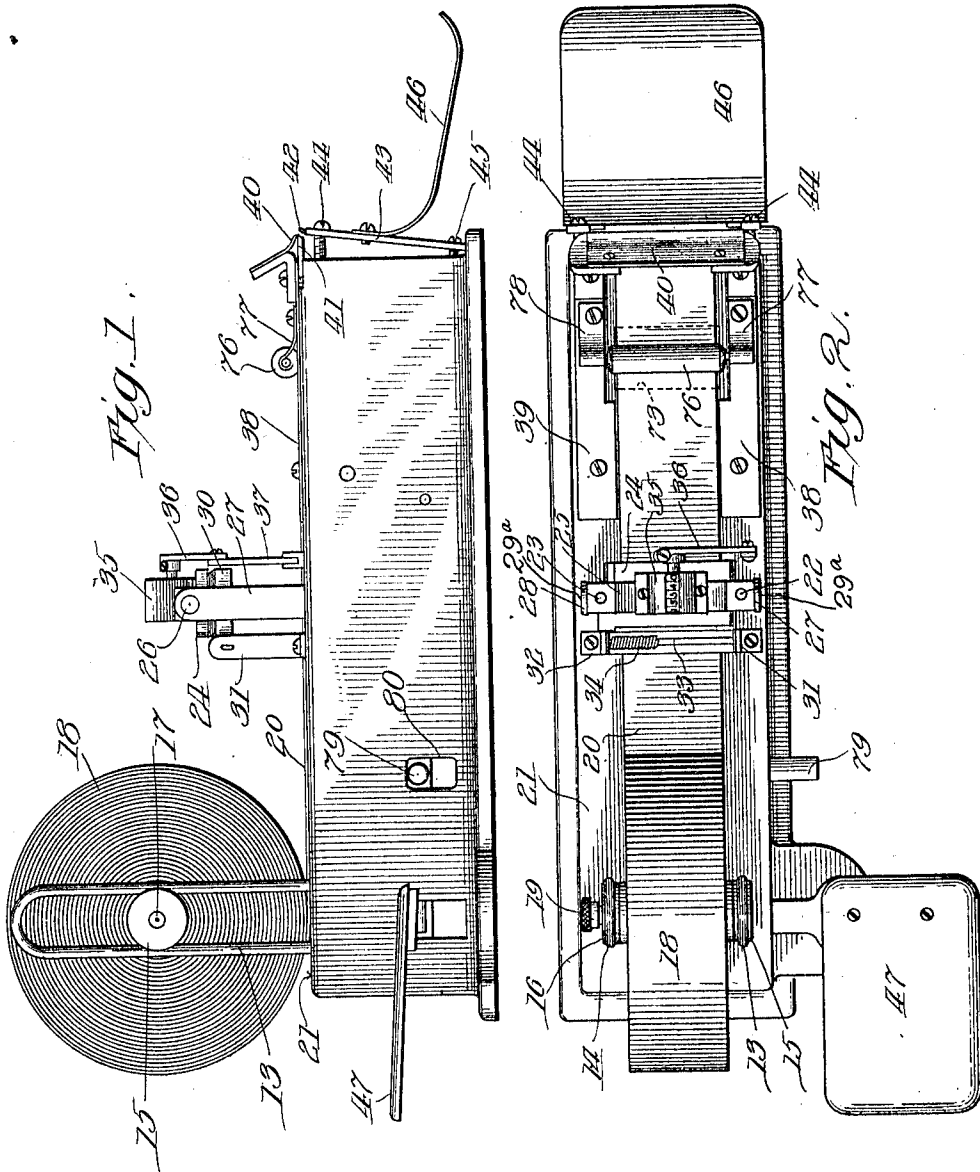


T. M. VAUGHAN.
TICKET PRINTING MACHINE.
APPLICATION FILED JULY 19, 1910.

984,403.

Patented Feb. 14, 1911.

4 SHEETS-SHEET 1.



Witnesses:
Harry S. Gaither
Ephraim Banning

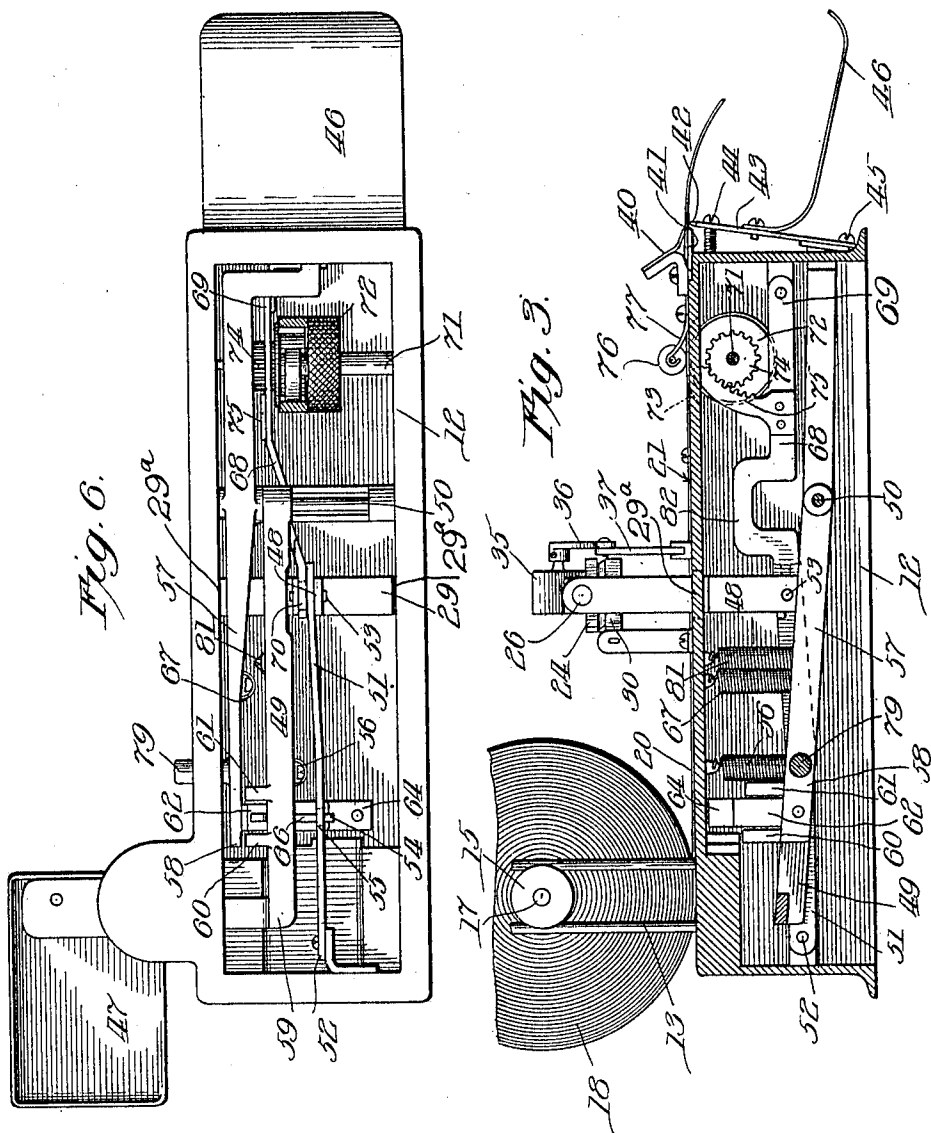
Inventor:
Thomas M. Vaughan
by Banning & Banning
attys

T. M. VAUGHAN.
TICKET PRINTING MACHINE.
APPLICATION FILED JULY 19, 1910.

984,403.

Patented Feb. 14, 1911.

4 SHEETS-SHEET 2.



Witnesses:

Harry S. Gauthier
Ephraim Banning

Inventor
Thomas M. Vaughan

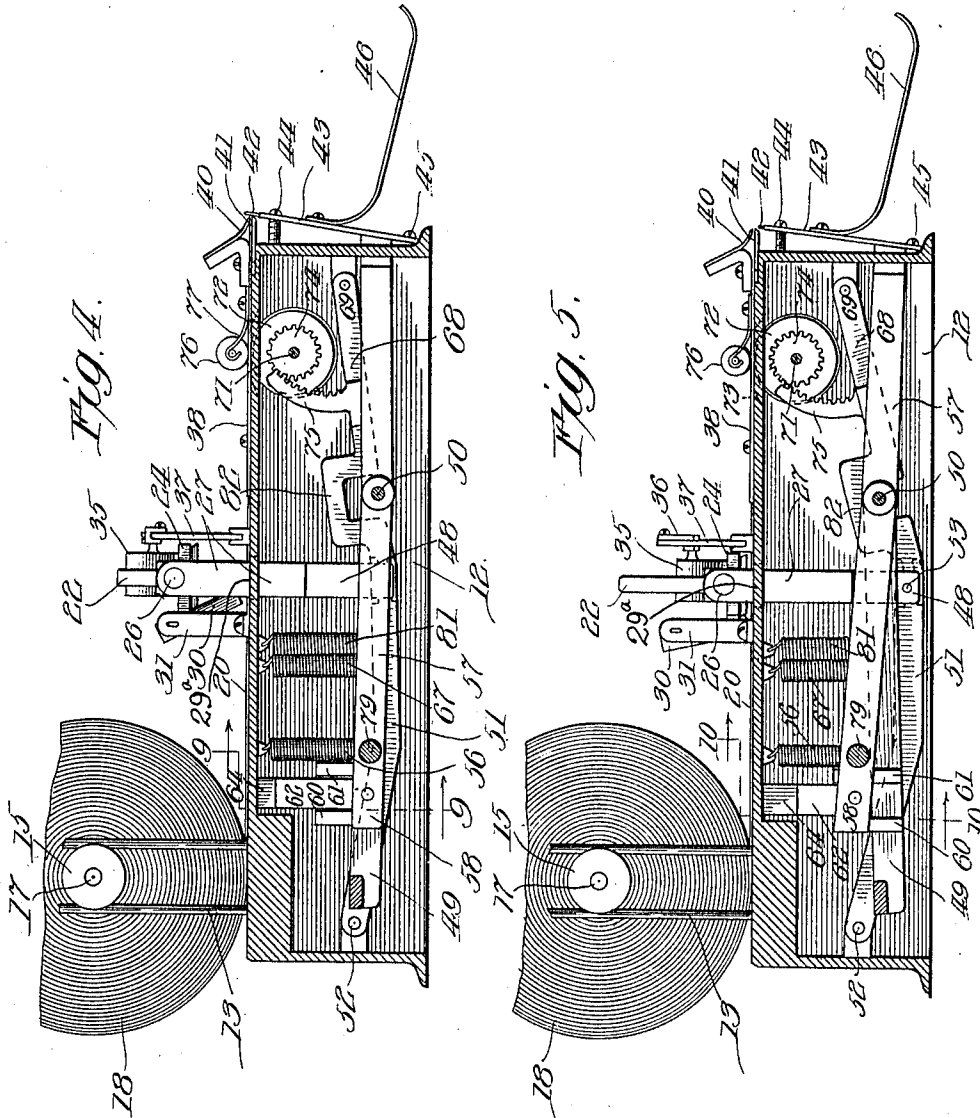
by Banning & Banning attys

T. M. VAUGHAN.
TICKET PRINTING MACHINE.
APPLICATION FILED JULY 19, 1910.

984,403.

Patented Feb. 14, 1911.

4 SHEETS—SHEET 3.



Witnesses:

Harry S. Gaither
Ephraim Banning

Inventor:

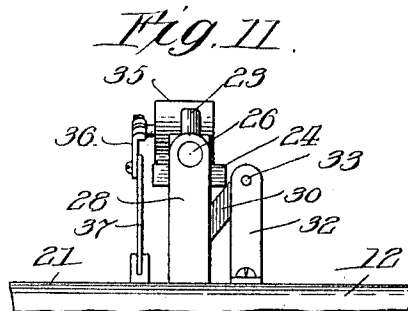
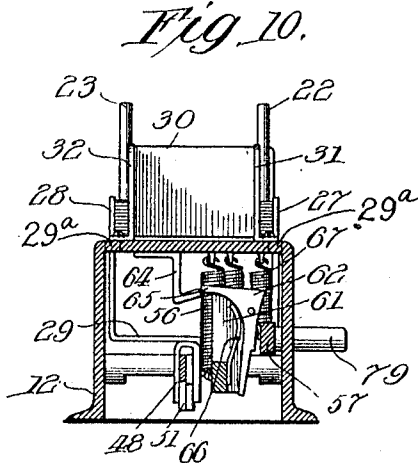
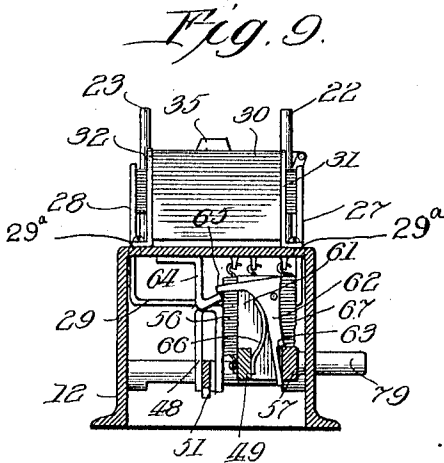
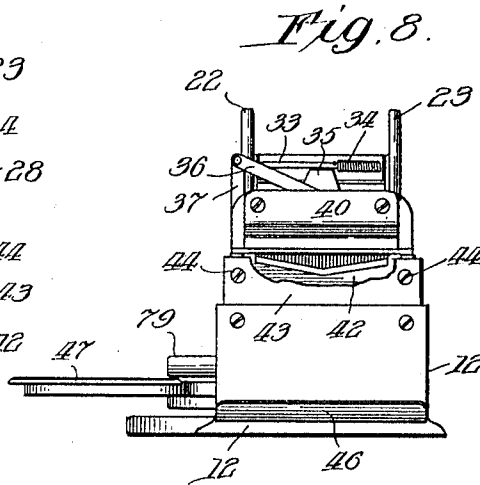
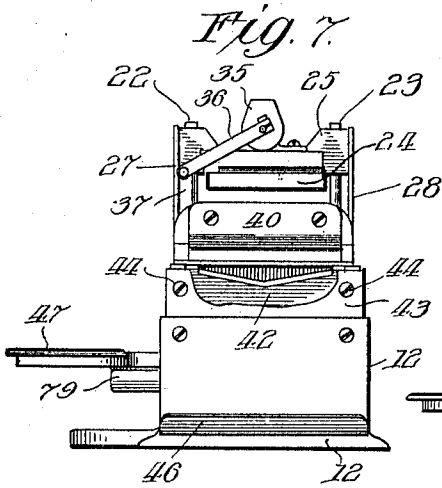
Thomas M. Vaughan
by Banning & Banning
Attys

T. M. VAUGHAN.
TICKET PRINTING MACHINE.
APPLICATION FILED JULY 19, 1910.

984,403.

Patented Feb. 14, 1911.

4 SHEETS-SHEET 4.



Witnesses:

Harry S. Gaither
Arthur Banning

Inventor:
Thomas M. Vaughan

by Banning & Banning
Attys

UNITED STATES PATENT OFFICE.

THOMAS M. VAUGHAN, OF DETROIT, MICHIGAN, ASSIGNOR TO BOX OFFICE TICKET PRINTING MACHINE COMPANY, A CORPORATION OF ILLINOIS.

TICKET-PRINTING MACHINE.

984,403.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed July 19, 1910. Serial No. 572,656.

To all whom it may concern:

Be it known that I, THOMAS M. VAUGHAN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Ticket-Printing Machines, of which the following is a specification.

This invention relates particularly to a type of ticket printing machine intended to be placed in ticket booths from which the tickets are sold one at a time.

It is intended to provide a machine which may be operated, not by withdrawing the tickets from the machine by pulling on the web, but rather by a mechanical operation, such as the depression of a hand plate.

It is furthermore intended to provide a machine such that the web containing the printed tickets cannot be reached from the front of the machine except as the tickets are projected and cut off and dropped into a suitable receptacle.

It is furthermore intended to provide a machine of few parts, operating in a simple manner and with comparative ease, so that the parts may not become easily disarranged, and so that a minimum amount of labor shall be necessary in the printing operation.

It is also intended to provide a machine such that the type may be changed from time to time, such that a correct record will be kept of the number of tickets printed, such that the cutting device which severs the tickets from the web may be easily gotten at either for sharpening or replacement or for adjustment; and to provide a machine of which the parts will automatically be restored to their initial position after the completion of the working stroke.

Other objects and uses will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings—Figure 1 shows a view of the machine looking toward the side from which projects the hand plate, all of the parts being in their initial position; Fig. 2 shows a plan view similar to Fig. 1; Fig. 3 shows a cross-sectional view of the machine, the side plate being removed and the working parts being in initial position; Fig. 4

shows a view similar to Fig. 3, the working stroke being about half completed, so that the cutting knife is in completely elevated position; Fig. 5 is a similar view, the printing stroke being complete and the cutting knife being released and restored to its initial position to permit the web to be projected past the same at the commencement of the return stroke which feeds the web; Fig. 6 is a bottom view of the machine, the parts being in their initial position; Fig. 7 is a front view of the machine, the parts being in their initial position and a portion of the front end being cut away to show the form of the cutting knife; Fig. 8 is a view similar to Fig. 7, the working stroke having been completed and the cutting knife being restored to its initial position as in Fig. 5; Fig. 9 is a cross section of the machine taken on the line 9—9 of Fig. 4, looking in the direction of the arrows; Fig. 10 is a cross section of the machine taken on the line 10—10 of Fig. 5, looking in the direction of the arrows; and Fig. 11 is a detail view of the type carrying and inking mechanism, showing them in partly depressed position.

In the embodiment of my invention, I provide a type carriage adapted to operate in a substantially vertical manner, so that the impression will be made on the web, which passes along on the upper surface of the body portion, by drawing the type carriage vertically down against the web. In order to operate the machine, a hand plate is preferably provided, suitably located and formed so that the same may be forced downward by pressure upon it with the palm of the hand, although it will be understood that any equivalent construction may be used. After the impression has been made, the web is fed forward by means of a feeding roll, which grips the web by exerting a sufficient pressure on it against the reaction of a backing roll.

The form of the machine is such that the ticket printed by a given stroke is not severed from the web until a subsequent stroke is performed; therefore I provide a cutting device which operates to sever a previously printed ticket at the same time that the impression is being taken. After having severed this ticket, and before the return stroke which feeds the web commences, the cutting

knife is restored to a position such that it will not interfere with the projection of a new ticket into position to be cut off by the cutting device during the next stroke. I
 5 further provide means for supporting the web of material in such a way that it will be fed from the roll flatly along the upper surface of the body portion at all times, regardless of the amount which has been unrolled
 10 from the roll.

Referring now to the drawings, the body portion of my machine comprises an inverted hollow box 12 within which may be placed the proper operating mechanisms.
 15 At its rear end are carried two inverted U-shaped guideways 13 and 14, in which may operate rollers 15 and 16 on the ends of a shaft 17 which carries the web roll 18. The shaft 17 may be in the form of a pin provided with a head 19 so that it may be easily withdrawn in order to replace the web roll or to adjust the same. The web 20 may be drawn off from the web roll 18 along the upper surface 21 of the body, so that the web
 25 will always lie flat against said surface.

Near the central portion of the body I provide two vertical guide rods 22 and 23, which guide the printing carriage in its movements. The printing carriage comprises essentially a type plate 24 carried on a cross bar 25, having near its ends holes for receiving the guide rods 22 and 23. The ends of the cross bar 25 terminate in lugs or pins 26 adapted to engage holes in the upper ends of actuating arms 27 and 28. These
 35 actuating arms are preferably the upwardly extending arms of a U-shaped plate whose cross connection 29 spans the interior portion of the body, the arms passing up through the upper surface of the body 21 through properly formed slots 29^a. The mechanism within the body which actuates this U-shaped piece will be hereinafter described.

An inking pad 30, of suitable form, is carried by means of standards 31 and 32 suitably attached to the upper surface 21 of the body portion, this inking pad being hinged to said standards by means of a rod 33, and a
 50 spring 34 always tends to keep the pad in the upward horizontal position shown in Fig. 1, whereby when the printing carriage is in its uppermost or initial position the type will be properly inked. It will be understood that as the printing carriage is
 55 pulled down its edge nearest the shaft 33 will cause the inking pad to be rotated in a substantially vertical position, as shown in Fig. 5; but it will be also understood that as the printing carriage moves back to its initial position the printing pad will also follow up.

A counter 35 may be suitably attached to the machine in any location and in any manner whereby a unit will be counted each

time a ticket is printed. The preferred arrangement is one in which this counter is attached to the upper portion of the printing carriage, a crank 36 connecting the counter to a rod 37 attached to the upper portion of the body so that as the carriage rises and falls the crank will be oscillated, thereby actuating the counter.

A pair of guideways 38 and 39 may be suitably placed to guide the web in its forward movement after the printing operation has been performed. A cutting edge 40 is adjustably attached to the forward end of the machine, adjacent a guide-bar 41, the web passing between the cutting edge and the guide-bar and being supported by them in proper position so that a knife 42, operating adjacent the edge 40, will properly sever the web. The knife 42 is carried in an adjustable guide-plate 43 attached to the front portion of the machine in a manner such that its exact position may be adjusted by means of screws 44 and 45—that is, by properly manipulating these screws the knife can be adjusted in or out so that it will pass
 90 close enough to the fixed blade 40 to properly sever the web. A receptacle 46 may be attached to the plate 43 to properly receive the tickets after they are severed from the web.

A hand plate 47 is provided for operating the machine, as will now be described. Referring now particularly to the figures in section, a U-shaped link 48 (see particularly Figs. 9 and 10) is attached to the cross piece 29 of the carriage operating device near its center. The hand plate 47 is attached to the end of a lever 49 pivoted to the body portion 12 by means of a pin 50. Referring to Fig. 6, a link 51 is seen pivoted at its end to the body portion at 52. This link is connected at its other end by means of a pin 53 to the U-shaped link 48, so that as the link 51 moves up and down it will carry with it the connection 29 and therefore the printing carriage. A pin 54, attached to the lever 49, engages a slot 55 of the link 51, so that by raising and lowering the hand plate 47, and therefore the lever 49, the link 51 will be raised and lowered to actuate the printing carriage. A spring 56 connected to the lever 49 and to the upper face of the body portion always tends to hold the hand plate and therefore the printing carriage in upper or initial position. A lever 57, which may also be pivoted on the pin 50, is attached at its forward end to the cutting knife 42 so that as the rear end 58 of this lever is depressed the cutting knife will be raised to sever the web. The rear end 59 of the lever 49 is provided on its side with a pair of upwardly projecting lugs 60 and 61, to whose upper ends is pivoted a bell crank 62, shown more particularly in Figs. 9 and 10. This bell crank is provided with a shoulder 63 which

will engage the end 58 of the lever 57 when the bell crank is in its upper position (see Fig. 9). A trip or stop 64 is attached to the upper portion of the body, so that as the bell crank is drawn down its end 65 will engage this stop, thus being rotated over into the position of Fig. 10 and thereby releasing the end 58 of the lever 57. A spring 66 normally tends to hold the bell crank in the position of Fig. 9. Evidently when the lever 49 is in upper position, thus raising the bell crank 62, the shoulder 63 will come into engagement with the end 58 of the lever 57. Thereafter depression of the lever 49, such as will occur upon pressing down the hand plate 47, will carry down also the bell crank and lever 57 until the end 65 of the bell crank comes into such engagement with the stop 64 as to rotate the shoulder 63 out of engagement with the lever 57, which will thereupon be released and restored to its initial position by means of a spring 67.

From the above it is seen that, in operation, as the hand plate 47 is depressed to perform the printing operation, the cutting lever 57 will be actuated until the printing stroke has almost been completed; thereupon the bell crank 62 will serve to release the lever 57 in such a way that the latter, and therefore also the cutting knife 42, will be restored to its initial position, thus providing a clear passageway for the web between the cutting blades.

The mechanism which I provide for feeding the web after the printing stroke is complete, and after the cutting blade has been released, is as follows: A link 68 is pivoted at its forward end 69 to the forward end of the base portion. At its rear end it is provided with a slot 70, which engages the pin 53, so that as this pin rises and falls in accordance with the movements of the hand plate the link 68 will be rotated back and forth about its end 69. A shaft 71 carried by the body portion carries a feed-roll 72 provided with a properly corrugated surface and so placed as to project up a slight amount through a slot 73 in the upper surface of the body portion, where it may engage the web. A pinion 74, also carried by the shaft 71, meshes with a segmental gear 75 carried by the link 68, so that as said link rises and falls during the printing operations the segmental gear will oscillate the pinion 74 back and forth. A clutch of any suitable form connects the pinion 74 with the feed-roll 72, so that said pinion can rotate with respect to the feed-roll in a direction contrary to the rotation of said roll during the feeding process, but so that it cannot rotate in a direction, with respect to the feed-roll, the same as that necessary to feed the web. In other words, when the link 68 falls on the downward stroke of the hand plate the segmental gear and pinion meshing to-

gether will rotate in a direction contrary to that necessary to feed the web, while the roll 72 remains stationary. As soon as the upstroke of the hand plate commences, the segmental gear will be carried up, thus rotating the pinion 74 in the reverse direction and forcing the feed-roll 72 to rotate in a direction to advance the web. A backing roll 76 is in proper position with respect to the feed-roll to properly engage the top side of the web during the feeding process. This backing roll is preferably carried by means of a pair of stiff, U-shaped springs 77 and 78, attached to the upper surface 21 of the body portion.

When desired, a stud 79 may be provided on the lever 57, said stud projecting out through a slot 80 in the side wall of the body so that the cutting knife can be actuated independently of the rest of the mechanism. Also, when desired, an additional spring 81 may be attached to the link 49 so as to provide sufficient force for restoring the printing carriage and associated parts to their initial position.

By making the U-shaped portion, including the arms 27 and 28 and the cross connection 29 of proper flexible but stiff material, the upper ends of the arms 27 and 28 may be bent outward a sufficient amount when in upper position to disengage from the pins 26 of the bar 25, thus releasing the carriage and permitting the same to be removed for replacement or adjustment.

Owing to the compact manner in which the several parts of this machine are arranged, it is necessary to make the links of peculiar formation; for example, the link 68 should be provided with an offset 82, so as to pass the pin 50 and neighboring portions. It is evident, however, that such peculiarities do not in any way influence the mode of operation of the machine but are mere mechanical details.

The machine is one in which the parts are arranged with great compactness, and yet in such a way that they are easily accessible for repair or adjustment, it being only necessary to turn the machine upside down to get at all of the working parts. At the same time the parts may be compactly related so as to place them within small compass, thus economizing in space and material.

The knife 42 is preferably provided with a cutting edge having a depression near its central part so that in the cutting operation the web is severed near its edges first, the cut gradually moving in from both sides toward the center. Such a form of knife severs the web with greater ease than one having a straight edge, and also there is no tendency to shove the web to one side, as there would be when using a knife whose edge is tilted in such a manner that the

cutting operation starts at one edge of the web and moves clear across to the other edge.

I claim:

5 1. In a ticket printing machine, a body portion, a web supporting device, a printing device, a web severing device, a feeding device and means for operating said devices, the body portion being in the form
10 of an inverted hollow box adapted to receive the operating means and the web feeding means, the web severing device comprising a fixed cutting edge and a knife movable in a substantially vertical manner adjacent the cutting edge, the web feeding device comprising a frictional feed roll within the base portion and a backing roll adjacent the feed roll and adapted to maintain the web in frictional contact with the feed
20 roll, and the printing device comprising a type plate vertically movable with respect to the body portion, the type plate being carried by a U-shaped plate and the upper side of the body portion being provided
25 with holes for receiving the arms of the U-shaped plate, a pinion adjacent the feeding roll and means for connecting said pinion to the feeding roll in a manner whereby the pinion will act to rotate the feed roll in the
30 feeding direction and whereby the pinion may be restored to its initial position without rotating the feed roll, the operating means comprising a plurality of coacting levers, including a type actuating lever, a
35 feeding lever and a web severing lever, the feeding lever being provided with a segmental gear adapted to mesh with the aforesaid pinion, and the type operating lever and feeding lever adapted to always work
40 in unison, and the web severing lever adapted to operate with the afore-mentioned levers during a portion of the printing stroke and adapted to be released and restored to its initial position prior to the
45 commencement of the feeding stroke, substantially as described.

2. In a ticket printing machine, a body portion, a web supporting device, a printing device, a web severing device, a feeding
50 device and means for operating said devices, the body portion being in the form of an inverted hollow box adapted to receive the operating means and the web feeding means, the web severing device comprising a fixed
55 cutting edge and a knife movable in a substantially vertical manner adjacent the cutting edge, the web feeding device comprising a frictional feed roll within the base portion and a backing roll adjacent the feed
60 roll and adapted to maintain the web in frictional contact with the feed roll, and the printing device comprising a type plate vertically movable with respect to the body portion, the type plate being carried by a
65 U-shaped plate and the upper side of the

body portion being provided with holes for receiving the arms of the U-shaped plate, a pinion adjacent the feeding roll and means for connecting said pinion to the feeding
70 roll in a manner whereby the pinion will act to rotate the feed roll in the feeding direction and whereby the pinion may be restored to its initial position without rotating the feed roll, the operating means comprising a plurality of coacting levers, including a main lever, a type operating lever,
75 a feeding lever and a web-severing lever, the main lever adapted to operate the printing lever and the feeding lever in a manner whereby all of said levers act in unison and the main lever being provided with a clutch adapted to operate the cutting lever during a portion of the printing stroke and then to release the same, and the feeding lever
80 being provided with a segmental gear adapted to mesh with the afore-mentioned pinion, substantially as described.

3. In a ticket printing machine, the combination of a frame member provided in its upper surface with a pair of arm slots and
90 with a feed roll slot, a power lever pivoted to the frame member, a link pivoted to the frame member, a U member having its arms upwardly extended through the slots, a feed link pivoted to the forward portion of the
95 body member, a feed roll pivoted in the forward portion of the body member and extending up through the feed roll slot, a connection from the feed link to the feed roll, a pivotal connection from the link to the
100 feed link and to the U member, a connection from the power lever to the link, cutting mechanism suitably connected to the power lever, and a printing plate suitably connected to the upwardly extending arms of
105 the U member, substantially as described.

4. In a ticket printing machine, the combination of a body member, a power lever pivoted to the central portion of the same, a link pivoted to the rear portion of the body
110 member, a feeding link pivoted to the forward portion of the body member, a feed roll pivoted to the forward portion of the body member, a connection between the feed link and the feed roll, printing mechanism,
115 a connection therefrom to the link, and a connection from the feed link to the link, and cutting mechanism suitably connected to the power lever, substantially as described.

5. In a ticket printing machine, the combination of a body member provided in its upper face with a pair of oppositely disposed slots, a resilient U member having its cross connection beneath the upper face of
125 the body member and having its arms upwardly projecting through the slots of the latter, a pair of guide rods upwardly extending from the upper face of the body member, a type plate carried by the guide rods
130

and vertically movable on them, a pair of lugs outwardly projecting from the type plate to engage the arms of the resilient U member, means for advancing the web, means for severing the same, and means for operating the advancing mechanism and cutting mechanism and for raising and lowering the U member to raise and lower the type plate for printing purposes, substantially as described.

6. In a ticket printing machine, the combination of a body member provided in its upper face with a pair of oppositely disposed slots and with a feed roll slot, a power lever pivoted to the central portion of the body member and provided with an outwardly extending hand pressure plate, means for restoring the power lever to its upper position after being depressed, a U member having its cross piece within the body member and having its arms upwardly extending through the oppositely disposed slots of the same, a type plate carried by the arms of the latter, a shaft within the body member, a feed roll on the same and extending upwardly through the feed roll slot,

a pinion on the shaft adjacent the feed roll, a clutch connection from the pinion to the feed roll, and a connection from the power lever to the U member and to the pinion, substantially as described.

7. In a ticket printing machine, the combination of a body member provided in its upper face with a pair of oppositely disposed slots, a U member having its cross piece within the body member and its arms upwardly extending through the oppositely disposed slots, a type plate carried by the upper ends of the arms of the U member, an inking pad, pivotal supporting means for the same adjacent the type plate, means for upwardly rotating the inking pad to bring the same into working engagement with the type plate when the latter is raised, feeding mechanism, and means for raising and lowering the U member and for operating the feeding mechanism, substantially as described.

THOMAS M. VAUGHAN.

Witnesses:

FRANCES STELLA WATSON,
F. D. TINDOLPH.