Nov. 3, 1953 C. F. WEBB 2,657,750

TICKET STORAGE AND ISSUING EQUIPMENT

Filed July 16, 1948

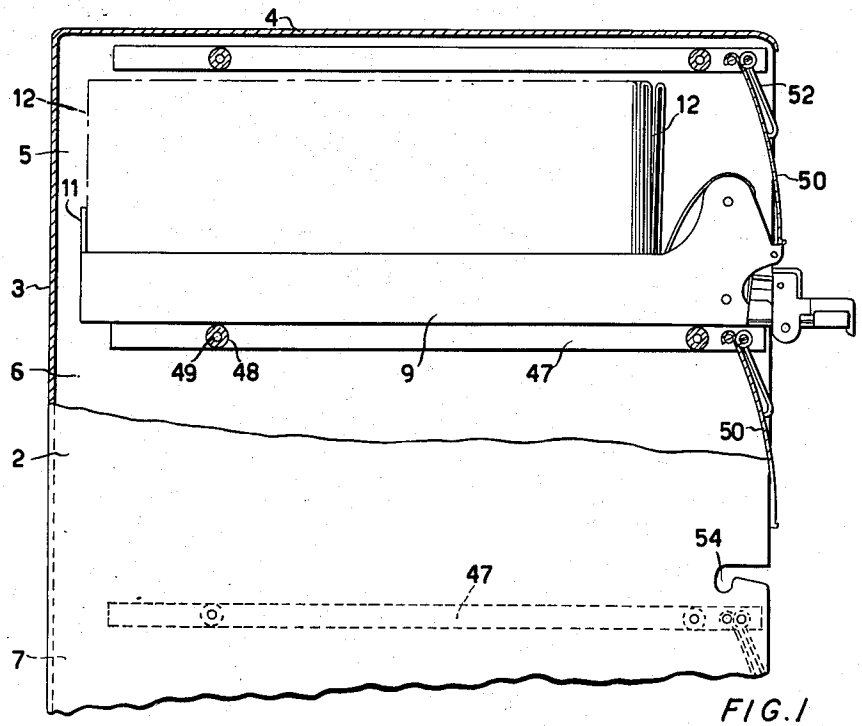

FIG. 1

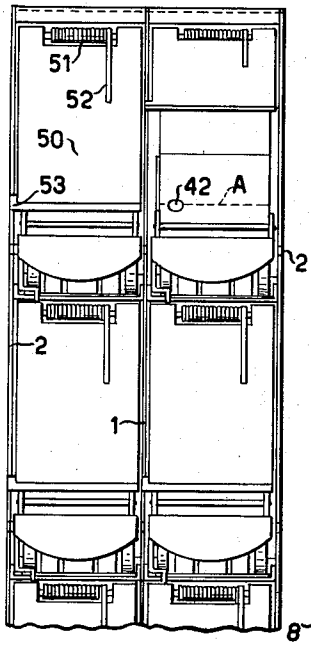

FIG. 2

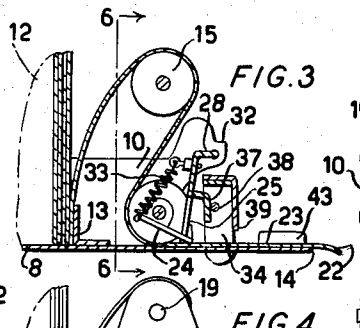

FIG. 3

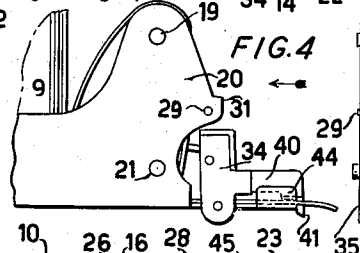

FIG. 4

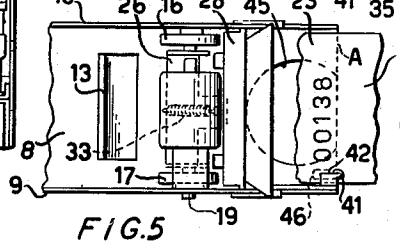

FIG. 5

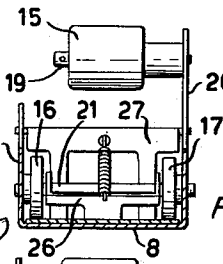

FIG. 6

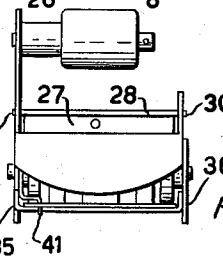

FIG. 7

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TICKET STORAGE AND ISSUING EQUIPMENT

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6 Claims. (Cl. 164—84.5)

1

This invention relates to hand operated machines for storing and issuing preprinted tear-off tickets, using a supply thereof in the form of a continuous strip.

An object of the invention is to provide an improved construction for such machines, applicable equally to "single denomination" machine in which tickets of one denomination (in respect of destination, price, travel class, etc.) only are stored and issued and "plural denomination" machines in which tickets of a number of denominations are stored and issued, which will be marked by simplicity and fewness of working parts and ease, speed and certainty of operation as compared with machines at present in use, for example, machines in which the ticket-forming strip is fed to the tear-off point by a feed wheel engaging the strip by pins on its periphery co-operating with spaced holes in the strip.

More particularly, however, the invention aims to provide an improved ticket storing and issuing equipment for use in railway and like booking offices, where as is known provision has to be made for storing and issuing tickets of a large number of different denominations and in respect of each denomination a large number of tickets.

Heretofore in such equipment it has been the practice to use preprinted tickets and to store these in groups according to their denominations, in vertical ticket racks arranged in convenient positions around the space occupied by the booking clerk. This practice has many drawbacks, among which are, that the ticket racks have to be of relatively large superficial area as regards the collective forwardly presented face of the racks; that it is a relatively easy matter to misplace a ticket in a rack or deliberately to extract one therefrom, with resulting interference in either case with accurate continuity in the serial numbers of the tickets as issued from the equipment; and that as the tickets are largely exposed through the open front of the rack they tend to become soiled with dust and the like from the atmosphere.

As applied to an equipment for use in railway and like booking offices, the improved machine according to the present invention avoids these and other drawbacks with the known forms in a simple and effectual manner and provides an equipment which has a much larger storage capacity than the known ticket rack systems, is so constructed as to make it impossible to misplace or extract a ticket and is also so constructed as to afford a high measure of protection for the

2

tickets stored in the machine against dust and the like from the atmosphere.

According to the broadest aspect of the invention, a hand-operated machine for storing and issuing preprinted tear-off tickets comprises a magazine to hold a supply of such tickets in continuous zig-zag or roll strip form, from which supply the tickets are drawn, by manual effort applied directly to the ticket in course of being issued, to a tear-off point at the exterior of the machine, whereat, upon a ticket having been torn off, the leading end of the next following ticket is exposed so as to be accessible for manipulation in the next following operation of the machine, and a manually releasable means for automatically locking said following ticket against further movement in the direction past the tear-off point during the tearing off of the ticket in course of being issued and thereafter until said next following operation of the machine.

Further, according to the invention, a hand-operated machine for storing and issuing preprinted tear-off tickets of a number of different denominations, for example, such a machine for use in railway and like booking offices, comprises a plurality of complete storing and issuing units allocated respectively to the several denominations and each consisting of a magazine and a manually releasable means as recited above, the several units being preferably housed collectively in an enclosing casing therefor upon the interior structure of which they are respectively supported.

Further according to the invention, the manually releasable means is preferably arranged to lock the ticket also against movement in the direction away from the tear-off point.

The form of the manually releasable means may vary widely. According to a preferred form of the invention, however, the manually releasable means locks the ticket by pressing it against a fixed surface in its path in rear of the tear-off point, for example, as in the particular embodiment of the invention, hereinafter described, by means of a sprag mechanism spring loaded in the direction to move the parts of the mechanism to the effective (ticket-locked) position.

Further according to the invention, the manually releasable means may be arranged to be released by actuation of a release member which is so positioned as to be capable of being manipulated by the thumb and finger of the hand by which in the operation of the machine the ticket to be issued is pulled to the tear-off position.

Preferably, again as in the particular embodi-

ment of the invention hereinafter described, the magazine and the manually releasable means form together a self-contained unit which as such and with the supply of tickets in position in the magazine, is insertable into and withdrawable from position in the machine.

Further according to the invention, the magazine of such self-contained unit may be formed as an open tray adapted to accommodate the supply of tickets snugly between the side walls thereof.

The invention will now be further described with reference to the accompanying drawings, which illustrate a preferred constructional form of the invention as applied to an equipment for use in railway and like booking offices, replacing the present ticket rack systems in use therein.

In these drawings:

Figure 1 is a fragmentary side elevation of the upper part of a section of the machine with certain parts broken away to show the construction;

Figure 2 is a fragmentary front elevation of the equipment showing the upper of two adjacent sections thereof;

Figure 3 is a fragmentary longitudinal section through one of the units of the machine, at the front thereof;

Figure 4 is a fragmentary side elevation of one of the units at the front thereof;

Figure 5 is a corresponding plan view to Figures 3 and 4;

Figure 6 is a section through Figure 3 on the section line 6—6 thereof, looking in the direction towards the front of the unit; and

Figure 7 is an end view of a unit, looking in the direction of the arrow in Figure 4.

Like reference numerals indicate like parts in the various figures of the drawings.

The complete equipment would comprise a number of vertical sections as shown in Figure 1 disposed, for example, side by side. There may be any number of such sections, according to the required storage capacity of the equipment, either in respect of the number of ticket denominations to be accommodated or in respect of number of tickets to be stored per denomination, or in respect of both of these factors regard being had, of course, to the number of denominations accommodated per section. In a similar way, the number of denominations accommodated per section, which is equal to the number of self-contained units as hereinbefore referred to therein, may be varied by varying the over-all height of the section, the arrangement in mind being one in which all of the units of the equipment are of the same design, construction and dimensions so as to be mutually interchangeable with one another as regards position in the machine. Conveniently, in the case of an equipment for a railway booking office, there may be four or five units in the section, each unit being designed to hold when the magazine of the unit is full, a supply of said 500 tickets of the standard railway width, in which case a capacity of the equipment of nearly 18,000 tickets per square foot of wall area occupied by the equipment, or more than five times the capacity of the conventional ticket racks of an equal area, is readily obtainable with the improved equipment of the invention.

The particular construction illustrated in Figure 2 is one in which the sections are incorporated together in a single casing, which for this purpose is divided interiorly by one or more vertical partitions according to the number of sections to be embodied in the casing. If desired, however, each section may be a separate entity from the casing or casings adjacent to it in the equipment. Actually, the arrangement shown in Figure 2 is one in which there are two sections in the casing, which therefore comprises a single partition 1 and two side walls 2, 2.

At the rear of the casing there is or may be a rear wall 3 and at the top an upper wall 4 so providing a casing which is closed by wall members on all sides except at the front.

The wall members of the casing are composed of sheet metal and the interior space of each section of the casing is divided vertically of the casing into, say four or five spaces 5, 6, 7, etc., in each of which is a self-contained ticket storing and issuing unit as hereinbefore referred to.

As already remarked, all of the units of the machine are of identical design, construction and dimensions. Consequently, it will suffice to describe only one of them in what follows.

As shown, a unit comprises a magazine for the supply of tickets, in the form of an open tray having a bottom wall 8, two side walls 9, 10 and a rear wall 11, the supply of tickets, which is of the zig-zag continuous strip form and is marked 12, being accommodated in the tray between the rear wall 11 thereof and an upstanding flange 13 near the forward end of the tray. The width of the tray is slightly greater than the width of the tickets, with the result that the supply 12 thereof fit snugly between the side walls 9, 10 of the tray.

At the front end the bottom wall 8 of the tray is prolonged beyond the flange 13 so as to project beyond the line in profile at the front of the casing, as shown clearly in Figure 1. The forward end edge 14 of the bottom wall 8 provides the "tear-off" point of the unit, as hereinbefore referred to, along which the tickets are torn off after having been brought to the tear-off position.

A ticket forming strip is drawn from the supply 12 thereof in rear of the flange 13 to the tear-off position, at which it is torn off along a score line, A, formed in the ticket, over an upper guide roller 15, under two lower guide rollers 16, 17 and then forward to the tearing-off position. When the strip is at the tear-off position the score line A is coincident with (i. e., vertically above) the forward edge 14 of the bottom wall 8 of the tray, which forward edge, therefore, constitutes the "tear-off" point aforesaid of the unit.

The upper roller 15 is freely revoluble on a fixed spindle 19 which, as shown, overhangs the part of the mechanism of the unit below, from an upstanding lug 20 integral with the side wall 10 of the tray, the spindle being carried by this lug. The lower rollers 16, 17 are freely revoluble on a fixed spindle 21 affixed at the two ends thereof to the side walls 8, 9 of the tray, the end of the spindle at the side of the tray whereat the lug 20 is situated projecting a short distance from the wall 9 for a purpose hereinafter set forth.

The strip having been drawn to the tear-off position, the ticket in course of being issued, which is marked 22, the next following ticket being marked 23, is torn off along the score line A as already described and while it is being torn off, the said next following ticket 23 is locked against movement in either direction, towards the tear-off point (edge 14) or away from it, by a double-acting sprag mechanism as hereinbefore referred to, which also maintains its action upon the strip during the intervals between successive operations of the unit.

This sprag mechanism comprises a forwardly directed sprag 24 which operates to prevent rearward movement of the ticket and a rearwardly directed sprag 25 which operates to prevent forward movement of the ticket. During movement of the ticket forming strip to the tear-off position the sprag 25 is in a released (disengaged) position in which its effective edge is raised clear of the face of the strip and the sprag 24, being forwardly directed, allows the strip to move past it substantially unrestrained. It will be understood of course, that the sprags operate by pressing the strip against the upwardly presented face of the bottom wall 8 of the tray.

The sprag 24 is constituted by a single centrally disposed leg portion of a U-shaped stirrup 26 mounted for free pivotal movement upon the spindle 21 between the two guide rollers 16, 17 thereon.

The sprag 25 is constituted by downwardly directed leg portions of a bent plate of which the upper part in the plane of the leg portions is marked 27 and the portion bent out of said plane (see Figure 3) is marked 28. The part 28 is formed at the two lateral extremities thereof with pivots 29, 30 by which the plate is pivotally mounted upon a pair of lugs 31, 32 formed upon the side walls 9, 10 of the tray at the forward end thereof, the pivots 29, 30 being received in holes in the lugs in the manner shown.

The sprags are yieldingly coupled in such a manner as normally to maintain them in effective position in relation to the strip, by a tension spring 33 anchored at one end to the stirrup incorporating the sprag 24 at a point thereon so situated as to bring the line of the spring to a position in rear of the spindle 21 and at the other end to an eye projecting rearwardly from the aforesaid upper part of the bent plate incorporating the two legs that form the sprag 25.

The sprag mechanism is released, to free the ticket to be issued, namely the ticket 23, by a manually operable release device.

This device comprises an inverted U-shaped stirrup 34 pivoted at the lower end of the side limbs thereof, by pivots 35, 36 projecting laterally from the edges of the bottom wall 8 of the tray into holes provided to receive them in the said side limbs, to said bottom wall so as to have a freedom for angular movement in a vertical plane towards and away from a tongue 37 on the bent plate carrying the elements of the sprag 25, said tongue being formed by a portion of said plate bent forwardly from the general plane of the plate and then downwardly as shown in Figure 3.

Extending across the space between the two side limbs of the stirrup 34 and affixed at the ends to said side limbs is a rod 38 and when the unit is at rest, in readiness for the next ticket issuing operation, with the sprag mechanism in the effective (ticket-locked) condition, the rod 38 is just clear of the tongue 37.

Mounted upon the stirrup 34 is a pressure plate 39, the forwardly presented portion of which is so positioned relatively to the leading edge of the ticket (23) in readiness to be issued in the next operation of the unit, as to be accessible to the thumb or a finger of the same hand as that by which the ticket (23) is pulled to the tear-off position, the manipulation of the pressure plate 39, which is thereby moved in the rearward direction with consequent movement of the sprag 25 to the released position, being performed by pressure from said thumb or finger applied during the commencement of withdrawing movement of the ticket towards the tear-off position, which withdrawing movement is performed by pulling upon the leading edge of the ticket.

Projecting forwardly from the side limbs of the stirrup 34 is an arm 40 carrying at the free (forward) end thereof a downwardly directed finger 41. This finger constitutes a "feeler" and it is lifted and lowered respectively as the stirrup is moved about its pivots.

When the unit is at rest, with a ticket (23) in position in readiness to be issued, the finger 41 protrudes through what is virtually a notch 42 in the leading edge of the said ticket, said notch being constituted by one half of a perforation in the strip, positioned on the score line (A) thereof, which perforation is one of a series thereof formed in the strip at ticket-length intervals therealong, and the arrangement is such that with the finger in this position, the rod 38 is clear of the tongue 37 so as to relieve the sprag 25 from all pressure from the stirrup 34 such as would tend to move it away from the effective (ticket-locked) position. The arrangement is further such that when the pressure plate 39 is pressed back in the manner above described the finger 41 is raised clear of the path of the ticket in course of being issued so as to permit the ticket to be pulled out to the tear-off position. The pressure plate having thus been pressed back and the pulling out of the ticket having been commenced, to the extent of bringing the portion of the ticket in rear of the notch 42 under the point of the finger 41, the pressure upon the pressure plate can be removed, as although the finger will then return towards the lowered (ticket-locked) position, it will be prevented from actually reaching that position, so as to lock the strip against forward movement, by the intervention between it and the wall 8 of the tray of said portion of the ticket in course of being issued. The ticket, therefore, remains free (unlocked) until such time as the tear-off position is reached, whereupon the next aperture in the strip comes under the feeler so as to allow the latter to complete its return movement to the lowered position, with consequential return of the sprag mechanism also to the effective (ticket-locked) condition. The strip is now relocked in readiness for the tearing off of the ticket in course of being issued and in this condition it remains until the next ticket issuing operation of the unit.

At the end of the lateral edges of the bottom wall 8 of the tray, abreast of the portion of the wall adjacent the tear-off edge 14 are a pair of upstanding lugs 43, 44. These provide abutments against which in the tearing off of a ticket the lateral edge of the next following ticket may abut so as by being held against lateral displacement to assist in the tearing off operation.

To assist in getting hold of the leading edge of the ticket (23) at the commencement of a ticket issuing operation, a notch 45 is provided in the bottom wall 8 of the tray, leading from the tear-off edge 14, and to accommodate the movement of the feeler (finger 41) a small notch 46 is also provided in said bottom wall, adjacent the notch 45.

In loading the unit with its supply of tickets the leading end of the strip is first threaded under the guide rollers 16, 17 and thence past the sprags 24, 25 (the sprag 25 being, by manual pressure upon the pressure plate 39, in the ineffective position) to a position in which its leading edge is coincident with the tear-off edge 14. The sprag mechanism is then allowed to reas-

sume the effective condition, whereupon the said leading end of the strip, as regards the portion thereof in rear of the lower guide rollers 16, 17 is manipulated into position over the upper guide roller 15, by way of the space between the outer (overhanging) end of the roller 15 and the lower roller 16.

Conveniently, in the use of this unit, a fresh supply of tickets may be attached to the tail end of the supply already in the unit, prior to issuance of the last ticket of that supply, the leading end of the first ticket of the fresh supply being attached to the trailing end of the last ticket of the supply already in the unit, for example, by a gummed tab, which can be supplied with the zig-zag pack. Also provision may be made for automatically indicating when the time has come to insert a fresh supply, for example, the last 100 or so tickets may be marked with a colored line or other marking for this purpose.

Each unit is slidably mounted in the casing upon a centrally disposed rail 47 and cross tubes 48 threaded onto rods 49 extending across the interior spaces of the casing from side wall to side wall thereof and therefore through the partition (or partitions) in the particular construction illustrated, the unit being slidable to and from position in the casing by the front thereof, which for the purpose is devoid of a wall member although normally closed by a series of flaps 50 disposed one opposite each interior unit-occupied space (5, 6, 7, etc.) of the casing.

These flaps serve three purposes. Firstly, they serve to close the said spaces 5, 6, 7, etc., thereby insuring against access of dust and the like to the tickets in the units from the external atmosphere. Secondly, by lying along their lower edges, immediately above the upwardly presented edges of the lugs 31, 32 on the side walls of the trays of the respective units, they serve to lock the units at the front end thereof against upward displacement from normal position in the casing. Thirdly, they provide in the case of each flap a surface upon which may be written or otherwise marked, or carried, identification data relative to the tickets in the unit behind the flap.

The flaps are maintained in the normal position by retaining springs 51 having lever arms 52 which communicate the tension of the spring to the flap and serve also as a clip to hold against the face of the flap say a loose ticket. The flaps are located in the normal position by laterally projecting lugs 53 on the edge of the flap so positioned as to be capable of engaging the forwardly presented edge of the side wall (2) or partition (1) of the casing at the side of the flap at which the lug is disposed thereon.

When a unit is in normal position in the casing the projecting end of the spindle 21 occupies a position at the bottom of an inverted L-shaped notch 54 in the side wall 2 or partition 1 of the casing, in which it is effective to lock the unit against forward (withdrawal) movement relatively to the casing. As shown, the lower edge of the horizontal portion of the notch 54 slopes downwardly and curves smoothly into the general line of the edge of the wall or partition. This enables the said projecting end of the spindle 21 to slide automatically into position in the notch as the unit is pushed home in the operation of inserting a unit. To withdraw a unit, the latter is lifted slightly and then drawn forwardly, with the corresponding flap 50 held in a raised position.

When a ticket (23) is in issuing position in that unit, its serial number is plainly visible just in rear of the score line A, as appears from Figure 5.

Obviously, many modifications as regards structural details are possible. For example, the details of the locking means for the ticket-forming strip may be different from those employed in the particular construction described, as also may the details of the release mechanism for these means. Or the form of the magazine element of the self-contained unit may be different from that used in said particular construction, although it may be remarked that that form has numerous advantages, for example affords great facility for the operation of loading the unit with tickets and gives a construction which is light in weight and also inexpensive to manufacture, for which reasons it is a generally preferred construction to employ in carrying the invention into effect.

It will be understood that a "single denomination" machine in accordance with this invention would differ from a "plural denomination" machine simply in that it comprises one ticket storing and issuing unit only, which could either be a self-contained unit insertable into and withdrawable as such from an enclosing casing, or a unit built into the casing.

In the case of a construction employing a ticket supply in roll form the general design, arrangement and manner of operation of the machine would be the same as for a machine using a supply of the zig-zag form, except that the magazine would be designed to take a roll, which would rest loosely on the bottom wall of the magazine, instead of a zig-zag pack. Generally speaking, however, it is preferable, especially for equipment for use in railway and like booking offices, to employ ticket supplies of the zig-zag form, or with such form the necessary vertical height of the magazine to hold the supplies can be reduced to a figure only a little greater than the length of the tickets to be issued, as in the particular embodiments of the invention hereinbefore described and shown in the drawings, whereas with a supply in roll form the necessary vertical height of the magazine to accommodate the roll (assuming a roll containing the same number of tickets as the zig-zag pack) would be very considerably greater than the length of a ticket.

What I claim and desire to protect by Letters Patent is:

1. A ticket storage and issuing machine comprising a ticket strip storage compartment, a tear-off edge exposing the leading edge of the next ticket for withdrawal, clamping means normally engaging the ticket strip and preventing withdrawal of the strip from the storage compartment, clamping means preventing retrograde motion of the strip, manually operated means for releasing the first mentioned clamping means from engagement with the strip to permit withdrawal of the strip, and indexing means engaging the strip and responsive to voids in the strip for rendering the releasing means inoperative, the arrangement being such that the first mentioned clamping means is disengaged from the strip upon manual operation of the releasing means and acts to engage the strip upon operation of the indexing means in response to voids in the strip.

2. In combination, ticket strip storing and issuing magazines each comprising a ticket strip storage compartment, a tear-off edge exposing

the leading edge of the next ticket for withdrawal, clamping means normally engaging the ticket strip and preventing withdrawal of the strip from the storage compartment, clamping means preventing retrograde motion of the strip, manually operated means for releasing the first mentioned clamping means from engagement with the strip to permit withdrawal of the strip, and indexing means engaging the strip and responsive to voids in the strip for rendering the releasing means inoperative, the arrangement being such that the first mentioned clamping means is disengaged from the strip upon manual operation of the releasing means and acts to engage the strip upon operation of the indexing means in response to voids in the strip; and a compartmented casing into which said magazines are inserted.

3. A ticket storage and issuing machine comprising a ticket strip storage compartment, clamping means normally bearing against the ticket strip and holding the strip to prevent forward motion of the strip, indexing means engaging the ticket strip and responsive to voids in the ticket strip, the indexing means holding the clamping means from the strip during withdrawal of the ticket strip and releasing the clamping means upon completion of withdrawal of a ticket, thereby properly positioning the ticket strip during tear-off of withdrawn tickets.

4. In combination, ticket storage and issuing magazines each comprising a ticket strip storage compartment, clamping means normally bearing against the ticket strip and holding the strip to prevent forward motion of the strip, indexing means engaging the ticket strip and responsive to voids in the ticket strip, the indexing means holding the clamping means from the strip during withdrawal of the ticket strip and releasing the clamping means upon completion of withdrawal of a ticket, thereby properly positioning the ticket strip during tear-off of withdrawn tickets; and a compartmented casing collectively housing said magazines.

5. A ticket storage and issuing machine comprising a ticket strip storage compartment, means normally clamping the ticket strip and preventing withdrawal of the strip from the storage compartment, indexing means engaging the strip and responsive to voids in the strip, and means manually actuated for disengaging said clamping means from the strip to permit withdrawal of the strip, said indexing means acting to hold said clamping means disengaged from the strip during withdrawal of a portion of the strip and acting in response to a void in the strip to release the clamping means to permit the clamping means to engage and clamp the strip and arrest withdrawal thereof.

6. In combination, ticket strip storing and issuing magazines each comprising a ticket strip storage compartment, means normally clamping the ticket strip and preventing withdrawal of the strip from the storage compartment, indexing means engaging the strip and responsive to voids in the strip, and means manually actuated for disengaging said clamping means from the strip to permit withdrawal of the strip, said indexing means acting to hold said clamping means disengaged from the strip during withdrawal of a portion of the strip and acting in response to a void in the strip to release the clamping means to permit the clamping means to engage and clamp the strip and arrest withdrawal thereof; and a compartmented casing into which said magazines are inserted.

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