Oct. 31, 1944. R. H. HELSEL 2,361,626

TICKET ISSUING MACHINE

Filed Feb. 8, 1940 2 Sheets-Sheet 1

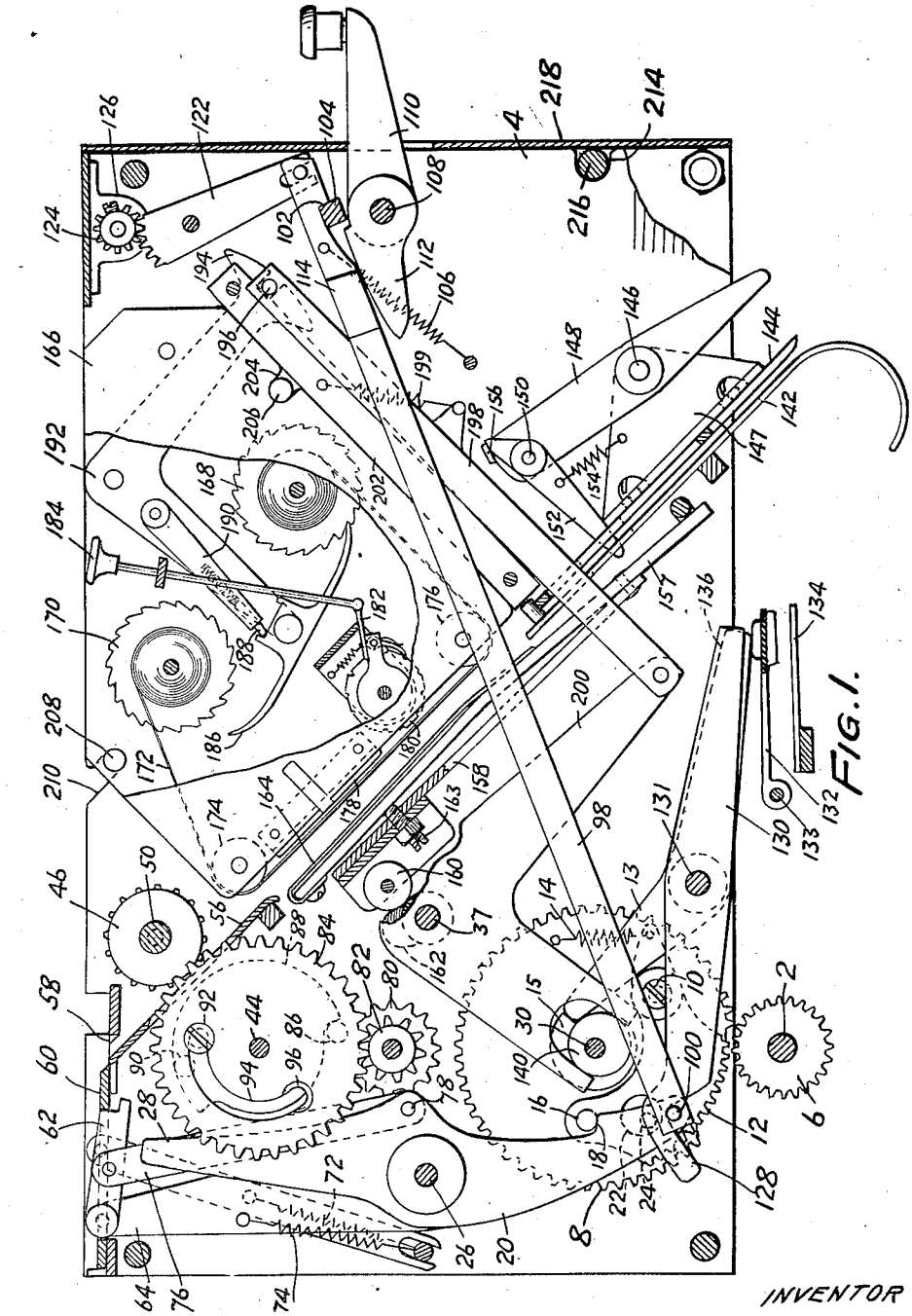


FIG. 1.

WITNESS:
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TICKET ISSUING MACHINE

Filed Feb. 8, 1940 2 Sheets-Sheet 2

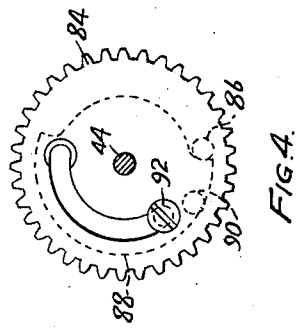


FIG. 4.

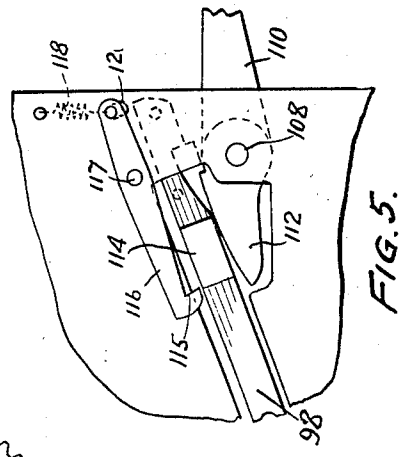


FIG. 5.

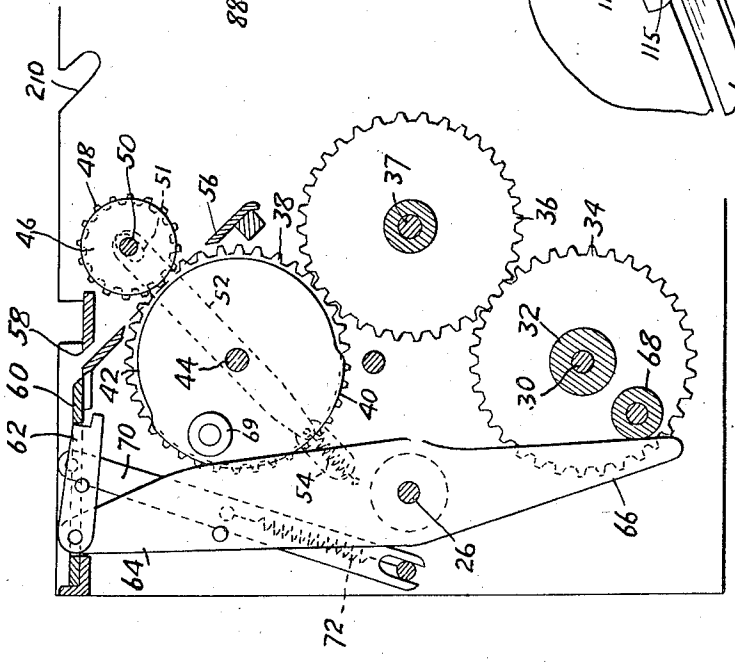


FIG. 3.

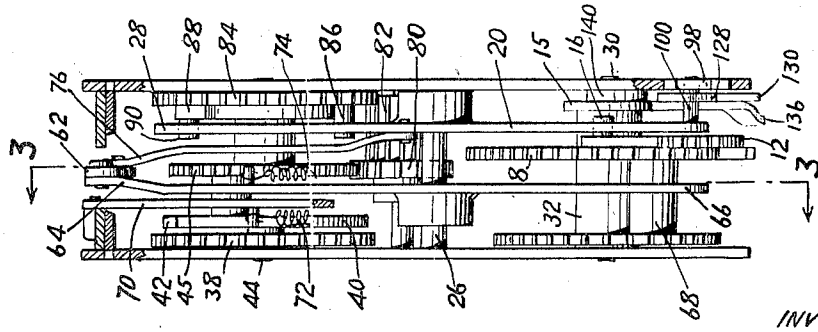


FIG. 2.

INVENTOR

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Patented Oct. 31, 1944

2,361,626

UNITED STATES PATENT OFFICE

2,361,626

TICKET ISSUING MACHINE

Reuben H. Helsel, Long Island City, N. Y., assignor to General Register Corporation, New York, N. Y., a corporation of Pennsylvania

Application February 8, 1940, Serial No. 317,819

5 Claims. (Cl. 101—69)

This invention relates to a ticket issuing machine, and more particularly to a machine adapted to print and issue tickets.

Pre-printed tickets have a value which some times makes it undesirable to keep such tickets on hand either when circumstances are such that their theft or loss is possible or when their value may be so high and their voiding such as to cause so much trouble that it is undesirable to run any risk of their being stolen. Such conditions may be avoided by the provision of machines to print tickets in whole or in part as they are issued, and for this purpose various machines have been designed. The appearance of the ticket must often be taken into consideration, however, and in general it is difficult to print in a ticket issuing machine tickets comparable in appearance with those printed in strips by apparatus devoted solely to the printing operation.

It is sometimes desirable, particularly when both printing and issuing itckets, that tickets issued by a machine should be either of a certain predetermined length or double that length, the latter condition arising, for example, in the case of railroad return tickets, rain checks or the like.

It is a broad object of the present invention to provide a ticket printing and issuing machine in which printing of good quality can be accomplished so that the machine may be acceptable for printing, for example, railroad tickets. A further object of the invention is the provision of a machine which, by a quite simple adjustment, which may be effected by any ordinary user of the machine, will serve to cause it to issue either a single or double length ticket, the arrangement being such that, after an adjustment is made, that adjustment may be inaccessible to the operator of the machine.

As will be evident hereafter, the machine of the present invention may be either key or coin operated. In case it is key operated, it is preferably provided with means to prevent the issue of more than one single or double length ticket if the key is held down.

Further objects of the invention relating to details, for example, the arrangement of means for carrying and effecting the feed of an inking ribbon, and means for causing a knife to operate but once in a cycle of operation, irrespective of the issue of a single or double length ticket, will be apparent from the following description, read in conjunction with the accompanying drawings, in which:

Figure 1 is a vertical section through a unit of the machine taken inside a left hand cover plate thereof;

Figure 2 is a rear elevation of said unit;

Figure 3 is a vertical section through the rear portion of said unit taken on the plane indicated at 3—3 in Figure 2;

Figure 4 is a fragmentary section showing particularly the adjustment necessary to convert the machine to issue selectively single or double length tickets; and

Figure 5 is a fragmentary view showing means for preventing multiple operation in the event the operating key is held down.

The machine illustrated in the drawings is shown as adapted for key operation though, as will be evident, it may be coin operated. The drawings show a single unit which, as is customary, is adapted to be received, along with other units, in a suitable housing, and to discharge its tickets through a suitable opening in a cover plate of the housing. In the case of assembly of units of this nature, it is customary to provide for driving them by a single motor, and for this purpose there is provided in the present instance a transverse shaft 2 extending below all of the units within the housing and geared to be driven by a motor, which is not shown. This type of drive for a plurality of units is quite conventional, and need not be further described.

Beneath each of the units of the set the shaft 2 carries a pinion 6. Above this pinion and arranged to mesh with it in each of the units is a gear 8, which is multilated to the extent of removal of teeth from a small section of its circumference. Pivoted at 10 on this gear 8 is a toothed segment 12, normally urged in a counterclockwise direction, as viewed in Figure 1, by a spring 14. When the unit is in its raised position, as illustrated in that figure, a pin 16, carried by the segment 12, is engaged with a shoulder 18 on a lever 20, so that the segment is drawn inwardly with its teeth clearing the pinion 6 inside the circle of the other teeth of gear 8. When the pin 16 is released, however, as later described, the spring 14 will swing the segment 12 to a position limited by engagement of a pin 24 carried by the gear 8 with the side of an opening 22 in the segment. When this position is attained the teeth of segment 12 supplement the teeth of the gear 8 to provide a complete set of teeth so that the gear 8 and the parts which it carries serve as a complete gear to be driven by the pinion 6. When this occurs, the shaft 2 will be driven and the rotation of the gear 8 serves to operate the machine.

In its rest position, the gear 8 is locked against reverse rotation by engagement of the shoulder of cam 15 carried by the gear 8 with an upwardly extending arm 13 of a switch controlling lever hereafter more fully described. The gear 8 is provided with a hub 32 carrying other parts which move therewith, the whole assembly being pivoted upon a pin 30 carried by the frame 4.

The lever 20 previously referred to is pivoted upon a pin 26 and has an upwardly extending arm 28 adapted to be actuated during the operation of the machine as hereafter described.

Referring more particularly to Figure 3, the hub 32 of the gear 8 carries the pinion 34, which meshes with a pinion 36 journalled upon a transverse pin 37. This in turn meshes with a pinion 38, connected to a disc 40, which has a portion of its circumference cut away, as illustrated at 42. The pinion 38 and disc 40 are journalled upon a transverse pin 44, a suitable hub arrangement serving to connect the rotating parts. Also journalled upon the pin 44 and secured to and rotating with the pinion 38 and disc 40 is a gear 45, which meshes with a pinion 80 hereafter described.

Located in the vertical plane of the disc 40 is a circular disc 46 journalled upon a pin 50 and carrying a pinion 48 meshing with pinion 38. The disc 46 and pinion 48 are carried at one end of the pin 50, and while the opposite end of the pin has only a moderately loose fit in its side plate of the frame, the end to which the pinion 48 is adjacent is free to move within a slot 51 in the opposite side plate and is urged downwardly by a link 52, which embraces its end and is connected to a spring 54 at its lower end secured to the frame. By reason of this arrangement, the disc 46 is drawn toward the disc 40 so as to cooperate with the high portion of the latter disc to grasp the end of a ticket strip and feed the same. The ticket strip is guided between the feeding discs over a surface, indicated at 56, which is slotted for the extension of the gears and discs therethrough. The ticket strip is fed between the fixed blade 58 and the movable blade 60, which cooperate to cut ticket sections from the strip. The movable blade 60 is provided with an opening in which may engage a finger 62 pivoted to the upper end of a lever 64, which is journalled upon the pin 26 and provided with a tail portion adapted to be engaged by a roller 68 carried by the gear 34. A roller 69 serves to insure the positive rearward movement of the lever 64, though this lever is spring urged toward its rearward position by means of a spring 74. The movable knife is urged downward so as to tightly engage the fixed knife 58 by means of a link 70 pivoted to it and acted upon by a spring 72.

The finger 62 is pivoted to the upper end of a link 76, the lower end of which is pivoted at 78 to the lever 20, previously mentioned.

The pinion 80, arranged to be driven by the gear 45, has secured to it a pinion 82, which in turn meshes with a gear 84 journalled upon the pin 44 independently of the gears 38 and 45 and disc 40. This arrangement is such that when the gear 8 and pinions 34, 36 and 38 and their associated parts make a single revolution, the gear 84 will make only half a revolution. This gear 84 has projecting from it a pin 86. Journalled upon its hub is a carrier member 88 carrying a pin 90 the same radial distance from the pin 44 as the pin 86. The carrier 88 may occupy 'either' of two adjusted positions, illustrated in Figures 1 and 4. In the position illustrated in Figure 1, a screw 92 tapped into the carrier 88 is engaged in one end of an arcuate slot 94, whereas in the position illustrated in Figure 4 a screw 92 is located in the other end of this slot, being adapted to be retained in either end of the slot by an enlarged tapered portion, indicated at 96 in Figure 1.

When the adjustment is that of Figure 1, the pins 86 and 90 are located diametrically opposite each other. On the other hand, when the adjustment is that of Figure 4, the pins are located adjacent each other and, as will be evident from the description of the operation hereafter, they are so close that the practical effect is to have only the pin 86 perform any operation.

A link 98 is pivoted by means of a pin 100 to the lower end of the lever 20. Its forward end is provided with a hook 102 engageable with a transverse bar 104 secured to the frame. A spring 106 urges the link downwardly and rearwardly, as will be clear from Figure 1. Journalled on pin 108 is a key 110, which has a rearwardly extending arm 112 located in a vertical plane to engage the link 98. Carried by the link 98 is a block 114, above and overlapping which there is the hooked end 115 of a lever 116 pivoted at 117 to the frame and urged in a counter-clockwise direction, as viewed in Figure 5, by a spring 118. The pin to which the spring 118 is connected extends through a slot 120 in the frame plate, which limits the counter-clockwise position of the lever 116.

The forward end of the link 98 carries a pin which engages a slot in the lower end of a lever 122, the upper end of which carries teeth engaging with the operating pinion 124 of a counter 126. Upon each actuation of the lever 122, the counter is advanced to record the issue of a ticket. A single recording occurs upon each cycle of operation of the machine, irrespective of whether a single or double length ticket is issued.

A lever 130, journalled upon a transverse pin 131, is provided with a shaped end 128 overlying, and arranged to be engaged by, the pin 100 connecting the link 98 with the lever 20. The forward end of the lever 130 is arranged to engage a plate 132, normally spring urged upwardly, extending beneath all of the units and pivoted on a pin 133. When the lever 130 moves clockwise, the plate 132 is forced downward, causing a conducting element on the plate to engage spring fingers 134 to complete the driving motor circuit. Since such completion of the circuit takes piace when the lever 130 of any of the units is moved clockwise, any one of the units may control the driving of the motor, and through it, of the shaft 2. Because of the interrupted nature of the gear 8, however, the rotation of the shaft 2 will serve to actuate only that unit of which the key has been depresesd. In order to secure a proper continued operation, as will be described hereafter, there is a second lever 136, located adjacent the lever 130 and also pivoted on the pin 131. It is this latter lever which is provided with the arm 13 previously mentioned.

The ticket strip to be fed through the machine is led through a guide comprising lower and upper members 142 and 144, respectively. Pivoted at 146 to a fixed member 147 adjustable lengthwise of the guides is a lever 148 to which is pivoted at its upper end at 150 a finger 152 acted upon by a spring 154 serving to move it to a position limited by engagement of a tail of the finger with a stop lug 156 on lever 148. By rea-

son of the position of spring 154, it will be evident that it effects an extreme counter-clockwise positioning of finger 152 within slots in the plates 142 and 144. The finger 152 is adapted to engage holes in the ticket strip to adjust the same as described hereafter.

Pivoted at its lower end to the frame is a plate 157, to which is secured a second plate 158 supporting a roller 160 adapted to be acted upon by a cam 162 secured to the pinion 36. The position of the roller 160 with respect to plate 157 may be adjusted by means of an abutment screw 163, tending to spring the plates 157 and 158 apart. The upper face of plate 157 is faced with a soft platen material, for example of rubber composition, indicated at 164.

Arranged to be removably located in the unit is the printing assembly, indicated generally at 166, and comprising a pair of side plates joined to each other and carrying ratchet members 168 and 170 on the shafts of which is wound an inking ribbon 172 guided over rollers 174 and 176 past a printing plate 178 removably secured in the printing unit. The ribbon also extends past a dating head 180, which is of conventional construction and adapted to be adjusted through the medium of an arm 182 and a plunger 184 accessible at the top of the unit. The platen 164 is adapted to press the ticket material against the ribbon so that it will receive the impressions of the plate 178 and the dating head 180. If desired, a suitable numbering head may be provided which may be advanced in obvious fashion upon each operation of the unit.

To advance the inking ribbon to bring fresh portions adjacent the printing elements, a double pawl 186 is pivoted to a bell crank 192 mounted in the printing unit. This bell crank is provided with a smoothly rounded end 194 having a slot arranged to embrace a pin 196 carried by the upper end of a link 198 which is urged upwardly by a spring 199 into engagement with a fixed bar 202 on which the printing assembly rests. The link 198 is pivoted to a bell crank 200 journalled upon the shaft 37 and adapted to be rocked by means of an eccentric 140 carried by the gear 8.

To shift the pawl, so as to move the ratchet 168 or 170 selectively, there is pivoted to the bell crank 192 a lever 190, in which is mounted a spring pressed pin 188 adapted to act on the pawl 186 on either side of its pivotal connection to the bell crank 192.

The printing assembly is adapted to be readily removed from the unit, and for this purpose the side plates thereof are slotted, as indicated at 204, to embrace pins 206, while extending outwardly from the assembly are pins 208 adapted to be received within slots 210 in the upper portions of the side plates. By reason of this arrangement, the assembly may be readily lifted from the unit, but because of the direction of extent of the slots 204 and 210, it is held rigidly against movement under the action of the platen during a printing operation, the slots extending substantially at right angles to the direction of application of the force to effect printing.

In the operation of the machine to issue single length tickets, the screw 92 is in the position indicated in Figure 1, so that the pins 86 and 90 are diametrically opposite each other. When the machine is in its idle condition, the parts are located in the positions indicated in Figures 1, 2, 3 and 5.

Depression of the key 110 causes the extension 112 to raise bar 98, freeing shoulder 102 from bar 104. 98 is thereupon snapped to the left, as viewed in Figure 1, by the action of spring 106, causing a clockwise movement of lever 20, which frees pin 16 from restraint by shoulder 18, thereby permitting the segment 12 to move outwardly into mesh with pinion 6. At the same time, left hand movement of the pin 100 effects a rise of extension 128 of lever 130, which closes the motor circuit by pressing downward the plate 132. Consequently, the driving motor will be energized and rotation of gear 8 will begin.

At this time, the ticket strip will extend upwardly through the guides 142 and 144 and over plate 56, its upper end extending to the line of cutting of the knives 58 and 60. The ticket strip will not be engaged by the feeding disc 40, but the finger 152 will be engaged within a hole thereof, having previously produced a proper alignment of the strip, as described hereafter.

The initial movement of the bar 98 will cause the segment 122 to rock, thereby advancing the reading of the counter 126.

As rotation of gear 8 takes place in a counter-clockwise direction, pinion 36 will rotate clockwise and the first action of the machine will be that of cam 162 upon roller 160 to cause the ticket strip to be pressed against the inking ribbon 172 backed by the type 178 and the dating head 180. This action takes place with great rapidity and a good impression is thereby made upon the ticket.

Following the making of the impression, the next event in the operation is the feed of the ticket strip, which is occasioned by engagement of the high portion of the disc 40 with the strip, pinching it against the disc 46. The strip is thus advanced past the knives, and as this advance takes place, the finger 152 is pulled upwardly so that it leaves the hole in the strip and rides thereon until it can enter the next hole in the strip. As soon as it enters this hole, the ticket is released by the disc 40, and the action of the spring 154 thereupon pulls the finger backwardly and with it the ticket strip to produce a proper alignment of the ticket strip with the knives for the cutting operation. This action is essentially the same as that described in my Patent No. 2,125,443.

At about this time, the pin 90 will have engaged the upper end 28 of the lever 20 to rock it counterclockwise to bring the shoulder 18 into the path of the pin 16. As this action occurs, the pin 100 will be moved to the right releasing the lever 130. Just prior to such action, however, and in order to maintain the motor circuit closed, the arm 13 of the lever 136 will have been raised by the action of cam 15, so that the lever 136 will have been substituted for the lever 130 to hold the switch closed. As the lever 20 rocks counter-clockwise, it will raise the link 76 to move the pusher 62 upwardly to engage the movable knife 60. Following this action, the roller 68 will engage the lower end 66 of the knife actuating lever 64 to cause the movable knife 60 to make its cutting stroke. The cycle of operation is completed when the pin 16 engages the shoulder 18 to release the segment 12 from the pinion 6. Simultaneously, the arm 13 drops off the cam 15, permitting the plate 132 to move upwardly under the action of its spring to open the motor circuit.

During each cycle of operation, the bell crank 200 will be operated by the eccentric 140 to rock the bell crank 142 and thereby advance the inking ribbon 172 so as to bring a fresh portion in line with the type.

In the event that the key 110 was released prior to the end of the cycle of operation of the machine, it will be evident that the counter-clockwise movement of the lever 20 under the action of pin 90 will result in reengagement of the bar 98 with the bar 104, due to the downward pull of the spring 106. However, even if the key 110 is held downward, the machine will be stopped at the end of a single cycle by reason of the provision of the elements particularly illustrated in Figure 5. As will be noted from this figure, as the bar 98 is raised at the initiation of operation of the machine, it will raise upwardly the detent 116, the nose of which slightly overlaps the block 114. As the bar 98 moves downward and to the left, the block 114 slides under the nose 115.

If, now, the key 110 is held down, then as the bar 98 is moved forward to the right, it will be moved sufficiently far to clear the nose 115, so that upon release of the lever 20 by the pin 90, it will engage the nose 115, so that movement toward the rear which would permit a second cycle of operation to take place is prevented. A second operation can only be secured by first releasing the key and then again depressing it. The release of the key permits the bar 98 to move downwardly so that the block 114 can clear the nose 115 of the detent, which can move downwardly only to a limited extent by reason of the stopping action of the slot 120. As soon as the block 114 clears the nose 115, it may move slightly to the left until shoulder 102 engages bar 104. Thus the bar 98 is brought in position to be released by the key 110 without restraint by the detent 116.

In the next cycle of the machine, when the key is again depressed, the same series of operations will occur, but in this case the pin 86 will perform the function of the pin 90, it being remembered that the gear 84 rotates only a half revolution for every complete revolution of the gear 8.

The spring 74 is used to retract the movable knife before the end of a cycle, but to avoid any possibility of the knife's sticking, the roller 69 is provided to engage the lever 64 to insure its positive retraction of the knife prior to a feed of the ticket strip in a cycle of operation. Under normal conditions, the roller 69 may perform no function.

If a double length ticket is to be issued, the pin 90 is moved adjacent the pin 86 by adjustment of the screw 92 to the opposite end of the slot 94. At the beginning of a cycle of operation to issue a double length ticket, these pins will be in the positions illustrated in Figure 4.

The cycle of operation in issuing a double length ticket will be readily understood from the foregoing description of the issue of a single length ticket, remembering, however, that in this case the gear 84 must make a complete revolution rather than half a revolution before action upon the lever 20 takes place. As a result, when the time comes for the first movement of the lever 64 under the action of the roller 68, the link 76 will be in a lowered position with the pusher 62 below and out of engagement with the movable knife 60. Accordingly, while a rocking action of lever 64 occurs, the knife will not be moved, and consequently, the first half of the double length ticket will not be severed.

Similarly, as the pin 16 comes around to its normal stopping position in the first revolution of the gear 8, it will not engage the shoulder 18, and consequently meshing of the segment 12 with the pinion 6 will continue to begin the second rotation of gear 8. Thus, so far as the printing and feed are concerned, a double printing and feeding action occurs before the pin 86 engages the lever 20 to produce the cutting and stopping of the cycle. The pin 90 in this case merely follows the pin 86 and performs no active function, since the lever 20 will already have been locked in its counter-clockwise position upon passage of the pin 86 by the arresting of the bar 98, by either bar 102 or detent 116, depending upon whether or not the key was released after its first depression. Thus the machine may be very simply changed to issue single or double length tickets, the double length tickets having printed on them duplicate matter. The adjustment for securing the change is inaccessible below the conventional locked top plate of the machine so that tampering with it is prevented. When a change is to be made, the unit may be swung upwardly at its rear after removal of the top plate to make the screw 92 accessible. To this end, each unit is slotted, as indicated at 214 to receive a bar 216 secured across the front of the housing. The unit is held on this bar by means of a front cover plate 218 individual to the unit and secured to its frame 4.

It will be evident that the machine described herein may be readily made controllable by the use of coins, utilising conventional coin controlled mechanism to free the equivalent of the bar 98. Thus it may be made available for the automatic issuing of railroad tickets, for example, in suburban stations which have a large volume of sales of, for example, tickets to a main city station.

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

1. A ticket printing and issuing machine comprising cooperating type and platen means for printing a ticket strip, rotary feeding means located beyond the printing means in the direction of feed of the strip and arranged to grip and pull the strip past the printing means and then to release the strip, and spring actuated means located in advance of the printing means for continuously engaging the strip and openings therein and for exerting a pull thereon in a rearward direction following engagement of an opening, thereby moving and aligning it for printing upon its release by the rotary feeding means.

2. A ticket printing and issuing machine comprising cooperating type and platen means for printing a ticket strip, rotary feeding means located beyond the printing means in the direction of feed of the strip and arranged to grip and pull the strip past the printing means and then to release the strip, means for severing the strip located beyond the rotary feeding means in the direction of feed of the strip, means for effecting severing of the strip by the severing means, and spring actuated means located in advance of the printing means for continuously engaging the strip and openings therein and for exerting a pull thereon in a rearward direction following engagement of an opening, thereby aligning it for printing and severing upon its release by the rotary feeding means.

3. A ticket printing and issuing machine comprising cooperating type and platen means for printing a ticket strip, rotary feeding means located beyond the printing means in the direction of feed of the strip and arranged to grip and pull the strip past the printing means and then to release the strip, means for severing the strip

located beyond the rotary feeding means in the direction of feed of the strip, means for effecting severing of the strip by the severing means, and spring actuated means located in advance of the printing means for continuously engaging the strip and openings therein and for exerting a pull thereon in a rearward direction following engagement of an opening, thereby moving and aligning it for printing and severing upon its release by the rotary feeding means.

4. A ticket printing and issuing machine comprising cooperating type and platen means for printing a ticket strip, rotary feeding means located beyond the printing means in the direction of feed of the strip and arranged to grip and pull the strip past the printing means and then to release the strip, means located in advance of the printing means for engaging openings in the strip, and means for yieldingly imparting movements to the last mentioned means to effect retrograde movements of the strip thereby to align it for printing upon its release by the rotary feeding means.

5. A ticket printing and issuing machine comprising cooperating type and platen means for printing a ticket strip, rotary feeding means located beyond the printing means in the direction of feed of the strip and arranged to grip and pull the strip past the printing means and then to release the strip, means for severing the strip located beyond the rotary feeding means in the direction of feed of the strip, means for effecting severing of the strip by the severing means, means located in advance of the printing means for engaging openings in the strip, and means for yieldingly imparting movements to the last mentioned means to effect retrograde movements of the strip thereby to align it for printing and severing upon its release by the rotary feeding means.

REUBEN H. HELSEL.