To all whom it may concern:

Be it known that I, ARNOLD JAMES TANNER, a citizen of the United States of America, residing at London, England, have invented and useful Improvements in Machines for Stamping and Issuing Tickets, of which the following is a specification.

This invention relates to machines or apparatus of a kind useful for issuing tickets for railway and tramway services also in other instances where applicable, but particularly useful with a prepayment fare collection system for tramway and omnibus services when the fare charged varies according to the distance traveled by the passengers.

The main object of the invention is to provide a simple and efficient apparatus whereby the tickets can be quickly selected, stamped and delivered, and accordingly the apparatus is constructed of two main members, one member being stationary and carries the tickets in as many lots as required. The other member is movable and carries the required number of stamps or printing devices the position of which stamps relatively to the tickets can therefore be changed by operating the movable member. The stamps are capable of being separately actuated for the purpose of printing or impressing the value or other matter on the ticket as it is issued. The stamps may be operated independently or the operation of selecting a ticket is made to actuate the stamp associated with the lot of tickets from the ticket which is to be taken. And also in one of the forms of the improved machine, the stamps are each capable of being turned on its axis so that the position of the type can be varied and thereby print a character or sign on the ticket in different positions.

The invention in several embodiments and various details of construction connected therewith will be hereinafter fully described with reference to the accompanying drawings, in which—

Figure 1 is a plan view of the complete machine in one form; Figs. 1a and 1b show portions of the racks and engaging devices which prevent the movable member from being moved in the wrong direction; Fig. 2 is a sectional view of the complete machine; Figs. 3, 4 and 5 are detail views showing portions and one end of the movable member; Fig. 6 illustrates diagrammatically the relative position of the stamps to the tickets in the two directions in which the car may travel; Fig. 7 is a sectional view illustrating another form of the machine; Fig. 8 is a plan view of the same machine with the movable member shown in the left hand position; Fig. 9 is an end view of the last mentioned form of the machine, part of the movable member being broken away; Fig. 10 is a front elevation also of the same machine; Fig. 11 illustrates in section another form of the machine embodying all the essential features of the invention; Fig. 12 is a front elevation of this latter machine shown partly in section and partly broken away; and Fig. 13 represents a ticket useful in connection with certain forms of the improved machine.

In accordance with the invention the improved apparatus consists of a stationary member or base portion 1 and a carriage 2 which slides on said portion, which latter member is preferably secured to a rail 3, fixed on the car platform. The carriage 2 has mounted thereon stamps 4, the number of these stamps being according to the different values of the tickets, for example four stamps representing 1d. to 4d. are employed with a corresponding lot of tickets provided in strips wound on reels 5. To enable the operator to grasp the selected ticket, a sliding plate 6, normally projecting outwardly, must be pushed inwardly, which movement operates the stamp, associated therewith, for the purpose of printing the required character on the ticket. The aforesaid plate when released returns to its normal or outer position under action of the spring 7 and the printed ticket is then detached or severed from the strip at the orifice 8 in the covered end 9 of the sliding plate 6.

The sliding movement of the carriage 2 is guided in suitable channels 10 provided in a top plate 11 of the base portion 1, and this plate is provided with racks 12 (see Figs. 1a and 1b) on each side having ratchet teeth arranged in opposite directions for the purpose of allowing movement of the carriage in one direction only, which direction is generally that in which the vehicle is traveling.

The sliding carriage 2 is arranged to be moved intermittently into such positions that the stamps 4 are located immediately over the tickets to be stamped and to retain the carriage in its intermediate positions, a locking device or devices 13 are provided.
(see Fig. 3), each locking device consisting of a pin which engages a hole 14 in the said top plate, the arrangement being that when the carriage slides along the pin falls into the said holes, which engagement stops further movement of the carriage until a ring releasing device 15 is grasped to slide the carriage along. The pin 13 carried on a pivoted lever 16, is then raised out of its engaging position and when the pressure on the ring releasing device is relaxed, the spring 17 causes the pin 13 to fall into the next recess as the carriage slides along.

The stamps 4 are in the form of plunger and are capable of being turned so as to alter the position of the type head 18 relatively to the ticket, thereby the character or sign is printed on the ticket in different positions and for the purpose of setting the positions of these stamp heads a shaft 19 having operating knob 30 at one end is rotated and by means of worms 19' on said shaft, or other power transmission devices, all the stamps may be turned simultaneously.

In the case where the number of stamps equals the number of lots of tickets, the movable member or carriage having the stamps mounted thereon, is set at the commencement of a journey so that the 1d. stamp is immediately over the first lot of tickets and the 4d. stamp over the last lot, each lot of tickets then representing a stage of the journey. At the completion of the first stage of the journey, the carriage is moved along one step, then the tickets for the first stage are no longer in use and the 4d. stamp is also blown out of use; the tickets which were previously 4d. then become the 3d. and the 2d. tickets will be the 1d. tickets. The operation is repeated at the end of the next stage until the end of the journey is reached. When the car is reversed to travel in a different direction, at the commencement of this journey, the sliding carriage 2 is removed bodily from the apparatus and reversed, end for end, and then replaced in such a position that the stamps are correctly located relatively to the tickets. The carriage is now capable of moving in an opposite direction to that allowed in the previous setting. The devices for permitting this movement are clearly shown in Figs. 1' and 1"; and consist of the racks 12 provided on the base portion at each side of the carriage. The carriage is provided with one or more spring detents 21 but only on one side thereof, the arrangement being as shown in Fig. 1'. In this instance the movement of the carriage is only permitted in a left handed direction, but when the carriage is reversed the detents 21 engage the teeth on the other side and then as shown in Fig. 1", the travel of the carriage can only be in a right handed direction. The end detent 21 is connected with a registering device 22 so that when the carriage is moved to its extreme end position, this end detent, which has a greater travel than the other detents, moves to its extreme position and operates a counting and registering device, thereby it is possible to indicate the number of times the carriage has been reversed.

The stationary member 1 comprises a bed having vertical walls 23 and these walls serve as partitions to form compartments for the ticket reels, each reel being held in suitable bearings in said walls by means of a spring 24 to permit replacing of the reels.

The ticket passes through an office 25 in a fixed plate 26 located beneath the sliding plate 6, which plate 6 is cut away at 27 to allow the head 18 of the stamp to pass through and print the required matter on the ticket, which printing operation is effected by the downward movement of the forked compression device 28 carried by the sliding plate 6, the arrangement being that when the sliding plate is pushed in, the inclined surfaces of the forked ends of the compression device engage rollers 29 carried at each side of the sleeve 30, which sleeve forms part of the plunger.

The sliding plate 6 is returned to its normal or outer position by means of the spring 7 placed around the stud 7', which stud serves as a stop to limit the outward movement of the plate. In the normal or outer position of the plate, the end of the ticket strip is not exposed being just in line with a cutting edge of the orifice 8 in the finger plate or cover at the outer end of the sliding plate. To seize a ticket the operator must push the plate inwardly to its fullest extent and this operation causes the plunger to move downwardly and print the ticket. The ticket strip remains stationary so that when the covered end of the plate is pushed away from the end of the strip a grip can be obtained on the end of the strip and the operation of the plate 6 releases a spring detent 21 carried on the said plate, the detent being lifted out of a perforation in the ticket strip, which perforation is one of a series of perforations that determine the length of each ticket. There is a tendency of the plate to return to its normal position under the action of the controlling spring, therefore when the operator releases the plate, after having withdrawn the ticket, the plate returns to its normal or outer position and the detent 21 again comes into contact with the strip and when the next perforation is reached the strip is held and the ticket projecting beyond the strip can be severed at the cutting edge provided at the end of the plate, which plate is then in its extreme outer position.

The plunger of each stamp 4 is capable of
turning around in its sleeve 30 thereby the type head can be set so that a character or sign may be printed on the ticket in various positions. The sleeve is pressed downward by the compressor 28 and when this occurs the finger 32 carried by the plunger, engages a ratchet toothed wheel 33 which operates a counting and registering device 36 and thereby the number of operations of the plunger is recorded. A separate registering device is employed for each stamp and by this means a check is kept of the detail amount of the valuation of the tickets stamped with any one of the stamps. Instead of adding the operation of each stamp separately a total adding device of a known kind may be employed and it is to be understood the registering devices are carried under cover such as locked casing 37 of the carriage 2.

With the improved apparatus any number of stamps may be employed and these stamps can be turned simultaneously by means of the shaft 19 and the worm 19, the latter engaging a gear wheel 19 carried on the plunger. The plunger may, however, be turned separately by means of knob 59 secured at the upper extremity thereof. The plunger together with the sleeve 30 moves vertically and the return movement to the raised position is effected by means of the coiled spring 40 placed around the sleeve 30.

The base portion of the apparatus is provided with upwardly extending supports 41 on which the racks 12 are secured and the bottom plate 42 of the sliding carriage is provided with a dove-tail channel 10 which receives correspondingly shaped slides formed at the sides of the racks. The carriage as previously stated moves along the channel 10 and the detents 21 engage the racks as hereinbefore explained; by this means the carriage is also prevented from running too freely. The purpose of providing double and ratchet toothed racks, the teeth being arranged in opposite directions, is to prevent the operator from moving the carriage to and fro and thereby surreptitiously deliver a false ticket in lieu of one for the correct and higher value. The locking devices render it impossible for the operator to move the carriage backward, and if he should take the carriage out entirely and then start again at the commencement, the end detent 21 will have dropped to its fullest extent under action of a spring 48 and then the finger 44 is dropped down and a ratchet wheel 45, connected to counting mechanism, is moved one notch and thereby by each operation of changing the carriage over is registered. It will be understood that when the operator has set the carriage for a journey the carriage must be moved forward the full length and at the end of the travel of the carriage the said registering device is actuated and each count on the register will then represent one journey of the car.

The carriage is held in its intermediate 70 positions as before stated by the stop pin 13, there preferably being two of such pins, one at each end of the carriage, but both pins are on the same side and engage the holes 14 on either of the sides of the supporting plate 11. In this instance the ring 15 will be duplicated and both of the devices will be operated simultaneously when both pins are engaged.

The base portion of the apparatus is provided with end walls which together with a hinged cover 46 inclose the reels of tickets, and the base portion also carries a hinged clamping device 47 which permits the apparatus to be detachably secured to the rail 3.

A single inking ribbon 48 serves for all the stamps and this ribbon is wound on drum 39 and is turned in the usual manner but the delivering drum may be rotated by hand to re-wind the ribbon thereon, the winding drum 90 being rotated to wind the ribbon thereon at each operation of any one of the stamps. The means for operating the winding drum consist of a shaft 49 having mounted thereon toothed wheels 50 which are engaged by fingers 51, the latter being carried by the sliding plate 4 and arranged so that when any one of the said plates is pushed inwardly the wheel 50 then engaged advances one tooth and accordingly through the medium of suitable gearing the ribbon is wound on the drum in a well known manner.

In another form of the improved apparatus the main features of the above described construction are employed, but various modifications are made in the details with the object of providing a simpler and cheaper form of apparatus which for some purposes is equally as efficient as the other construction hereinbefore described. In this embodiment, illustrated in Figs. 7, 8, 9 and 10 of the drawings, the stationary member 1 is composed of a number of units or cases each carrying a ticket reel and each unit has its own sliding plate 6. The units are secured to a back plate 52 which is provided at the ends with clamps 47 for securing the apparatus to the rail 3. A spring detent 31 or checking device is associated with each sliding plate and this detent constantly bears on the ticket strip and engages the perforations in the same and at each engagement the travel of the strip is momentarily checked. Or if desired the form of detent previously described may be employed and this detent would be raised by the operation of the sliding plate 6. The side walls of the ticket units are extended upwardly above the sliding plates and these extensions are cut away to provide...
nel for the carriage. The carriage is provided with the base piece 42 having its sides dove-tailed to fit in the said channel.

Stamps 4 are carried by the carriage as in the previous instance but the plungers are differently constructed for in the present instance they are not capable of turning, their only movement being vertical under control of the spring 40, but these plungers are actuated by a compression device 28 as previously described. Hollow vertical extensions or pillars 55 rising upwardly from the carriage base guide the plunger and incline the controlling spring 40. The pillars 53 at their upper ends support a box 54 containing the counting and recording mechanism as previously described. A pin 55 passes through the plunger, projecting at each end, and passes through elongated slots 55 in the sides of the pillars, and at each end of the pin a roller 29 is carried on the exterior of the pillar and these rollers are engaged by the inclined surfaces of the compressors 28, which is also forked so as to clear the pillar when the sliding plate is pushed inwardly, which operation, as in the previous instance, forces the plunger downwardly to print the required character on the ticket. In the present embodiment the toothed racks are dispensed with and the means for locking the carriage in its intermediate positions consist of recesses or holes 14 on each side of the base plate 42 of the carriage. Detents consisting of spring pins 14 are provided with a head capable of being grasped by the operator or as shown these detent devices may be self-acting. These devices, or only one when the carriage has been moved a certain distance in one direction, engage the holes 14 in the base plate of the carriage and thus lock the carriage in its intermediate positions. The ribbon feeding mechanism and counting and recording devices are arranged and operated practically the same as in the other form of the machine previously described.

Referring now to Figs. 11 and 12 where in a modified form of the apparatus is shown. In this construction the ticket reels are carried at the top of the apparatus and which reels are held in place by spring bearings 24. The strip is constantly engaged by the spring checking device 31 which is provided with a rolling ball 31 at the end so as to prevent the ticket from tearing and also this ball fits closely in the perforation which is for convenience in manufacture preferably round in shape. The ticket strip is fed under the ribbons 48 and a plate 56 covers the ribbons, which plate is provided with an opening through which the bend 18 of the plunger can pass so as to come into contact with the ribbon and ticket. The ticket strip passes through the orifice 6 in the cover 9 at the end of the sliding plate 6, this covered portion being preferably formed by bending over or shaping the end of the plate as illustrated. The ribbon feeding mechanism in this modification comprises ratchet wheels 50 which are engaged by a gravity pawl 58 carried on the sliding plate 6 and in this construction the inkling ribbon is in the form of an endless belt which is caused to travel around the drums 59 supported by brackets 60; these brackets being secured to the base portion. A plate 61 covers the ribbon to prevent dust and dampness from affecting the same. In this present embodiment the printing of the ticket is also effected by the operation of the sliding plate 6 but the mechanism is modified so as to provide a construction which will operate with less friction than the previous one. The operating mechanism consists of a pivoted lever 62 fulcrumed on the shaft 63 extending through the length of the apparatus so that the same shaft serves for a number of such levers. The location of the fulcrum point is in accordance to the throw required for the upper end of the lever which engages the end of the plunger 4.

The lever 62 is provided with two arms offset at 64 and bent inwardly and then again downwardly so that the lower ends of the two arms of the lever are under the ticket reel and pass through slots 65 in the base plate 66 of the base portion 1. The extremities of the said arms pass through the holes 67 in the sliding plate 6, this arrangement uniting the lever and the plate together so that when the latter is pushed inwardly for the purpose of enabling the operator to grasp the end of the ticket strip, the lever 62 is tilted and forces down the plunger which effects the printing of the ticket next to be withdrawn. When the pressure on the said plate is relaxed the spring 7 engaged with the sliding plate returns the latter to its outer or normal position and the lever is brought back to its raised position and the spring 40 lifts the type head 18 out of contact with the ticket strip.

Each operation of any one of the plungers is registered by means of counting mechanism and in this present embodiment the mechanism for operating the registering device consists of a loose collar 68 carried on the plunger 4, the extent of the upward movement of the said collar being limited by the pin 69. A link 70 fixed on the shaft of the counting mechanism is connected to the said collar so that when the plunger is forced downwardly the link makes a partial turn sufficient to register the stroke of the plunger, and as the counting device works on a ratchet, the link is free to return to its upper position under action of the spring 40. In this modification three stamps 4 are shown and each of these stamps is capable of being turned in order that the sign or...
character provided on the printing head can be set in different positions so that the pointer 71, shown on the representation of a ticket in Fig. 13, will point to a particular named stage point. As this ticket is marked there are two main points, “Liverpool street” and “Oxford Circus,” the intermediate stations being the “Bank,” “Chancery Lane” and “Tottenham Court Road.” In one direction of the car, the journey would, for example, commence at “Liverpool street” and the first stop or intermediate station would be the “Bank.” If it is desired to indicate that the passenger boarded the car at the “Bank” the pointers of all the tickets, 1d, 2d, and 3d, as the case may be, would all point to this station, and when the car reaches the next point, “Chancery Lane,” the indicator of all the stamps would be turned to this station. In operation it may, however, be preferable to indicate the point to which the fare is paid and in this case, as represented by the ticket, the passenger would have boarded the car at the intermediate station before “Oxford Circus.” The object of this setting of the stamps at these intermediate stages is to take care of journeys which overlap main stage points thereby a more exact check of the fares can be obtained without the necessity of punching the tickets, which operation of punching necessities further labor and careful attention of the conductor, all tending to delay the handling of passengers, particularly with a prepayment system of fare collection. The particular means by which the stamps are turned in this present construction consists of the bushing 72 having a shoulder 73. Of the wheel 74 turn on the bushing and a depending part 75 secured to the gear wheel is provided with a squared hole to receive the squared end of the plunger 4. By means of this device when the knob 20 is partially turned, the worm on the shaft engaging the gear wheel 74 causes the latter to also partially turn and the depending part 75 secured to the gear wheel in turn causes the plunger and printing head 18 to also partially turn. The movement of the plunger in a vertical direction is not interfered with by this power transmission device. When the carriage is reversed over end for end for a new journey of the car, the position of the plunger and the printing head relative to the tickets is reversed so that the pointer 71 points toward the bottom of the ticket instead of the top as shown, and for this reason the names of the intermediate stations are in duplicate.

Referring to Fig. 6, the most advantageous use of the improved apparatus in connection with prepayment systems of fare collection in which the tickets used bear differentiating characteristics, for example, various colors, red, white, blue, and pink, the fares ranging from 1d. to 4d. Now 4d. is the maximum fare in either direction, therefore checking of these tickets is not required so it is proposed to let the conductor have separate ordinary 4d. tickets. The tickets for the entire journey in one direction would be pink and for the return journey 4d. tickets would be red. By means of the ordinary ticket the working of the improved apparatus is more applicable when the intermediate stage points are considered. For example, a passenger getting just at the commencement of the journey paying a 1d. fare would get a red ticket with a pointer pointing toward the numeral 4, which latter numeral together with others of the kind, are already printed on the tickets. The pointer on the other tickets would also point to No. 4. When the car has reached the first stage represented by the numeral 1, the carriage is pushed forward one notch in the direction in which the car is traveling. Then a passenger paying a 1d. fare would receive a white ticket with the numeral 1 printed thereon, and for a 2d. fare the passenger would receive a blue ticket and for 3d. a pink ticket and on each of which tickets the pointer would point to the numeral 1. When the car reaches point 2 the stamps are all turned so that the pointer indicates the numeral 2 on all the tickets issued and so on up to when the journey is reached. After the first stage the 4d. stamp would no longer be in use, consequently the conductor would make use of the ordinary 4d. tickets. When the next main stage is reached the carriage is again moved forward and the 4d. stamp will then be no longer in use and this change is repeated until the journey ends. On the return journey the carriage is removed from the apparatus and reversed end for end so that the 1d. stamp would be over the pink ticket and the 4d. over the red.

In the embodiment shown in Figs. 11, 12 and 13 only three stamps are employed, and in this example fares 1d. 2d. and 3d. are charged. Further in this particular instance the route may be divided into three blocks, one block representing the distance between the two main stages, and each block is then sub-divided into three divisions making in all thirteen stage points, and for this purpose the turning printing head is employed to indicate the different points. It is a more simple system where there are no intermediate stages, for example the fare for a journey in any portion of the block between the two stage points being a regular fare as usually charged, it is only necessary that one stamp be employed for a system having fare values 1d. 2d. and 3d., for in this case the fixed value of each ticket would be 1d. and as in the previous instance the 3d.
tickets could be ordinary tickets. The stamp would be valued at 2d. and the position of this stamp relatively to any one of the lots of tickets can be changed as required so that the tickets of any one of the three lots could be stamped with the 2d. stamp and thereby the ticket would be surcharged and which surcharging would be checked by the registering device and also by the ticket itself.

1. I claim:—
1. In an apparatus for stamping and issuing tickets, a stationary base containing a plurality of lots of tickets and supporting a sliding carriage having mounted thereon a plurality of separately actutable stamps.
2. An apparatus of the kind described having a base portion arranged to carry a plurality of lots of tickets separately, one or more stamps movably supported on said base portion so as to permit changing of the position of the stamps or stamps relatively to the lots of tickets, and means consisting of a turning type head for each stamp whereby any stamp can be set to print a character or sign in different positions on a ticket.
3. An apparatus for stamping and issuing tickets, a stationary base containing a plurality of lots of tickets and supporting a sliding carriage having mounted thereon a plurality of separately actutable stamps and a member so associated with each lot of tickets that such member must be operated to issue a ticket and which operation of said member actuates the stamp associated with the respective lot of tickets.
4. In an apparatus of the kind described, a stationary base portion carrying a plurality of reels of tickets, a sliding plate provided for each reel, a plurality of separately actutable stamps mounted on a carriage capable of being moved intermittently on said base portion thereby permitting the position of said stamps to be changed relatively to the ticket reels and which stamps are associated with the sliding plates so that upon the operation of a selected plate the stamp associated with that plate is actuated to print the selected ticket.
5. An apparatus for stamping and issuing tickets having a base portion arranged to carry a plurality of lots of tickets separately and supporting a movable member carrying one or more stamps, a self-acting checking device whereby the movable member is prevented from traveling in a reverse direction without being re-set, and a device for counting and registering each setting of the movable member.
6. In an apparatus for stamping and issuing tickets, a stationary base containing a plurality of lots of tickets and supporting a sliding carriage having mounted thereon a plurality of separately actutable stamps and each stamp having a vertically moving plunger operated by means of a sliding plate provided with each lot of tickets.
7. In an apparatus for stamping and issuing tickets, a stationary base containing a plurality of lots of tickets, and supporting a sliding carriage having mounted thereon a plurality of separately actutable stamps, each stamp having a vertically moving plunger and a device connected with the plunger for counting and registering each operation thereof.
8. An apparatus of the kind described having a base portion arranged to carry a plurality of lots of tickets separately, one or more stamps movably supported on said base portion so as to permit changing of the position of the stamp or stamps relatively to the lots of tickets, each stamp having a vertically moving plunger capable of being turned on its vertical axis, and power transmission means whereby the position of the type heads of all the plungers can be turned simultaneously.
9. An apparatus for stamping and issuing tickets having a base portion arranged to carry a plurality of lots of tickets separately and supporting a movable member carrying one or more stamps, each stamp having a plunger capable of moving vertically and carrying a type head at the lower end thereof, a single inking ribbon provided for the stamp or stamps, a sliding member associated with each stamp and means whereby the operation of any one of the sliding members to seize a ticket actuates the plunger associated therewith to print a ticket and effects the feeding of the inking ribbon.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARNOLD JAMES TANNER.

Witnesses:
LEONARD S. POCOCK,
ROY KING.