May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 1

FIG. 2.

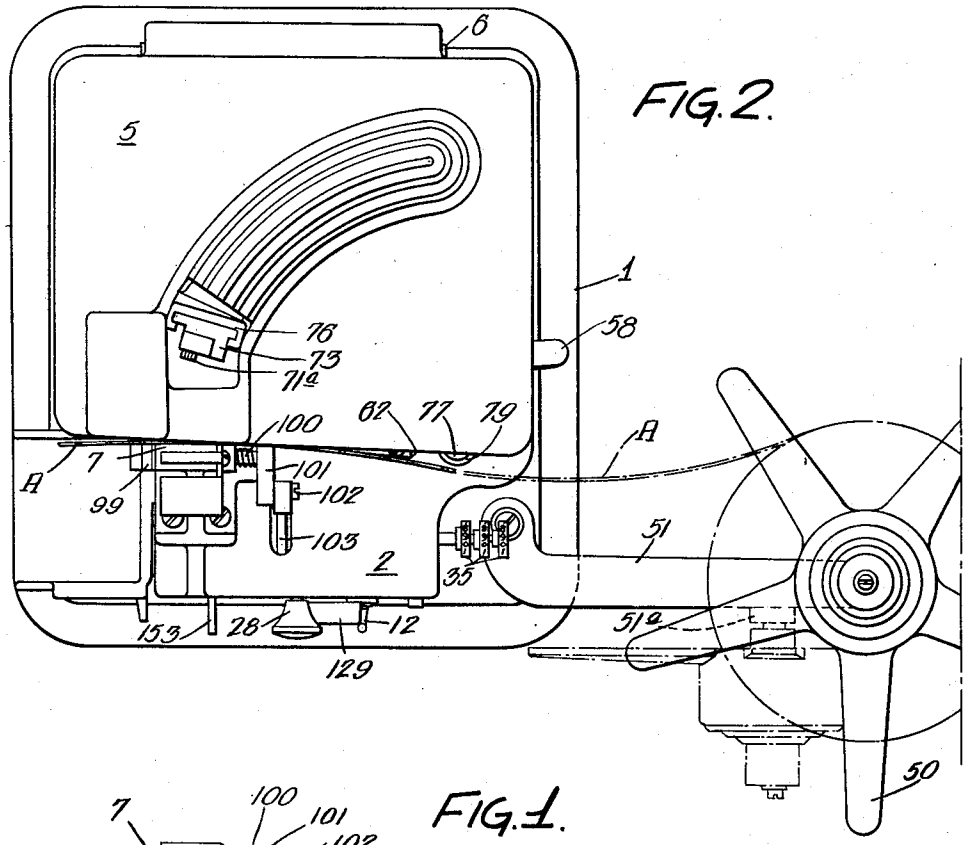
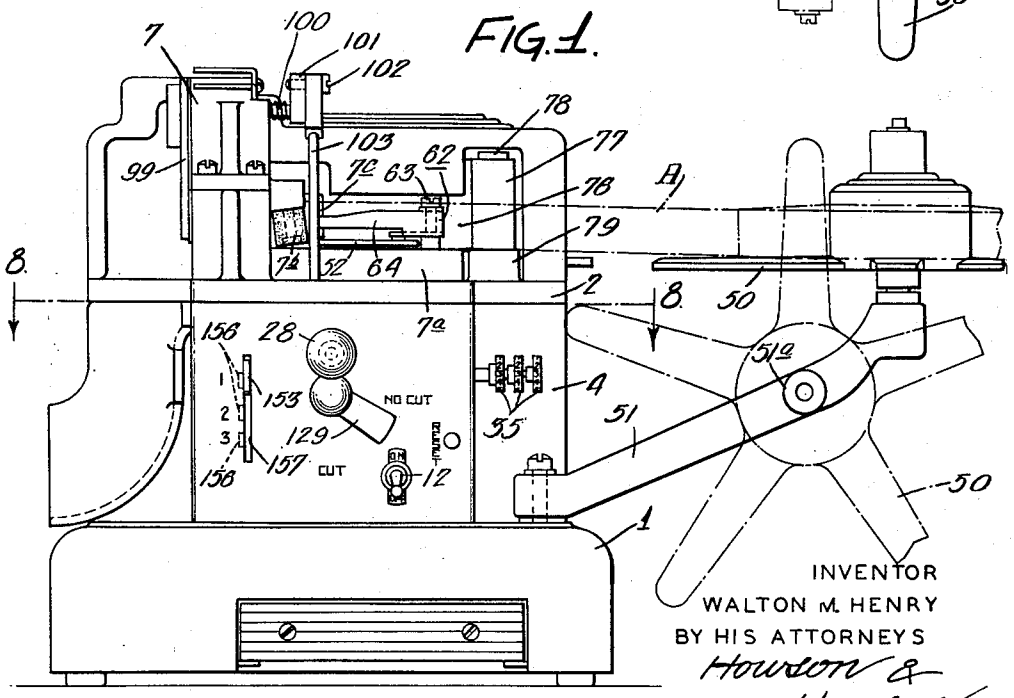


FIG. 1.



INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 2

FIG. 3.

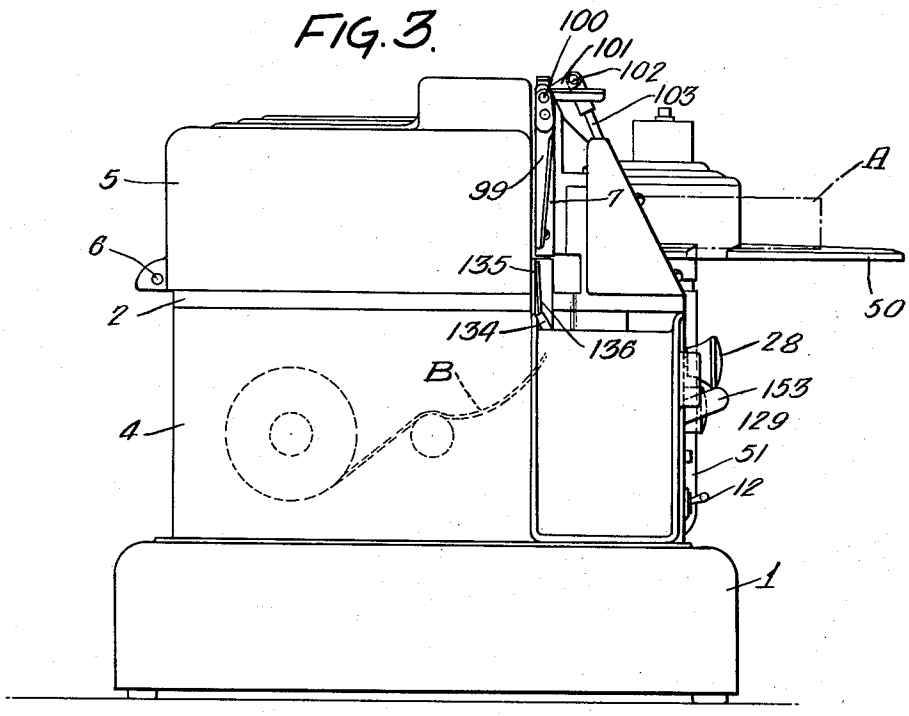
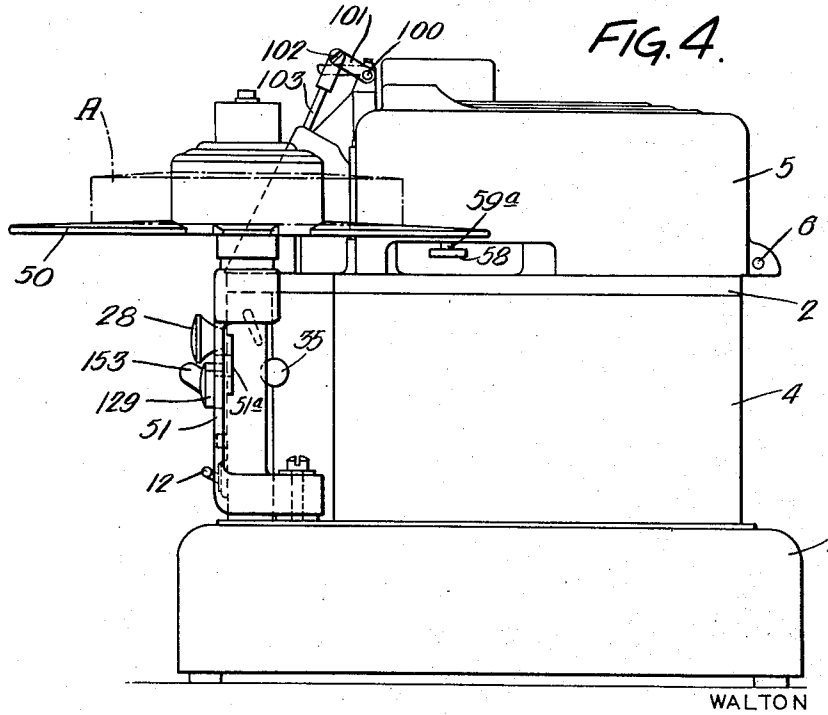


FIG. 4.



INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 3

FIG. 5.

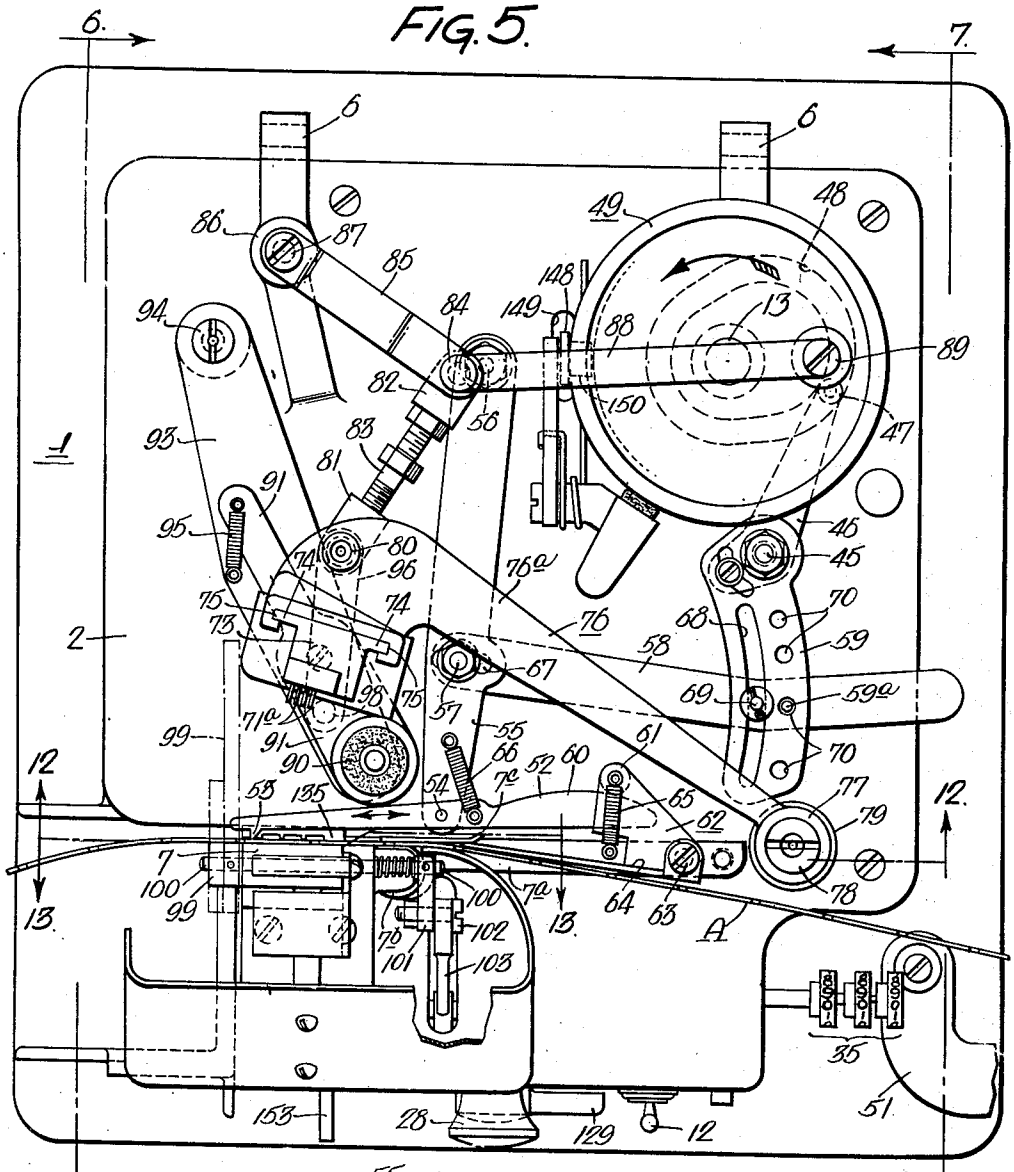
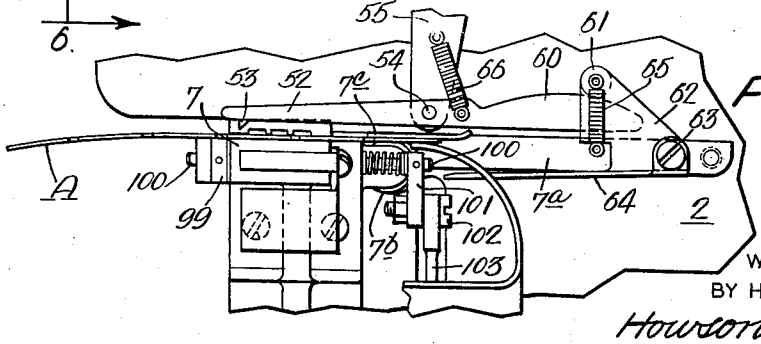


FIG. 9.



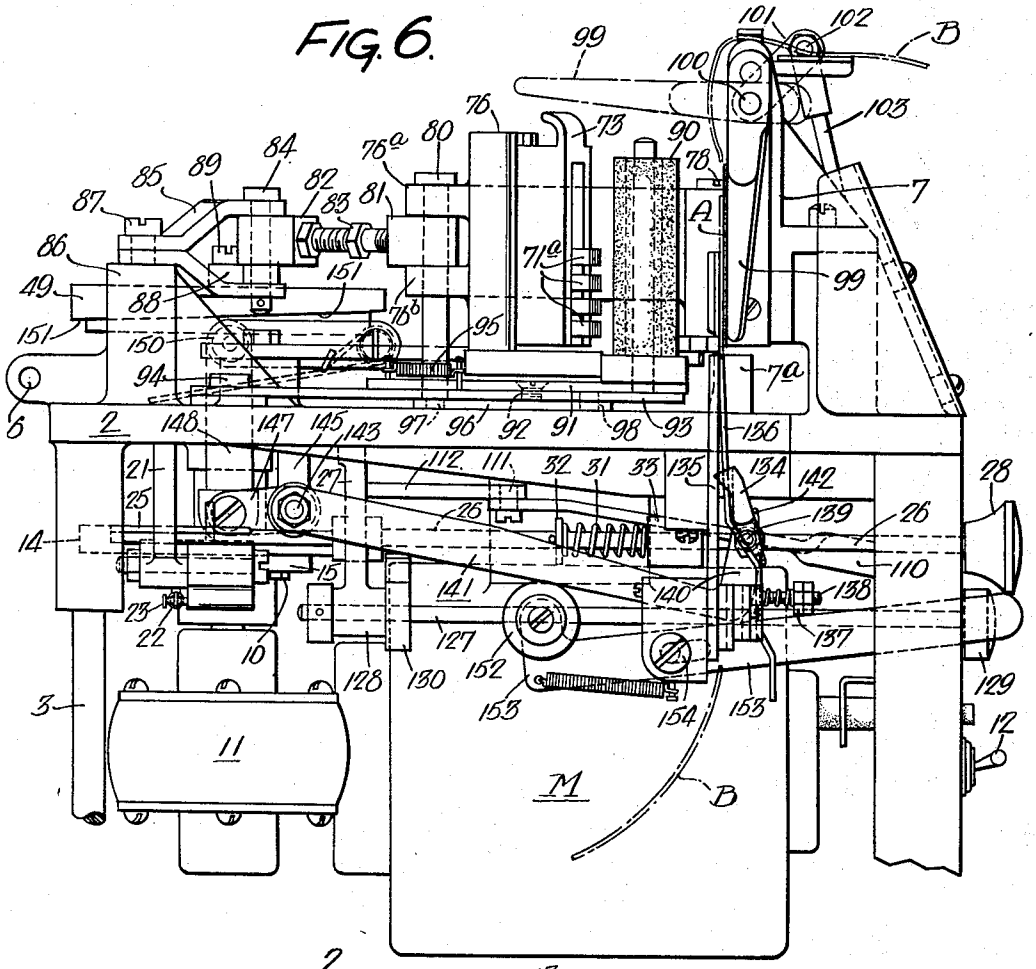
INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 4

FIG. 6.



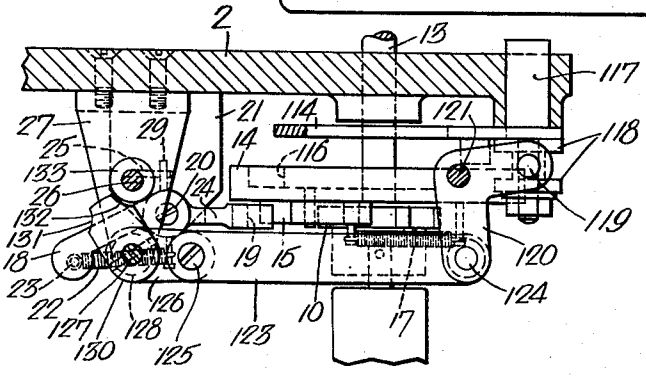


FIG. 10.

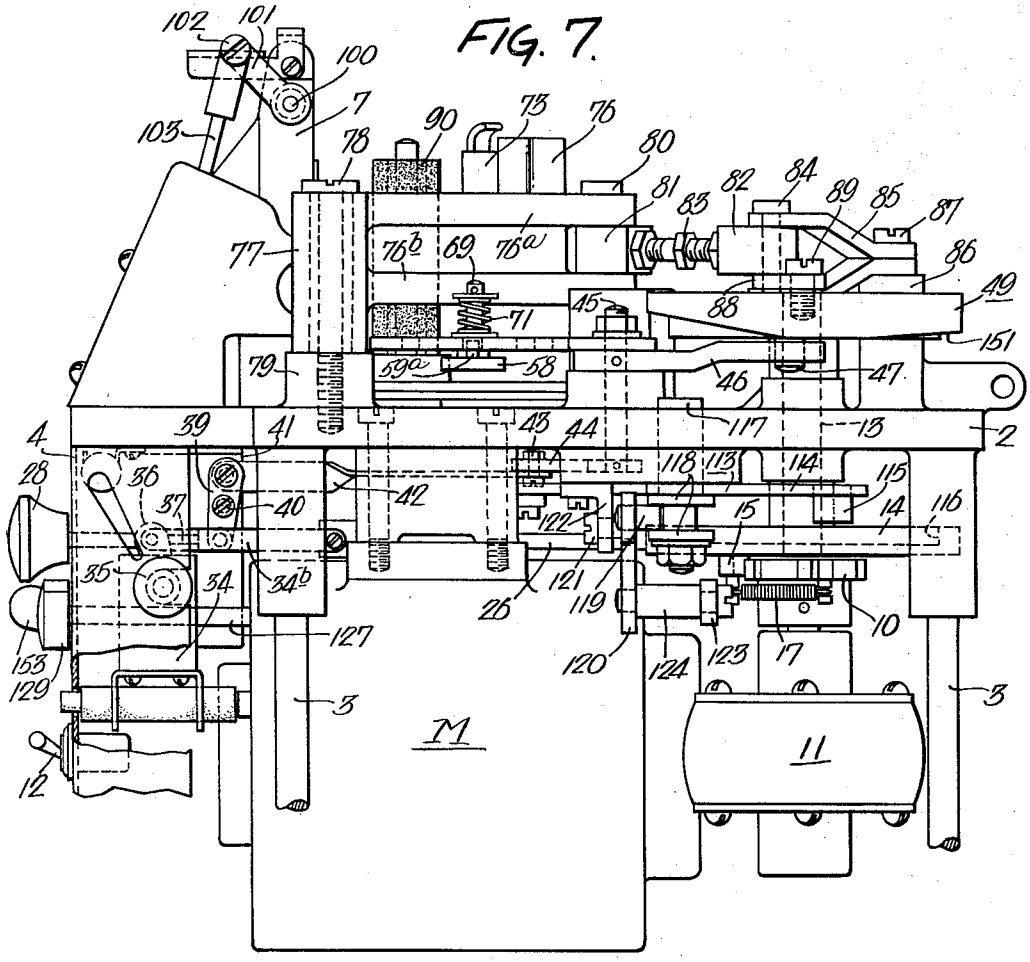
INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 5

FIG. 7.



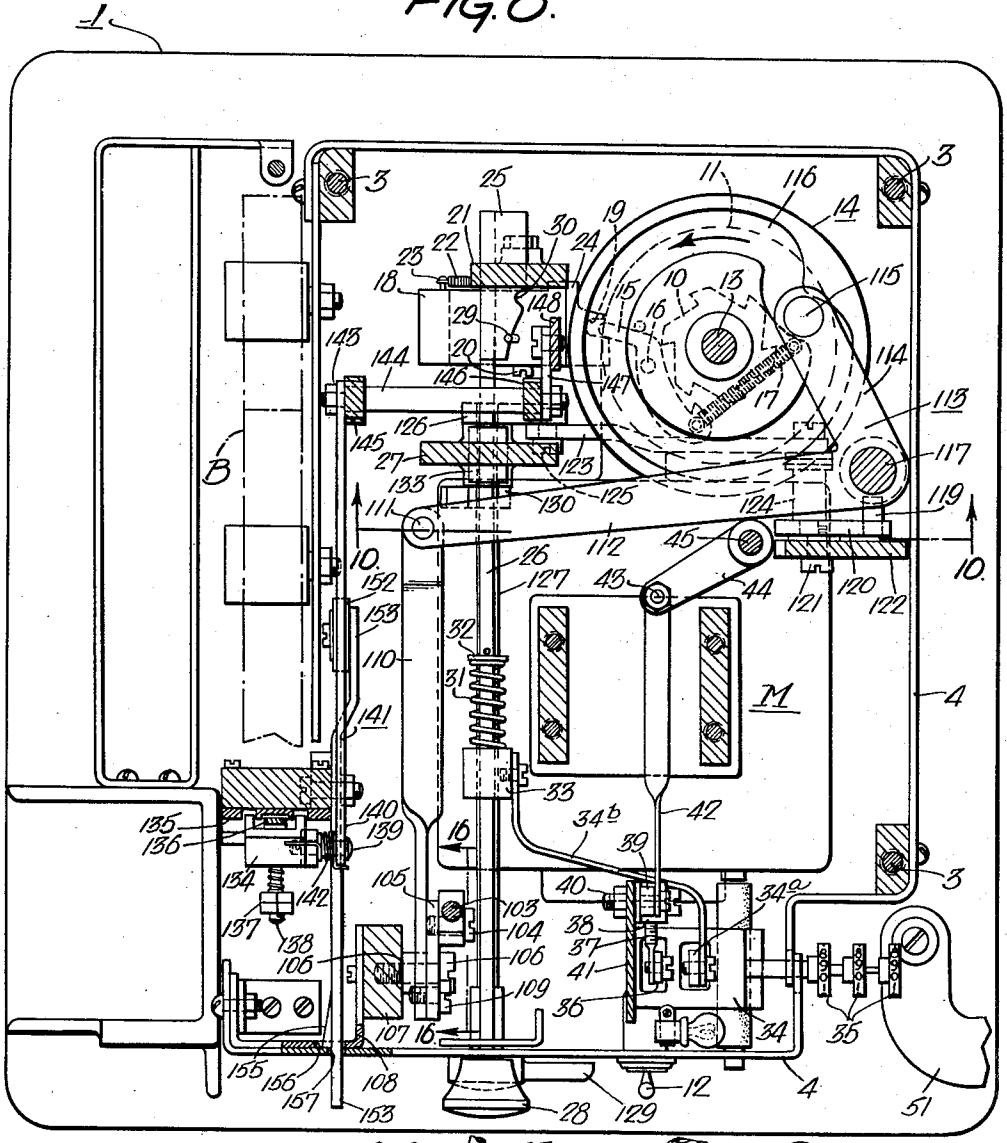
INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 6

FIG. 8.



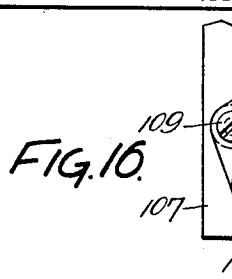


FIG. 16.

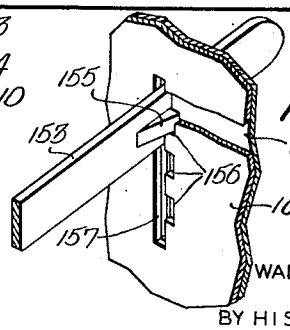


FIG. 17.

INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 7

FIG. 11.

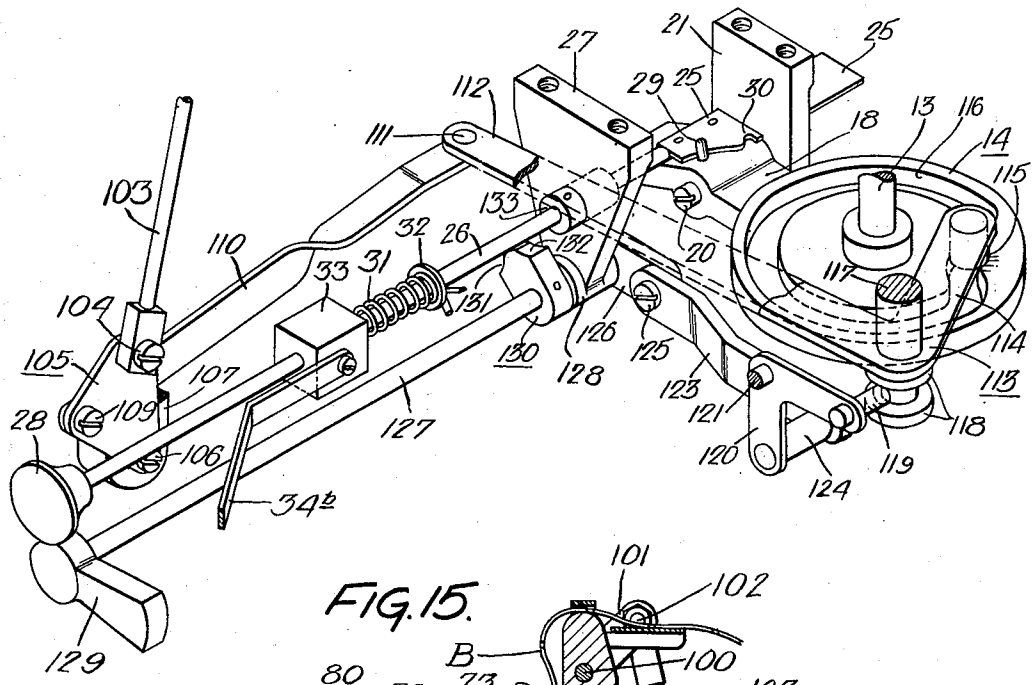
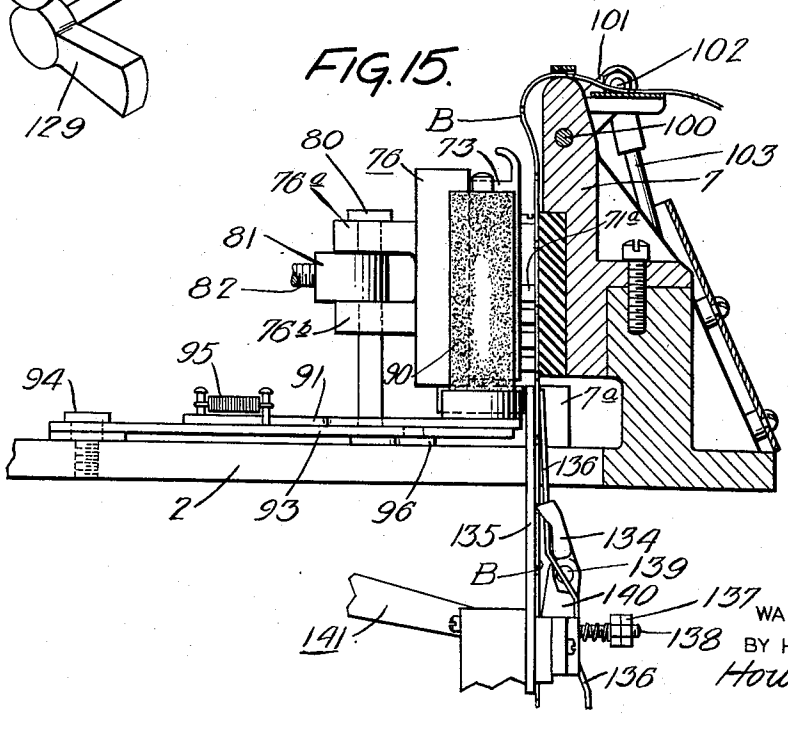


FIG. 15.



INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

May 22, 1951 W. M. HENRY 2,553,709

TICKET PRINTING MACHINE

Filed Sept. 20, 1948 8 Sheets-Sheet 8

FIG. 12.

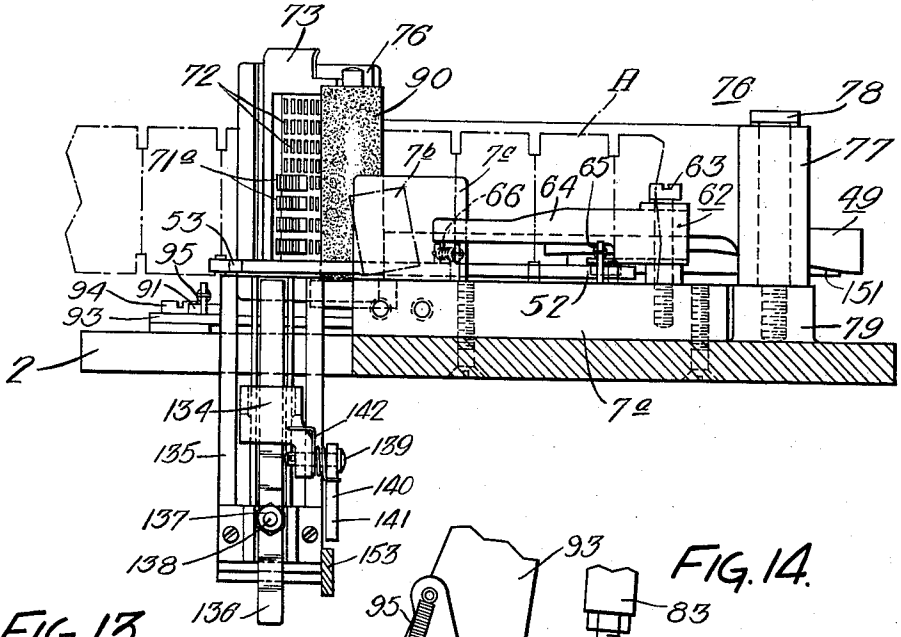


FIG. 13.

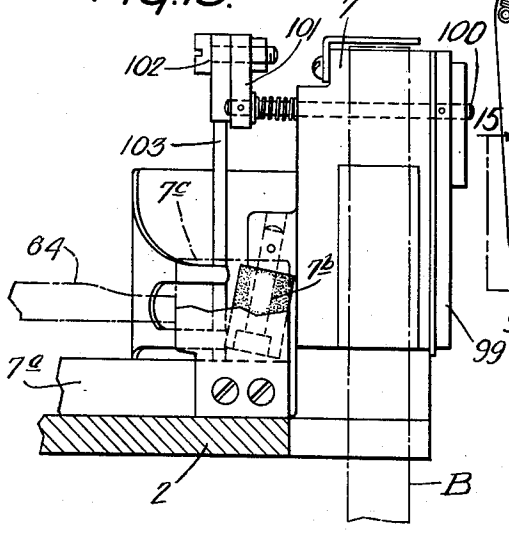
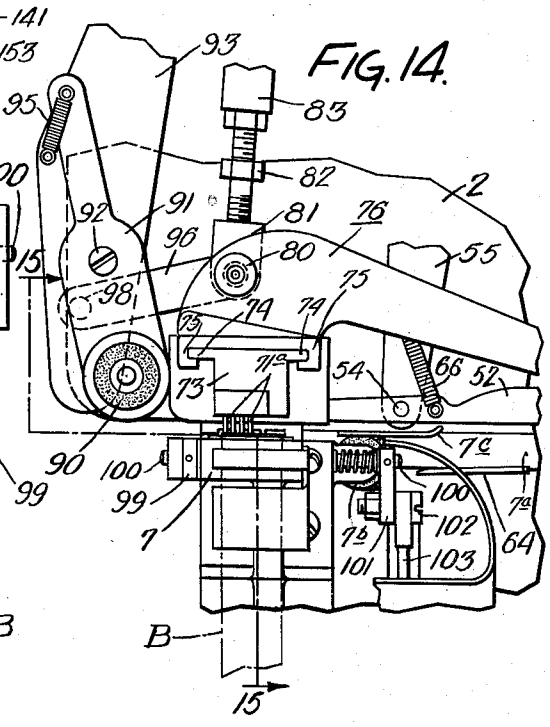


FIG. 14.



INVENTOR
WALTON M. HENRY
BY HIS ATTORNEYS
Howson & Howson

Patented May 22, 1951

2,553,709

UNITED STATES PATENT OFFICE

2,553,709

TICKET-PRINTING MACHINE

Walton M. Henry, Philadelphia, Pa., assignor to Soabar Company, Philadelphia, Pa., a corporation of Pennsylvania

Application September 20, 1948, Serial No. 50,042

11 Claims. (Cl. 101—288)

1

This invention relates to new and useful improvements in machines for printing the individual ticket portions of a continuously fed strip of tickets.

One object of the invention is to provide a ticket printing machine as set forth having an inking roll together with novel means operative in timed relation to movement of a type carrier for passing the inking roller in opposite directions over the printing type on the carrier between each successive printing contact thereof with the individual ticket portions of the strip.

Another object of the invention is to provide in a machine of the character set forth novel means for maintaining the ticket strip in a fixed course of travel so that the individual ticket portions thereof are positioned in proper register with a platen for printing.

Another object of the present invention is to provide a ticket printing machine as set forth embodying novel cut-off means for severing ticket portions from the strip after printing thereof together with control mechanism selectively operable to render said cut-off means inoperative during the printing of a predetermined number of ticket portions or to effect operation thereof in timed relation with each printing operation to sever each individual ticket portion from the strip after it is printed.

Another object of the invention is to provide in a machine of the stated character novel means for automatically locking the ticket cut-off control mechanism in the selected position thereof while the machine is in operation.

A further object of the invention is to provide a machine of the type described having novel means for feeding in one direction through the machine a strip of tickets to be printed together with means operable automatically to hold the feed means out of the way when no tickets are being fed in said direction so that said feed means will not interfere with the feed of a strip of tickets through the machine in another direction.

A further object of the invention is to provide a ticket printing machine having the aforesaid features and advantages which is of compact construction, is easy to use and is highly efficient and foolproof in operation.

These and other objects of the invention and the various features and details of the construction and operation thereof are hereinafter fully set forth and described with reference to the accompanying drawing, in which:

Fig. 1 is a front elevational view of a ticket printing machine made according to the present invention;

2

Fig. 2 is a top plan view of the machine;

Figs. 3 and 4, respectively, are side elevational views thereof;

Fig. 5 is an enlarged plan view of the machine with the top cover thereof removed;

Fig. 6 is a sectional view taken on line 6—6, Fig. 5;

Fig. 7 is a sectional view taken on the line 7—7, Fig. 5;

Fig. 8 is an enlarged sectional view taken on line 8—8, Fig. 1;

Fig. 9 is a fragmentary view in plan of the horizontal ticket strip feed means and associated mechanism in the inoperative position thereof;

Fig. 10 is a sectional view taken on line 10—10, Fig. 8;

Fig. 11 is a detached view in perspective showing certain structural details of the clutch control and cut-off knife actuating mechanisms of the machine;

Fig. 12 is a sectional view taken on line 12—12, Fig. 5;

Fig. 13 is a sectional view taken on line 13—13, Fig. 5;

Fig. 14 is a fragmentary view in plan showing the relative positions of the inking roller and type arm in the printing position of the latter in contrast to the other limit position of these elements shown in Fig. 5 of the drawings;

Fig. 15 is a sectional view taken on line 15—15, Fig. 14;

Fig. 16 is a view taken on line 16—16, Fig. 8; and

Fig. 17 is a fragmentary perspective view of means for varying the feed stroke of a strip of tickets vertically through the machine.

Referring now more particularly to the drawings, the illustrated embodiment of the invention comprises a base 1 above which a horizontal frame plate 2 is supported by uprights or standards 3. The mechanisms and operating parts of the machine located below the plate 2 normally are concealed from view by a lateral enclosing wall or casing 4 and those mounted above the plate 2 normally are concealed by a top cover section 5 which may be hinged as indicated at 6 to provide ready access to such parts.

According to the present invention, a strip of individual ticket or label portions to be printed is adapted to be actuated in step-by-step manner in confronting relation to the vertically disposed plane surface of a fixed platen 7 in a direction either horizontally or vertically through the machine, for example, as indicated in Figs. 12 and 15 of the drawings. As successive individual portions of the strips are positioned over the platen, a type carrying member is actuated toward the

ticket portions to print the desired matter thereon and between each succeeding printing operation the type carried by said member is suitably inked.

The operating parts of the machine are driven from a suitable electric motor M which drives a toothed clutch member 10 through a suitable gear reduction box 11. The circuit for supplying electric current to the motor M includes a conventional snap switch 12 for starting and stopping the motor. Rotatably journaled in the plate 2 of the machine is a shaft 13 which is disposed in coaxial alignment with the axis of rotation of the clutch member 10. At its lower end the shaft 13 carries a cam disk 14 to the underside of which a pawl 15 is pivoted as shown at 16. As shown in Fig. 8 of the drawings, one end of the pawl 15 is provided with a hook portion which is adapted for engagement with the teeth of the clutch disk 10, and a coil spring 17 connected between the hook end portion of the pawl 15 and the underside of the clutch disk 10 operates normally to urge the hook end of the pawl 15 into engagement with the teeth of the clutch disk 10. On the other hand, when the machine is idle the pawl 15 is held out of engagement with the clutch disk 10 against the bias of the spring 17 by means of a rocker arm 18 which is provided with a notch or recess 19 which receives the other end of the pawl, for example, as shown in Fig. 8.

With reference to Fig. 11 of the drawings, the rocker arm 18 is pivotally mounted upon a pin 20 which is carried by a depending bracket 21 secured to the underside of the plate 2. The rocker arm 18 normally is held in the position shown with its notch 19 disposed to receive the outer end of the pawl 15, by means of coil spring 22 which is connected between the remote end of the rocker arm 18, as indicated at 23, and a fixed part of the machine. By this arrangement the arm 18 is biased in the counterclockwise direction with respect to Fig. 11 and a projection 24 is provided at one side of the rocker arm 18 which is adapted to engage the underside of the bracket 21 and function as a stop to predeterminedly position the rocker arm 18 and its recess 19 to receive and retain the outer end of the pawl 15.

The rocker arm 18 is actuated in the clockwise direction with respect to Fig. 11 to release the pawl 15 from the clutch disk 10 by means of a cam plate 25 which is fixedly carried at the inner end of an axially slidable control rod 26. This rod 26 is slidably supported by the bracket 21 and has its outer end extending through a bracket at the front of the machine and provided with a suitable knob or the like 28 by means of which the control rod 26 may be manually actuated.

By this construction it will be observed that by pulling outwardly on the knob 28 the rod 26 is moved axially outward of the machine thus causing the cam plate 25 to cooperatively engage an upstanding pin 29 on the rocker arm 18. Engagement of the pin 29 by the cam plate 25 during outward movement of the rod 26 causes the rocker arm 18 to be actuated in the clockwise direction with respect to Fig. 11 until said pin 29 engages within a notch or recess 30 in the cam plate 25 where it is retained thus holding the control rod 26 in the outermost position to which it has been actuated and holding the rocker arm 18 in the clockwise position to which it has been actuated by the cam plate 25. Upon clockwise actuation of the rocker arm 18 as described the notch or recess 19 therein is disengaged from the outer or

tail end of the pawl end 15 thereby releasing the latter so that the spring 17 operates immediately to move the hook end of said pawl into engagement with one of the teeth of the clutch disk 10.

Engagement of the pawl 15 with the clutch disk 10 in the manner set forth establishes a driving connection from the disk 10 through the cam disk 14 to the shaft 13. Once this driving connection is established it remains unbroken until the control rod 26 is again actuated inwardly of the machine to cause the rocker arm 18 to move in the counterclockwise direction with respect to Fig. 11 under the influence of the spring 22 and thereby again position the rocker arm 18 so that its notch or recess 19 is disposed for engagement by the outer end of the pawl the next revolution of the disk 14 with the result that the hook end of the pawl is disengaged from the teeth of the clutch 10 against the bias of the spring 17. The control rod 26 normally is biased to its inward position by a spring 31 which surrounds a portion of the rod 26 and operates between a collar 32 carried thereby and a block 33 with respect to which the rod 26 is slidably mounted. In order to stop the machine immediately upon disengagement of the clutch, a friction brake device is provided which normally is spring urged into engagement with the peripheral surface of the disk 49 as shown in Fig. 5 of the drawings.

Inward actuation of the control rod 26 to disengage the pawl 15 from the clutch disk 10 of course may be done at any time. In addition, provision is made in the machine of the present invention for automatically disengaging the pawl 15 from the clutch disk 10 after a predetermined number of individual tickets have been printed. With reference to Fig. 8 of the drawings, a conventional type counting device 34 is mounted in the machine and provided with a plurality of manually operable dials 35 secured respectively upon concentrically arranged shafts which project laterally outward of the machine casing as shown. These dials 35 are each numbered consecutively from 0 to 9 so that by individually adjusting each of them the counting device 34 may be set to print any desired number of tickets up to, for example, 999 in the particular printing machine illustrated.

The counting device 34 is actuated in the usual manner by effecting back and forth movement of an arm 36 which projects from said counting device. Pivotally connected to the outer end of this arm 36 is a rod 37 which is adjustably connected to a block 38. The block 38 is pivotally connected to the lower end of a link 39 which is pivoted at 40 to a fixed part 41 of the machine, and pivotally connected to the upper end of the link 39 is a lever 42 which extends horizontally inward of the machine and has its inner end pivotally connected as at 43 to the outer end of a link 44 that is fixedly mounted upon a vertically extending shaft 45. The shaft 45 is rotatably journaled in the frame plate 2 and projects a predetermined distance above the latter, for example, as shown in Fig. 7 of the drawings. An arm 46 has one end thereof fixedly mounted upon the shaft 45 and the other end of the said arm 46 carries a follower 47 which is adapted to ride in a cam groove 48 provided in the under surface of a disk 49 that is fixedly mounted upon the shaft 13 and adapted to be rotationally driven thereby from the motor M through the gear reduction box 11 and the clutch mechanism previously described. The contour of the cam groove 48 is such that the arm 46 will be actuated to rotate

the shaft 45 and thereby impart reciprocable movement to the link 44, lever 42, link 39 and rod 37 to cause the lever 36 to be actuated to operate the counting device 34 once for each revolution of the disk 49 and the shaft 13. As stated above the counting device 34 may be set to cause the machine to feed and print a predetermined number of tickets and the construction of the counting device is such that when the number of operations of the machine for which the counting device 34 has been set is completed an arm 34*a* of the counter device is actuated. Connected to this arm is one end of a lever 34*b* which has its other end connected to the block 33 on the control rod 26. Actuation of the counting device arm 34*a* as described causes the lever 34*b* to be actuated inwardly to move the control rod 26 inwardly against the force of the spring 31 thus disengaging the pin 29 and notch 30 and moving the cam plate 25 relative to said pin so that the rocker arm is caused to move in the clockwise direction and effect disengagement of the pawl 15 from the clutch disk 10 in the manner previously described.

As previously set forth, a strip of tickets is adapted to be advanced horizontally through the machine in step-by-step manner to position the individual ticket portions thereof successively in confronting relation to the fixed platen 7 to be printed. To this end a strip A of individual ticket portions in roll form is supported upon a spider 50 which in turn is rotatably supported at the outer end of an arm 51 which is mounted upon the base 1 of the machine and inclines laterally outward therefrom, for example, as shown in Figs. 1 and 2 of the drawings. As shown more clearly in Fig. 5 the ticket strip A leads laterally from the roll on the spider 50 and passes horizontally through the machine behind the fixed platen 7. The arm 51 is provided with a laterally facing bushing 51*a* so that the spider 50 may be mounted in the vertical position shown in broken lines in Figs. 1 and 2 for rewinding a printed ticket strip into a roll.

Step-by-step advance of the strip A to position the individual ticket portions thereof successively in front of the platen 7 is accomplished by an elongated pusher element 52 having an outwardly projecting finger 53 adjacent one end thereof which is adapted intermittently to engage the strip A and advance the same the length of one individual ticket portion of the strip. With reference to Fig. 5, the pusher element 52 is pivotally mounted intermediate its ends, as at 54, to the outer end of arm 55 which has its other end pivoted, as at 56, to the frame plate 2 of the machine. Pivotally connected at 57 to the arm 55 intermediate the ends of the latter is a lever 58 and to this lever 58 there is pivotally connected a link 59 which in turn has one end fixedly mounted upon the aforesaid shaft 45. The pusher 52, arm 55, lever 58 and link 59 are constructed and arranged so that once during each revolution of the disk 49 the cam groove 48 actuates the arm 46 and shaft 45 to cause the pusher 52 to be reciprocated in the general direction of the arrows (Fig. 5) to engage and advance through the machine one individual ticket portion of the strip A into printing position in front of the fixed platen 7.

A convex cam portion 60 is provided upon the opposite end portion 52 from the finger 53. Cooperating with this convex cam edge 60 of the pusher 52 is a cam roller 61 carried by a bracket 62 which is pivotally mounted to a fixed part of the machine at 63 and includes an elongated finger portion 64 that normally is engaged against the inner side of the ticket strip A as it advances through the machine, for example, as shown in Fig. 5 of the drawing. The bracket 62 and its associated finger 64 normally are biased in the counterclockwise direction with respect to Fig. 5 by means of a spring 65 which is connected between the brackets 62 and a fixed part of the machine.

As the ticket strip A is fed horizontally through the machine the lower edges of the vertically disposed ticket portions traverse a guide plate 7*a* which terminates adjacent the fixed platen 7 and is vertically disposed with respect thereto so that the ticket portions are properly positioned vertically with respect to said platen 7. In order to maintain the lower edge of the ticket portions of the strip in contact with this guide 7*a* and thereby eliminate any tendency for the ticket strip to work vertically upward in the machine and thus improperly position the tickets with respect to the fixed platen 7, there is provided adjacent the feed side of the latter a resilient roller 7*b*. This roller 7*b* is arranged to contact the advancing ticket strip A at the outer side thereof and the roller 7*b* has its axis of rotation inclined in the direction of the fixed platen 7 as shown in Figs. 12 and 13 of the drawings so as to exert a continuous downward thrust on the ticket strip A thereby maintaining it at all times upon the guide plate 7*a* as described. A backing member 7*c* is provided at the inner side of the ticket strip A and serves to support the latter against the roller 7*b*.

As previously pointed out, the bracket 62 and finger 64 are biased in the counterclockwise direction by the spring 65 and hence when passage of the ticket strip A through the machine has been completed or when the ticket strip A is removed from the machine for any reason, the finger 64 will be released and the spring 65 will actuate the bracket 62 and finger 64 into the position shown in Fig. 9 of the drawings so that the roller 61 acts on the cam edge 60 to move the pusher element 52 in the clockwise direction sufficiently to space its finger 53 away from the platen 7 so as not to interfere with the passage of a strip of tickets, for example, vertically through the machine as more particularly hereinafter described.

It will be obvious, of course, that the individual ticket portions of the strip A will vary in length and in order to insure that the pusher element 52 may be operated to advance strips of ticket portions of different size through the machine, provision is made for adjusting the length of stroke of the pusher element 52 as may be required. To this end the pivotal connection of the lever 58 to the arm 55 may be adjustably positioned with respect to the arm 55 by providing therein a plurality of openings 67 for selective positioning of the pivot 57. In addition, the link 59 is slotted as indicated at 68, to provide a sliding connection with the lever 58 through the medium of a pin 69 and said link also is provided with a plurality of openings 70 in which the pivot pin 59 may be selectively engaged. A spring 71 is associated with the pin 69 to permit relative vertical displacement of the lever 58 and link 59 to permit of selective engagement of the pivot pin 59*a* in the openings 70.

By the construction described, with the proper setting of the pivots 57 and 59*a* it will be observed that once during each revolution of the

disk 49 the cam groove 48 will actuate the arm 46 and in turn the link 59, lever 58 and arm 55 to reciprocate the pusher element 52 and advance the ticket strip A through the machine a distance equal to the length of one individual ticket portion thereof so that the ticket portions are positioned successively in front of the fixed platen 7 to be printed.

Printing of each individual ticket portion is accomplished by bringing one or more type pieces 71*a* into contact with the individual ticket portion of the strip A which is positioned in front of the platen 7. The type 71*a* is mounted in suitable recesses 72 in the face of a type block 73 having lateral flange portions 74 which are slidably received in the undercut portions 75 provided at one end of a type carrier member 76. The type carrier 76 is configurated as shown in Fig. 5 of the drawings and includes a pair of relatively spaced elongated arm portions 76*a* and 76*b* which terminate at their outer ends in a bushing 77 which is pivotally mounted to the fixed plate 2 of the machine by a bolt 78 that is threaded into the tapped opening of a boss 79 on said plate 2.

Periodic actuation of the carrier 76 about its pivot 78 to move the type 71*a* into contact with the ticket portion positioned in front of the platen 7 is effected in timed relation with the advance of the ticket strip A through the machine so that each individual ticket portion that is positioned in front of the platen 7 by the pusher element 52 will be printed with the desired characters. In the present instance, this is accomplished by providing in the arm portions 76*a* and 76*b* of the carrier 76 a pin 80 on which is pivoted a block 81. The block 81 is adjustably connected to a similar block 82 by means of a dual pitch threaded bolt 83, and the block 82 is pivotally mounted upon a pin 84 between the spaced arm portions of a yoke 85 which is pivoted to an upstanding boss 86 on the fixed plate 2 of the machine by means of bolt 87.

Also pivotally mounted on the pin 84 is one end of a link 88 which is at its other end pivotally connected to a disk 49 eccentrically of the axis of rotation thereof by means of a screw 89. The link 88, yoke 85 and the adjustable connections 81, 82 and 83, as well as the pivots 84, 87 and 89, are constructed and relatively arranged so that each revolution of the disk 49 operates through these members to actuate the type carrier 76 about its pivot 78 in the direction of the platen 7 to cause the type elements 71*a* to be moved into printing contact with each successive individual ticket portion advanced by the pusher element 52 in the manner previously described.

It is desirable in a machine of the present character that the type elements 71*a* be properly inked between each printing contact thereof with a ticket portion of the strip A. For this purpose an inking roller 90 is provided and is adapted to be moved in rolling contact in opposite directions across the face of the type pieces 71*a* between successive printing operations. In the present instance this is accomplished by rotatably mounting the inking roll 90 upon the outer end of a lever 91 which in turn is pivotally mounted intermediate its ends as at 92 adjacent one end of an arm 93 that has its other end pivoted to the fixed plate 2 of the machine at 94. The lever 91 is normally urged in the counterclockwise direction with respect to the arm 93 by means of a spring 95 which is operatively connected between said arm 93 and the inner end of the lever 91. Actuation of the arm 93 in timed relation to move the type carrier 76 in order to move the inking roller 90 back and forth across the type pieces 71*a* is accomplished by means of a link 96 which is pivotally connected at one of its ends to the lower end of the pin 80 and at its other end to the said arm 93, for example, as indicated at 97 and 98, respectively. The link 96, arm 93 and lever 91 and their respective pivotal connections are constructed and relatively arranged so that after each printing actuation of the carrier 76 as the latter moves into the position shown in Fig. 5, the inking roller 90 is caused to move from the position shown in Fig. 14 of the drawings across the face of the carrier 76 to the position shown in Fig. 5 and then back again to the position shown in Fig. 14. During this movement of the inking roller 90 the spring 95 urges the same continuously in the counterclockwise direction, thus insuring rolling contact of the roller 90 in two directions over the faces of the type pieces 71*a*.

After each individual ticket portion is printed and the pusher element 52 has operated to advance the strip to position the succeeding ticket portion for printing, it may be desirable to sever each ticket portion from the strip. In accordance with the present invention this is accomplished by providing a suitable knife 99 adjacent the ticket discharge side of the fixed platen 7. This knife 99 is fixed on a shaft 100 which is rotatably mounted adjacent the upper end of the platen 7 and has fixedly mounted on the other end thereof a link 101 that has its other end in turn pivotally connected at 102 to the upper end of an actuator rod 103. At its lower end the rod 103 is pivotally connected as indicated at 104 to the one corner of a triangular plate 105 which in turn is pivotally mounted at 106 to a boss 107 on the dome plate 2. Pivotally connected to the plate 105 at the third corner thereof, for example, as indicated at 109, is the outer end of a lever 110 which has its inner end pivotally connected at 111 to the relatively longer arm 112 of a bell crank lever 113. The shorter arm 114 of the bellcrank 113 carries a follower 115 at its free end which is adapted to engage a cam groove 116 formed in the upper face of the disk 14 on the lower end of the driven shaft 13 of the machine.

At the junction of its arms 112 and 114 the bellcrank lever 113 is pivotally mounted upon a stud 117 which is supported for vertical sliding movement in the fixed plate 2 of the machine. On the lower end of this stud 117 and below the bellcrank 113 there are secured relatively spaced collars 118 which, in conjunction with a reduced diameter portion of the stud 117, provide an annular groove or recess for the reception of a pin 119 which is carried by a bellcrank 120 and adapted to be actuated vertically with respect to the machine to thereby raise and lower the stud 117 and bellcrank 113 in order to engage and disengage the follower 115 with respect to the cam groove 116. The bellcrank 120 is pivotally mounted as indicated at 121 to a bracket 122 that is secured to the underside of the plate 2 of the machine, for example, as shown in Figs. 7, 8 and 10 of the drawings.

Actuation of the bellcrank 120 about its pivot 121 to engage and disengage the follower 115 with the cam groove 116 as described, is accomplished in the present instance by a link 123 which has one of its ends pivotally connected by a pin 124 to the other arm of the bellcrank 120 and has its other end pivotally connected as indicated at 125 to a radial arm 126 which is fixed-

ly mounted upon the inner end of a cut-off knife control shaft 127. The shaft 127 is rotatably supported in a bushing 128 provided at the lower end of the bracket 27 which depends from the underside of the fixed plate 2 and extends forwardly through the front of the machine as shown in the drawings, being provided with a suitable operating handle 129.

From the construction described it will be observed that upon the actuation of the handle 129 and shaft 127 in the clockwise direction with respect to Fig. 11 of the drawings, the corresponding movement is imparted to the radial arm 126 which operates through the link 123 to rotate the bellcrank 120 in the clockwise direction about its pivot 121 thus moving the pin 119 downwardly. Downward movement of the pin 119 carries with it the stud 117 and bellcrank lever 113 with the result that the follower 115 is caused to engage in the cam groove 116 provided in the disk 14. The cam groove 116 is configurated and contoured so that once during each revolution of the disk 14 the bellcrank lever 113 will be oscillated about the stud 117 to cause reciprocatory movement of the lever 110 and rod 103 and actuate the knife 99 in the counterclockwise direction from its inoperative position shown in broken lines in Fig. 6 to the solid line position to sever the projecting last printed ticket portion from the strip A.

As previously stated it may be desired to sever the individual ticket portions successively from the strip A as they are printed and moved out of printing position. Conversely, it may be desired not to sever the tickets as they are printed but to leave the printed tickets in strip form until a predetermined number have been printed as determined by the settings of the dials 35 of the counting device 34. In the present invention, this selective operation of the cutting knife 99 is accomplished by providing on the shaft 127 latch member 130 having concave portions 131 and 132, respectively, disposed for cooperative engagement with a collar 133 on the clutch control rod 26 when the latter is pulled out by the knob 28 to effect engagement of the pawl 15 with the clutch disk 10 in the manner previously described.

Thus, if it is desired to sever the individual ticket portions from the strip A as they are printed, the handle 129 on the shaft 127 is actuated in the clockwise direction with respect to Fig. 11 to engage the follower 115 and the cam groove 116 prior to pulling out the clutch control rod 26. After engagement of the follower 115 with the cam groove 116, the control rod 26 is pulled outwardly thus engaging the collar 133 thereon with the arcuate recess 131 of the latch member 130 to lock the knife control mechanism in the position to which actuated during the period that the clutch remains in engagement so that the knife 99 will operate once each revolution of the disk 14 to sever the successive printed tickets from the strip A.

On the other hand, if it is not desired to sever the individual ticket portions as they are printed, the knife control handle 99 and its associated mechanism may be allowed to remain in the relative position as shown in the drawing. In this position, when the clutch control rod 26 is pulled out as described, the collar 133 will be engaged with the arcuate recess 132 of the latch member 130 to lock the mechanism in position with the follower 115 out of engagement with the cam groove 116 so that the knife 99 remains inoperative.

As previously stated, in addition to the horizontal feed ticket strip A, provision is made in the machine of the present invention for feeding a strip of tickets vertically upward through the machine so that the individual ticket portions of the strip are disposed successively in front of the fixed platen 7 to be printed by the type 71a on the carrier 75 precisely in the manner previously described. In the present machine, this is accomplished by providing mechanism for feeding a ticket strip B upwardly through the machine in the relation shown, for example, in Figs. 6 and 15, in timed relation to reciprocation of the type carrier 76.

With reference to Figs. 6, 8 and 15 of the drawings, the ticket strip B is fed step-by-step upwardly over the fixed platen 7 by means of a pusher plate 134 which is reciprocated in a generally vertical direction, first downwardly out of engagement with the ticket strip B, and then upwardly in engagement with the ticket strip B so as to carry the latter upwardly with it. A backing plate 135 is provided over which the ticket strip B travels and the strip normally is maintained against the backing plate 135 by means of a resilient finger or spring 136, the tension or pressure of which may be varied by adjustment of nuts 137 on the screw 138.

The pusher plate 134 is pivotally mounted upon a pin 139 carried at the forward upwardly projected end portion 140 of a generally J-shaped lever 141 and normally is biased to engage the ticket strip B by a spring 142 which is wound around the pin 139 and has its opposite end portions disposed cooperatively to engage the pusher plate 134 and end portion 140 of the lever 141, for example, as shown in Fig. 12 of the drawing. The lever 141 has its inner end fixedly secured, as indicated at 143, upon one end of a shaft 144 which is rotatably supported in depending brackets 145 and 146 at the underside of the fixed frame plate 2. The other end of the shaft 144 has fixed thereon one end of a link 147 which has its other end pivotally connected to the lower end of a vertical link 148. The link 148 is arranged for movement vertically through a slot 149 in the frame plate 2 and carried at the upper end thereof is a roller 150 which is adapted to engage a cam surface 151 provided at the underside of the cam disk 49.

The construction and arrangement of the lever 141 and link 147 are such that upon vertical actuation of the link 148 effected by the cam 151, the said lever 141 will be actuated once during each revolution of the cam disk 49 in the counterclockwise direction with respect to Fig. 6 to cause the pusher plate 134 to move the ticket strip B upwardly a distance equal to the length of an individual ticket portion of the strip. In its mid-portion the lever 141 is adapted to rest upon a roller 152 which is rotatably carried at the inner end of a lever 153. This roller 152 acts as a rest or stop to fix the lower limit of reciprocation of the pusher plate 134, and it will be observed that by varying the position of the roller 152 vertically, with respect to Fig. 6, the length of the stroke of the pusher plate 134 may be varied as required to advance individual ticket portions of different length upwardly through the machine. In the present instance, adjustment of the position of the roller 152 for the purpose described is accomplished by slidably and pivotally mounting the lever 153 through the medium of a pin and slot connection 154 whereby a laterally projecting lug 155 on the lever 153 may be selectively

engaged with any one of a plurality of vertically spaced notches or recesses 156 arranged at one side of a slot 157 in a bracket 108 which is adjustably mounted on the boss 107, adjustment of said bracket being provided to permit variation in the vertical positioning of the notches 156 therein.

From the foregoing description it will be observed that the present invention provides a ticket printing machine having an inking roll which is moved in opposite directions over the type pieces between each successive printing contact thereof with the individual ticket portions of a strip. The invention also provides a machine having novel means for maintaining the ticket strip in a fixed course of travel so that the individual ticket portions thereof are positioned in proper register with a platen for printing. Furthermore, the present invention provides a ticket printing machine embodying novel cut-off mechanism which may be selectively controlled to render the same inoperative during operation of the machine or to render it operative to sever each individual ticket portion from the strip after it is printed. In addition, the present invention provides a ticket printing machine having the aforesaid features and advantages which is of compact construction, is easy to use and is highly efficient and foolproof in operation.

While a particular embodiment of the invention has been illustrated and described herein, it is not intended to limit the invention to the disclosed embodiment, and changes and modifications may be made within the scope of the following claims.

I claim:

1. In a machine for printing a succession of individual ticket portions in strip form including a support for said tickets and mechanism for advancing said strip step-by-step through the machine to position said individual ticket portions successively in confronting relation to said support, knife means pivotally mounted adjacent said support operable to sever the strip, and actuating means for said knife operative in timed relation to said strip advancing mechanism to actuate the knife after each operation of said strip advancing mechanism and sever the last printed ticket portion from the strip, control means selectively operable to render said knife inoperative to sever successively printed tickets from said strip, drive means for said strip advancing mechanism and several actuating means including a clutch operable to effect starting and stopping of the machine, other control means operable to engage and disengage said clutch, and latch means positionable by said knife control means for engagement by an element on said clutch control means in the clutch engaging position thereof to lock the knife control means in a preselected position while the clutch is engaged and the machine in operation.

2. A machine as claimed in claim 1 wherein the clutch control means comprises a rod member axially shiftable between clutch engaged and disengaged positions and the knife control means comprises a rotationally shiftable rod member.

3. A machine as claimed in claim 1 wherein the latch means is carried by the knife control means and is provided with recessed portions and the element on the clutch control means comprises a collar arranged in the clutch engaged position of the clutch control means to engage one of the recesses in said latch means to lock the knife control means in position.

4. In a machine for printing a succession of individual ticket portions in strip form including a support for said tickets and mechanism for advancing said strip step-by-step through the machine to position said ticket portions successively in confronting relation to said support, knife means pivotally mounted adjacent said support operable to sever the strip, actuating means for said knife operative in timed relation to said strip advancing mechanism to actuate the knife after each operation of said strip advancing mechanism and sever the last printed ticket portion from the strip, control means selectively operable to render said knife inoperative to sever successively printed tickets from said strip, drive means for said strip advancing mechanism and several actuating means including a clutch operable to effect starting and stopping of the machine, other control means operable to engage and disengage said clutch, and latch means positionable by said knife control means for engagement by an element on said clutch control means in the clutch engaging position thereof to lock the knife control means in a preselected position while the clutch is engaged and the machine in operation.

5. In a machine for printing a succession of individual ticket portions in strip form including a support for said tickets and mechanism for advancing said strip step-by-step through the machine to position said ticket portions successively in confronting relation to said support, a type carrier pivotally mounted in said machine and movable toward and away from the support to convey type into printing contact with a ticket portion, knife means pivotally mounted adjacent said support operable to sever the strip, actuating means for said knife operative in timed relation to said strip advancing mechanism to actuate the knife after each operation of said strip advancing mechanism and sever the last printed ticket portion from the strip, control means selectively operable to render said knife inoperative to sever successively printed tickets from said strip, drive means for said strip advancing mechanism and several actuating means including a clutch operable to effect starting and stopping of the machine, and latch means on said knife control means positionable thereby for engagement by an element on said clutch control means in the clutch engaging position thereof to lock the knife control means in a preselected position while the clutch is engaged and the machine in operation.

6. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancing a first strip of tickets through the machine in one direction with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, control means engaged by said first strip, mechanism for advancing a second strip of tickets through the machine in another direction with respect to said platen, drive means for said strip advancing mechanisms, and means acting on said control means in opposition to said first strip operable upon removal of the first strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen so as not to interfere with advancement of the second ticket strip through the machine.

7. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancing a first strip of disposed tickets horizontally through the machine with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, control means engaged by said first strip, a roller mounted adjacent said platen for rotation about an axis inclined in the direction of the platen at an angle to the perpendicular and arranged to engage said strip and exert a continuous downward thrust thereon to prevent the same from riding vertically upward relative to the platen, mechanism for advancing a second strip of tickets through the machine in another direction with respect to said platen, and means acting on said control means in opposition to said first strip and operable upon removal of the first strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen so as not to interfere with advancement of the second ticket strip through the machine.

8. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancing a first strip of tickets horizontally through the machine with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, spring means biasing said element normally to engage said strip, control means engaged by said first strip, mechanism for advancing a second strip of tickets through the machine in another direction with respect to said platen, drive means for said strip advancing mechanisms, and other spring means acting on said control means in opposition to said first strip and the first mentioned spring means, said other spring means being operable upon removal of the first strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen so as not to interfere with advancement of the second ticket strip through the machine.

9. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancing a first strip of tickets horizontally through the machine with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, spring means biasing said element normally to engage said strip, control means engaged by said first strip, a roller mounted adjacent said platen for rotation about an axis inclined in the direction of the platen at an angle to the perpendicular and arranged to engage said strip and exert a continuous downward thrust thereon to prevent

the same from riding vertically upward relative to the platen, mechanism for advancing a second strip of tickets through the machine in another direction with respect to said platen, drive means for said strip advancing mechanisms, and other spring means acting on said control means in opposition to said first strip and the first mentioned spring means, said other spring means being operable upon removal of the first strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen so as not to interfere with advancement of the second ticket strip through the machine.

10. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancing a strip of tickets through the machine in one direction with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, control means engaged by said strip, and means acting on said control means in opposition to said strip operable upon removal of the strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen.

11. In a machine for printing a succession of individual ticket portions in strip form including a platen having a surface for supporting said tickets in printing position, mechanism for advancng a strip of tickets through the machine in one direction with respect to said platen and including a reciprocable pusher element arranged during movement thereof in one direction to engage and advance said strip, spring means biasing said element normally to engage said strip, control means engaged by said strip, and other spring means acting on said control means in opposition to said first strip and the first mentioned spring means, said other spring means being operable upon removal of the strip from engagement with said control means to actuate the latter and in turn position the pusher element away from the platen.

WALTON M. HENRY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,111,020	Hoefer	Sept. 22, 1914
1,526,979	Henry	Feb. 17, 1925
1,655,999	Henry	Jan. 10, 1928
1,814,923	Henry	July 14, 1931
1,879,233	Henry	Sept. 27, 1932
1,889,250	Kohnle	Nov. 29, 1932
2,012,130	Kellogg	Aug. 20, 1935
2,103,654	Weimont et al.	Dec. 28, 1937
2,104,647	Henry	Jan. 4, 1938
2,313,347	Kohnle	Mar. 9, 1943
2,328,934	Turner	Sept. 7, 1943