Said sleeve 85 extends through the adjacent side frame 20 of the type-carrier, and is provided inside of said plate with a gear-wheel 86 which imparts movement to the gear-wheel 96 on the shaft 91 of the roller 90 through an intermediate gear-wheel 97. Outside of the side plate 20, the sleeve 85 is provided with a notched locking disk 87, arranged outside of and ad-

acent to the frame plate 4. On the outer end of said sleeve 85 is rigidly secured a gear-wheel 88, by means of which rotative motion is communicated to the said sleeve 85, as will hereinafter be more particularly described. The devices for printing the date and consecutive numbers of the ticket are also mounted on the carrier 8. The date printing device, as shown in Figs. 3, 9 and 10, comprises type wheels 100, 101, 102 for printing the names of the months and numerals indicating the days of the month. These wheels are mounted on a spindle 103, mounted in the side plates 20, 20 of the type-carrier. The type-wheel 102 is attached directly to the spindle 103, while the type-wheel 101 is attached to a sleeve 104 which surrounds said spindle, and the type-wheel 100 is mounted on a second sleeve 105 which surrounds the sleeve 104. Said spindle and the two sleeves are extended outside of the side plate 20 at the rear of the machine. On the outer extremities of the said spindle and sleeves are mounted disks 106, 107 and 108, marked to correspond with the type-wheels 100, 101 and 102, and which may be turned separately to effect the adjustment of the type-wheels. Said disks 106, 107, 108 are located inside of the outer casing of the machine and are accessible through a door or opening in the rear wall of the casing, which can be opened only by a person authorized to do so, so that the date cannot be changed by the conductor or person handling the apparatus.

The device for printing the consecutive numbers on the ticket comprises a spindle 110, (Figs. 3, 5, 7 and 10) on which are loosely mounted a plurality of type disks 111, as seen in Fig. 8. The spindle 110 extends through the side plates 20, 20 of the type-carrier, and one end of said spindle projects through the forward plate of the type-carrier and has secured to it a crank-arm 112, through which rocking movement is given to said spindle. Said spindle 110 also has attached to it a rocking arm 113, provided with a pawl plate 114, having teeth of different length adapted to engage the notches in the type disk; these parts being constructed and operating in the same manner as is common in consecutive numbering devices of the same character.

Devices are provided for effecting rotative adjustment of the type-roller 90, for operating the crank-arm 112 of the consecutive number printing device, and for indicating to the eye of the operator, the amount of fare, the stage or section of the trip or other characters on the type roller 90, which are at any time presented in position for printing, these parts being constructed as follows:

A stud 115, (Figs. 5 and 6) is attached to and projects outwardly from the frame plate

4, and on said stud is mounted a rock-shaft 116 which extends outwardly through the front wall of the exterior casing 7 of the apparatus. The rock-shaft 116 is provided, 5 outside the front wall of the casing, with a rigidly attached crank-arm 117 to which oscillatory movement may be given by the operator for effecting adjustment of the fare-printing device. The swinging end of said 10 crank-arm 117 is provided with a spring-actuated holding detent operating in connection with a notched segment 118 secured to the outer face of the front wall of the casing to hold said arm yieldingly from 15 movement when placed in either one of a plurality of positions, these parts being made like the corresponding parts shown in the prior application for patent hereinbefore referred to. Attached to the rock-shaft 116 20 is a gear-segment 119 which intermeshes with the gear-wheel 88, which is connected to the gearing described with the shaft 91, so that the type-roller 90 on said shaft has rotative adjustment to correspond with the 25 positions of the crank-arm 117. By shifting said crank-arm 117, the type-roller will be brought into position with either line of type thereon in position for printing.

120 indicates the vertically sliding or reciprocating plate engaged at its side margins with guide strips 121, 121, attached to the frame plate 4 at the front of the machine (Figs. 5 and 6). Said plate is provided with a space or opening through which 35 passes the pivot stud 14 of the paper-carrier and which has horizontal top and bottom bearing faces 122, 122. Attached to said pivot stud 14 is a cam-arm 123 having bearing engagement with the horizontal bearing 40 surfaces of the plate 120. Said cam-arm gives vertical reciprocatory movement to the said plate when the pivot stud 14 is rocked or rotated backwardly and forwardly for giving motion to the printing 45 mechanism. The type-disks 111, for printing consecutive numbers on the tickets are operated from the said plate 120, operating devices for this purpose consisting of a downwardly extending arm 129 on said plate 50 120, adapted to act upon and give oscillatory movement to the crank-arm 112 attached to the spindle 110 through which the said type-disks 111 are operated. Mounted on said plate 120 is a secondary plate 125 which 55 has lateral sliding or horizontal movement thereon. As shown, the plate 125 is provided with a longitudinal, horizontal slot, the top and bottom edges of which engage two guide-blocks 126, 126 secured to the 60 front face of the plate 120. Attached to the lower margin of said plate 125 is a horizontal rack-bar 127 located above the rock-shaft 116, and provided with downwardly facing teeth which are adapted for inter- 65 meshing engagement with the teeth of a

gear-segment 128 attached to said rock-shaft 116. A connection is thereby afforded between said secondary plate 125 and said rock-shaft whereby said plate will be shifted laterally on the main plate 120 to bring 70 the same into positions corresponding with the positions occupied by the crank-arm 117 on the notched segment 118. The rack-bar 127 is engaged with the gear-segment 128 only when the plate 125 is in its lowermost 75 position, and when said plate 125 is lifted or thrown upwardly the said rack-bar and gear-segment are disengaged from each other.

The notched segment 118 on the front wall 80 of the machine casing is provided with a series of notches, adapted to be engaged by the spring-actuated detent 119 on the crank-arm 117, and said notches are spaced to correspond with the positions occupied by the 85 fare printing roller 90 when the same is shifted to bring one or the other of the lines of type thereon in position for printing, so that the operator, by swinging or moving 90 said crank-arm, may set the apparatus for printing from either of said lines of type on said roller 90, as desired; the said rock-shaft 116 having geared connection with the spindle 91, as hereinbefore stated, so that the ro- 95 tative adjustment of said rock-shaft brings said secondary plate 125 into a position corresponding with the line of types on the type-wheel which is brought into position for printing by the turning of said rock- 100 shaft.

In order to indicate to the eye of the operator the lateral position of the secondary plate 125 or, in other words, the particular 105 line of types or characters which are adjusted to make an impression on the paper at any particular time, a construction is provided as follows: 130 indicates a laterally movable, horizontal scale or indicator plate, located at the top of the machine below the 110 top wall of the casing, and attached to a vertical supporting plate 131 which is connected with the plate 125 by means affording lateral movement of the scale plate with said plate 125 without any vertical movement in said scale plate. 115

As illustrated, the supporting plate 131 is mounted to slide laterally on a horizontal guide rod 132, extending across the front of the machine frame and engaged by guide- 120 lugs 133, 133 on the plate 131. Said plate 131 extends downwardly in front of the plate 125 and has vertically sliding connection with said plate 125 by means of two screw studs 134, 134 which pass through up- 125 right guide slots in the opposite sides of said plate 131. The scale plate 130 is arranged below and parallel with the top plate of the casing 7, and in said top plate is provided a sight opening 135, through which may be observed the marks on the scale 130

plate. By observation of the scale plate through said sight opening, as the crank-arm 117 is manually moved or swung to shift the type-roller 90, the operator may adjust the said roller for the operation of either of the lines of type thereon, as desired.

As hereinbefore stated, the apparatus illustrated is one designed for use on a street railway line where the route is divided into a number of zones or sections in which transfers are given to other lines and the apparatus is adapted to print on the tickets or receipts issued for fares, at the rate of five cents and three cents, in each transfer zone or section. In this apparatus, therefore, the scale-plate 130 is marked to indicate five and three cent fares for each of four transfer zones or sections, which latter are indicated by the characters 1, 1, 2, 2, 3, 3, 4, 4, also marked on the scale plate. These indicating characters referred to also include, as shown, the letter "E" indicating "exchange" and is used for indicating tickets or transfers which entitle the holder to ride on another or intersecting line. The characters on said scale plate will be spaced at distances apart corresponding with the several lateral positions of the plate 125, and corresponding with the several adjusted positions of the type-roller 90. In order to prevent any movement of the crank-arm 117 or any operation of the printing mechanism, except when the fare-printing roller 90 is adjusted in one of its printing positions, a locking device is provided as follows:

On the rock-shaft 116, outside of the gear segment 119, is formed or secured a disk 140 provided at one side thereof with a series of V-shaped notches corresponding in number and angular distance apart with the notches in the segment 118 and with the several positions to which the type-roller 90 is shifted for printing different rates of fare and the like. On the plate 4 is mounted a detent lever 141, arranged to swing on an axis located between the pivot stud 14 and the rock-shaft 116. Said detent 141 has a holding tooth 142 adapted to engage the notches in the disk 140 and is also provided with a hooked end 143 adapted for engagement with a rigid arm 144, attached to the pivot stud 14. A spring 145 acts on the detent lever 141 in a direction to press the tooth 142 thereof against the disk 140. When the parts are in their normal or inoperative position, as shown in Fig. 5, the arm 144 on the pivot stud 14 engages the hooked end of the detent lever 141, which latter is held in position for engagement with said arm 144 by contact of its tooth 142 with the periphery of the disk 140. No movement of the arm 144 or turning movement of the paper-carrier can now take place, but as soon as the rock-shaft 116 is turned to bring one of the lines of type on the

roller 90 into position for printing, the tooth 142 will stand opposite one of the notches in the disk 140, permitting said tooth to be drawn by the spring 145 into the said notch, and thereby disengaging the hooked end of said detent 141 from the arm 144 and permitting the pivot stud 14 and paper-carrier to be turned.

In order to hold the fare-printing roller 90 from being turned, and the crank-arm 117 and its attached gear-segment 119 from being shifted at a time when the paper-carrier is being swung or oscillated to effect the printing of a ticket, an automatically acting locking device is provided as follows: As hereinbefore stated, the sleeve 85, through which said roller 90 is turned, is provided with a rigidly attached locking disk 87, located outside of the frame plate 4. Said locking disk is provided with notches in its periphery corresponding in number and spaced to correspond with the lines of type on said roller 90. On the plate 4 is pivoted, by a pivot stud 151, a locking detent 150 provided on one of its arms with a laterally projecting, holding tooth 152 adapted for engagement with the notches in said disk 87. A spring 153 acts on the said detent lever in a direction to draw the tooth 152 into engagement with said locking disk. The opposite arm of said detent lever extends beneath and in the path of the lower edge of the sliding plate 120; the parts being so arranged that when the said plate is at the lower limit of its movement, it presses on said arm of the detent lever in a manner to hold the tooth 152 away from the said locking disk. When, however, the plate 120 is lifted in the operation of the printing devices, the detent arm will be released and its spring 153 will draw the tooth 152 into engagement with one of the notches in said locking disk. It follows that the type roller 90 and the crank-arm 117 will always be locked or held from movement during the movement of the parts in the printing operation, and that movement of said crank-arm 117, to effect the rotative adjustment of the roller 90, can take place only when the paper-carrier is in its retracted position, and the plate 120 is at the lower limit of its movement.

The face of the type-carrier may be furnished, as shown, with type of a permanent character for printing the number of the machine, the name of the company and any other particulars that may be desired.

To enable the roll of paper 17 to be placed upon the spool formed by the circular disks 19, 19 and the tube 18, one of said disks is removable from the said tube. As shown in Fig. 14, one of said disks is permanently attached to one end of said tube and the other disk is provided with a central sleeve 160 adapted to enter and fit within the other

end of the tube. The said tube 18 also has, in its end to which the attached disk is secured, a sleeve 161 of the same size as the sleeve 160, and which is immovably secured in the tube. The sleeves 160 and 161 are closed at their inner ends, and within the same are mounted endwise sliding pivot pins 162, 162 which are pressed yieldingly outward by coiled springs 163, 163 interposed between their inner ends and the closed inner ends of the sleeves. The outer ends of said pivot pins are made conical and adapted to engage bearing recesses formed in the inner faces of the disks 12, 12 of the paper-carrier, at the center of said disks. To guide the said pivot pins to the said bearing recesses, the said disks 12, 12 are provided in their inner faces with radial guide-grooves 164, 164, reaching to the outer margins of said disks. The said spool is held from rotating with the paper-carrier by means of a rod 165 which is attached to and extends between two radial arms that extend outward from the disks 19, 19 (Figs. 3 and 14). The rod 165 is secured to the disk 19 which is fixed to the tube 18 and has its opposite end reduced in diameter to engage an aperture in the removable disk, as seen in Fig. 14. Said rod 165 is, when the spool is inserted between the disks 12, 12 of the paper-carrier, engaged by a detent arm 166 pivotally supported on a cross-rod 167 extending between the side plates 4 and 5 of the machine. The detent arm 166 has a holding tooth 168 having an inclined lower face and forming a shoulder behind which the cross-rod 165 rests. The said detent arm is pressed downwardly to hold its tooth 168 engaged with the said cross-rod, by means of a spring 169. The detent arm 166 is also provided with a latch lever 170 which is pivoted thereto and held by a spring 171 with its lower end, which projects below the detent arm, in engagement with the inner side of the rod 165 so as to hold the latter in contact with the tooth 168 and thereby firmly hold the spool from turning in either direction. The purpose of so holding the spool from rotation is to maintain a constant tension on the strip of paper as it is drawn from the spool, the contact of the roll of paper with the tube 18 and disks 19, 19 producing a sufficient degree of frictional resistance to the turning of the roll on the spool to give the desired tension in the strip.

The spool with the roll of paper thereon is inserted laterally between the disks 12, 12 of the paper-carrier through an opening in the casing 7 of the machine, which opening is closed by a hinged door 172 provided with a locking device 173 by which it is held closed.

The operation of printing and issuing a ticket is as follows: The crank-arm 117 hav-

ing been turned to the position indicating, by means of the indicator plate 130, the rate of fare and stage of the trip, the type-roller 90 will be brought in position for printing the desired characters on the paper-strip. The crank-arm 16, secured to the pivot-stud 14 of the paper-carrier, is now turned in the direction of the arrow in Fig. 2, whereupon the paper-carrier will be turned in the direction indicated by the arrow in Fig. 3 and the strip of paper, the end of which is held between the feed rollers 35 and 36, will be drawn or unwound from the roll and pressed into contact with the type on the carrier 8 by the impression roller 9; the inking roller 10 having meanwhile passed over and inked the type. During the operation of printing the ticket, the segment 55 will move in the direction of the arrow in Fig. 10 and turn the gear-wheel 52 without operating the feed rollers. The sliding plate 120 will move in one direction the crank-arm 112 on the spindle 110 carrying the disks by which are printed the consecutive numbers. When the paper-carrier is near the end of its travel in its advance or printing stroke the arms 26, 26 will engage the lowermost stops 28, 28, and during the continued movement of the carrier, until the stop-shoulders on the disks 12, 12 engage or strike the said stops 28, 28, the spindle of the impression roller will travel along the slots 25, 25 in said arms 26, 26 and the impression roller will be retracted into position to be out of contact with the type in the subsequent return movement of the carrier. The end portion of the strip of paper having been printed, it is issued through the opening 37 in the casing in the backward stroke or return movement of the paper-carrier, effected by moving the crank-arm 16 in the opposite direction. As the paper-carrier approaches the end of its movement in its return or backward stroke, the arms 26, 26 will strike the upper stops 27, 27 and will be moved or shifted backwardly until the stop-shoulders on the disks come into contact with the said upper stop. As the said arms 26, 26 are so shifted or turned relatively to the disks 12, 12, the impression roller will be shifted outwardly by the action of the cam-grooves 25, 25 and thereby brought into position to press the paper against the types in the succeeding forward or printing stroke of the carrier, this being the position of the said impression roller shown in Fig. 3. The segment 55 in its return movement effects the rotation of the feed rollers 35, 36 by means of the gearing described and the pawl 56. The plate 120, in its inward or backward stroke, operates the arm 112 to turn the shaft 110 and thereby turn through one space the units disk of the consecutive numbering disk 111.

It is understood that the machine illustrated may be variously modified in practice, 126

and that I do not desire that my invention should be limited to the details of construction and arrangement shown in the drawings, except so far as the same are pointed out in the appended claims as constituting parts of my invention.

I claim as my invention:—

1. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means, a pivotally mounted, oscillating, manually operable member having geared connection with and turning said type-roller, an endwise movable scale plate, a rack bar arranged parallel with the scale plate and having endwise movement therewith, and a gear segment attached to and turning with said manually operable member and adapted for intermeshing engagement with said rack bar.
2. An apparatus for printing and issuing tickets, comprising an exterior casing or inclosure having a flat top wall, a rotatively adjustable type-roller, impression means, a pivotally mounted, oscillating, manually operable member having geared connection with and turning said type-roller, an endwise movable scale plate located beneath and parallel with the top wall of the casing, a rack bar below and parallel with said scale plate and having endwise movement with the latter, a gear segment attached to and turning with the said manually operable member, and adapted for intermeshing engagement with said rack bar, said top wall being provided with a sight hole through which the scale plate can be observed.
3. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillating member which is given forward and backward movement in the printing of each ticket, a reciprocating plate which is given movement from the said oscillatory member, a secondary plate carried by the first named sliding plate and movable laterally thereon, a scale-plate movable laterally with said secondary plate, and operative connections between said type-roller and said secondary plate, whereby the latter is given lateral shifting movement to correspond with the rotative adjustment of said type-roller.
4. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillating member which is given forward and backward movement in the printing of each ticket, a reciprocating plate which is given movement from the said oscillatory member, a secondary plate carried by the first named plate and movable laterally thereon, a scale-plate movable laterally with said secondary plate and having sliding connection therewith, a guide-rod for said scale-plate, and operative connections between said type-roller and said secondary plate, where-

by the latter is given lateral shifting movement to correspond with the rotative adjustment of said type-roller.

5. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member having forward and backward movement in the printing of each ticket, a main sliding plate which is given reciprocatory movement by the turning of said oscillatory member, a secondary plate carried by and movable laterally upon the main sliding plate, a scale-plate connected and movable laterally with said secondary plate, and a manually operable member which is connected with and gives movement to the rotatively adjustable type-wheel, and which is also connected with and gives lateral shifting movement to said secondary sliding plate.

6. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which is given forward and backward movement in the printing of each ticket, a main sliding plate which is given reciprocatory movement by said oscillating member, a secondary plate carried by and movable laterally upon the main sliding plate, a scale-plate connected and having movement with said secondary plate, a rock-shaft, a manually operable crank-arm attached to said rock-shaft, a gear-segment on said rock shaft, a gear-wheel intermeshing with said gear-segment and having operative connection with said type-roller, a second gear-segment on said rock-shaft, and a rack-bar attached to said secondary plate and adapted for intermeshing engagement with said second gear-segment when the main sliding plate is in its retracted position.

7. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which has forward and backward movement in the printing of each ticket, a main sliding plate, a cam-arm on said oscillatory member adapted to give reciprocatory movement to said sliding plate, a secondary plate carried by and movable transversely on the main sliding plate, a scale-plate connected and having lateral movement with said secondary plate, a swinging crank-arm adapted for manual operation, a gear-segment attached to and turning with said crank-arm, a rack-bar on the secondary plate adapted for intermeshing engagement with said gear-segment when the main sliding plate is in its retracted position, and gearing connecting said manually operable member with said type-roller.

8. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which has forward and

backward movement in the printing of each ticket, a sliding plate, a cam-arm on said oscillatory member giving reciprocatory movement to said sliding plate, a secondary plate carried by and adapted to slide transversely on the said main plate, a manually operable member, a gear-segment connected with and operated by said manually operable member, a rack-bar on the secondary sliding plate adapted for intermeshing engagement with said gear-segment when the main sliding plate is in its retracted position, a laterally movable scale-plate, and a guide-rod on which said scale-plate is mounted, extending transversely of the direction of movement of the main sliding plate, said scale-plate and secondary sliding plate having sliding connection with each other, affording lateral movement of the scale-plate with said secondary sliding plate, while permitting sliding movement of said secondary sliding plate relatively to the scale-plate during the forward and backward movements of said main plate.

9. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which has backward and forward movement in the printing of each ticket, a sliding plate which is given reciprocatory movement by said oscillatory member, a notched locking disk connected and turning with the said type-wheel, and a detent-lever adapted to engage the notched locking disk and to be acted upon by the said sliding plate.

10. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which is turned forward and backward in the printing of each ticket, a main sliding plate, a cam-arm on said oscillatory member adapted to give reciprocatory movement to said plate, a secondary sliding plate carried by and movable laterally on said main sliding plate, a scale-plate connected and moving laterally with said secondary plate, a swinging crank-arm adapted for manual operation, a gear-segment turning with said crank-arm, a rack-bar on the secondary sliding plate adapted for intermeshing engagement with said gear-segment, when the main sliding plate is in its retracted position, gearing connecting said manually operable crank-arm with the said type-roller, and means for locking the rotatively adjustable type-roller from movement during the reciprocatory movement of the main sliding plate.

11. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means embracing an oscillatory member which has backward and forward movement in the printing of each ticket, a manually operable member

which is connected with and gives movement to the type-roller, and locking means for holding said type-roller from turning movement during the operation of said impression means, comprising a rotative, notched, locking disk which turns with said type-roller, a pivoted detent-lever engaging said notched disk, and means operated by the rotative movement of said oscillatory member acting to disengage said detent-lever from said notched disk during the oscillatory movement of said member and to effect the disengagement of said detent-lever from the disk when the oscillatory member is returned to its starting point after the printing operation.

12. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-carrier, impression means including an oscillatory member which is given forward and backward movement in the printing of each ticket, a sliding plate which is given reciprocatory movement through the turning of said oscillatory member, a notched disk connected and turning with said type-roller, and a pivoted detent-lever adapted to engage the notches of said disk and to be disengaged therefrom by the action thereon of said sliding plate, when the latter is returned to its starting position.

13. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including a member which has backward and forward movement in the printing of each ticket, a notched disk connected and turning with the type-roller, and a spring actuated detent adapted to engage one of the notches of said disk when the type-roller is adjusted to one of its printing positions and which is held by the disk in position to hold said member from movement when the said type-roller is not in position for printing.

14. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which has backward and forward movement in the printing of each ticket, a notched disk connected and turning with said type-wheel, an arm rigidly connected and turning with said oscillatory member, and a pivoted, spring-pressed detent provided with a tooth adapted to enter the notches of said disk and with a hooked arm adapted to engage and hold from movement the arm on said oscillatory member except when said tooth is engaged with one of the notches in the said disk.

15. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member which is turned forwardly and backwardly in printing each ticket, a rock-shaft provided with a manually operable crank-arm, gearing connecting

said rock-shaft with said type-roller, embracing a gear-segment on said rock-shaft, a notched disk attached to said rock-shaft, a rigid arm attached to said oscillating member, and a pivoted, spring-pressed detent provided with a tooth adapted to enter the notches in said disk and with a hooked arm adapted to engage and hold from movement the said rigid arm on the oscillatory member.

16. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means including an oscillatory member having forward and backward movement in the printing of each ticket, a main sliding plate, a cam-arm on said oscillatory member giving reciprocatory movement to said sliding plate, a secondary sliding plate carried by and adjustable on said main sliding plate in a direction transverse to the direction of movement of said main sliding plate, a scale-plate connected and having shifting movement with said secondary sliding plate, a manually operable member connected with and giving shifting movement to said secondary sliding plate, an oscillatory, notched disk connected with and moved by said manually operable member, and a spring-pressed detent-lever provided with a tooth adapted to engage the notches of said disk, and with a hook arm adapted to engage the arm on said oscillatory member when the main sliding plate is in its retracted position.

17. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means embracing an oscillatory member which is given backward and forward movement in the printing of each ticket, a main sliding plate, a cam-arm on said oscillatory member adapted to give reciprocatory movement to said main sliding plate, a secondary sliding plate carried by and adjustable laterally on said main sliding plate, a scale-plate connected and having movement with said secondary plate, a swinging crank-arm adapted for manual operation, a gear-segment attached to and turning with said crank-arm, a rack-bar on the secondary sliding plate adapted for intermeshing engagement with said gear-segment when the main sliding plate is in its retracted position, and means for locking said oscillatory member from turning movement except when the type-roller is in one of its printing positions.

18. An apparatus for printing and issuing tickets, comprising a rotatively adjustable type-roller, impression means embracing an oscillatory member which is given backward and forward movement in the printing of each ticket, a manually operable member which is connected with and gives movement to the type-roller, locking means for holding said type-roller from turning movement

during the operation of said impression means, comprising a rotative, notched, locking disk which turns with said type-roller, a pivoted detent-lever engaging said notched disk, and means operated by the rotative movement of said oscillatory member acting to disengage said detent-lever from said notched disk during the oscillatory movement of said member and to effect the disengagement of said detent-lever from the disk when the oscillatory member is returned to its starting point after the printing operation, and means for locking the said oscillatory member from movement except when the type-roller is adjusted to one of its printing positions, comprising a notched disk which is connected and turns with said type-roller, a rigid arm on said oscillatory member, and a spring-actuated detent-lever provided with a tooth adapted for engagement with the notches of said disk and with a hooked arm adapted to engage the arm on the said oscillatory member.

19. A ticket printing and issuing device, embracing a paper-carrier having two rigidly connected side members, a spool for supporting a roll of paper adapted for insertion laterally between said side members, said spool being provided with endwise movable spring-pressed pivot pins, and the side members being provided with bearing recesses for said pins and with guide grooves for the pins extending from the outer margin thereof to said bearing recesses.

20. A ticket printing and issuing device, embracing a paper-carrier having two rigidly connected side members, a spool for a roll of paper adapted for insertion between said side members of the paper-carrier and having rotative connection with the same, and means holding said spool from turning during the oscillating movement of the paper-carrier, embracing a spring-actuated detent-arm provided with a holding tooth, and a spring-actuated locking lever on said detent-arm.

21. A ticket printing and issuing device embracing a paper-carrier having two rigidly connected side members, a spool for supporting a roll of paper adapted for insertion laterally between said side members of the paper-carrier, means rotatively supporting said spool in the paper-carrier, said spool comprising a central tube and two side plates, one of said side plates being attached to one end of the tube, and the other plate being provided with an attached sleeve adapted to enter the other end of said tube.

22. A ticket printing and issuing device, embracing a paper-carrier having two rigidly connected side members provided with bearing recesses in their inner faces and a spool provided with spring-pressed endwise movable pivot pins, said spool consisting of a central tube, and two side plates, one of

which is rigidly connected with one end of said tube and the other of which is provided with a sleeve adapted to enter the outer end of said tube, one of said pivot pins being mounted in said sleeve and the other being mounted in a sleeve which is inserted and secured in the said tube.

23. A ticket printing and issuing device, embracing a segmental type-carrier, an oscillating paper-carrier comprising two rigidly connected side members provided with radial slots, a segmental plate extending between and attached to said side members, an inking roller mounted between said side members, and having a spindle, the ends of which slide in said radial slots, a shield for the inking roller provided with end plates in contact with the spindle of the inking roller, and spring supporting arms for the said shield attached to said segmental plate.

24. A ticket printing and issuing device comprising an oscillating member, an impression roller mounted on the said oscillating member, type-disks for printing consecutive numbers on succeeding tickets, a spindle on which said type-disks are supported, an oscillatory actuating arm for operating said type-disks, a sliding plate, a cam-arm having oscillatory movement with the oscillating member, and acting on said plate to give reciprocatory motion thereto, said plate being connected with and acting on said actuating arm to move the type-disks one unit-space forward in such backward and forward movement of the oscillatory member.

25. A ticket printing and issuing device, embracing a machine-frame, a segmental type-carrier, a paper-carrier having oscillatory movement on an axis concentric with the type-carrier and embracing two side

members between which the roll of paper is carried, said side members being provided with pivot studs which have bearing in said frame, a crank-arm attached to one of said pivot studs, an impression roller mounted on said type-carrier, a rotatively adjustable type-roller, locking means for holding said type-roller from rotation, during the forward and backward movements of said paper-carrier, and means operated by said paper-carrier in its backward movement for releasing said locking means.

26. A ticket printing and issuing device, embracing a machine-frame, a segmental type-carrier, a paper-carrier having oscillatory movement on an axis concentric with the type-carrier and embracing two side members between which the roll of paper is carried, said side members being provided with pivot studs which have bearing in said frame, a crank-arm attached to one of said pivot studs, an impression roller mounted on said paper-carrier, a rotatively adjustable type-roller, and locking means for holding said paper-carrier from rotation, embracing a member which is connected with and given movement by said type-roller, and which acts to effect the locking of the paper-carrier when the type-roller is being turned or shifted, and the release of said paper-carrier when the type-roller is adjusted to one of its printing positions.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 23rd day of February A. D. 1909.

RUFFIN NORTH.

Witnesses:

EUSTACE H. BARKER,
HARRY STEVENS.