

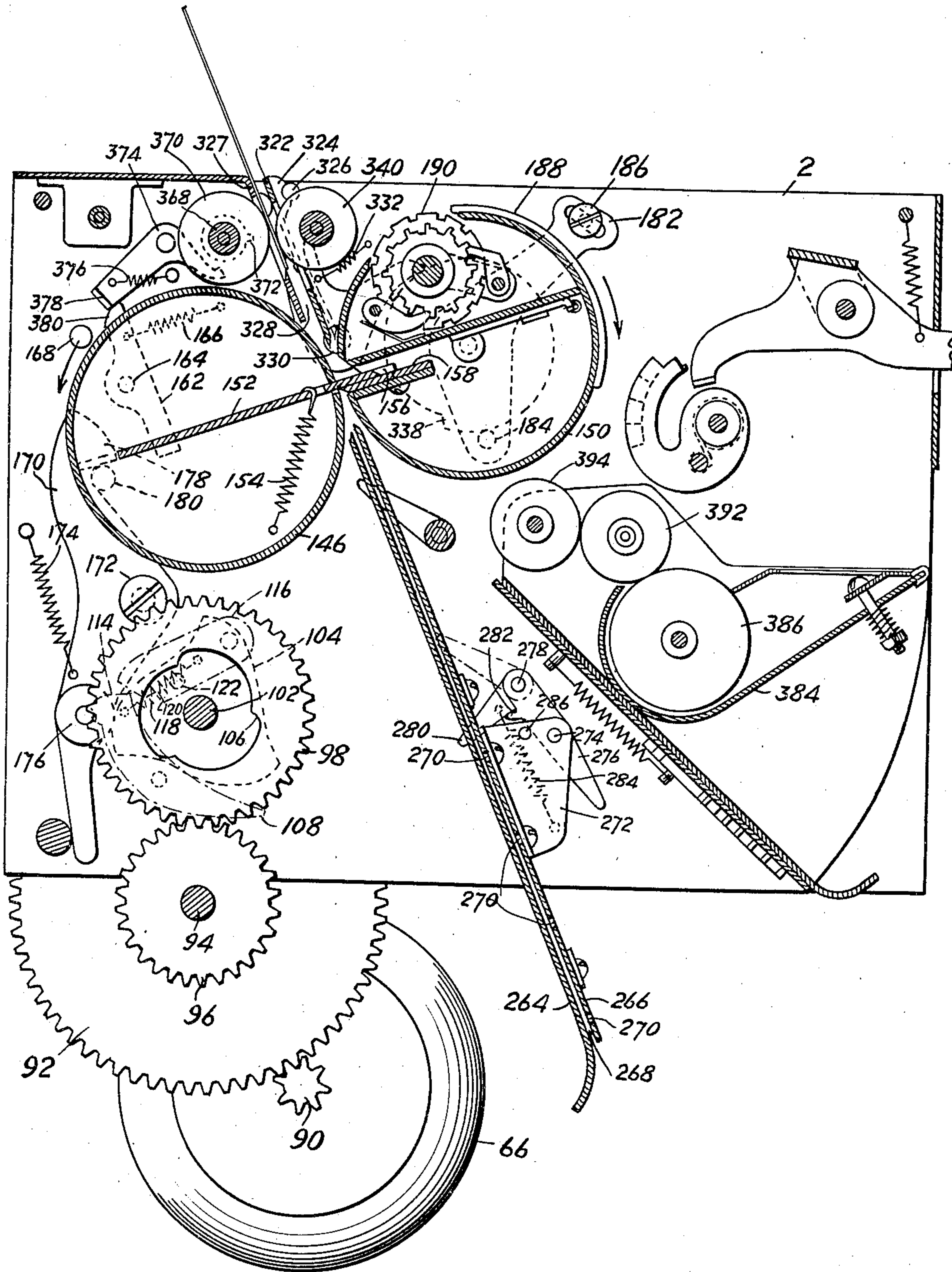
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TICKET ISSUING MACHINE

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WITNESS:

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## UNITED STATES PATENT OFFICE

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## TICKET ISSUING MACHINE

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4 Claims. (Cl. 101—227)

This invention relates to ticket issuing machines and, more particularly, to machines for issuing tickets or checks for theaters, restaurants, amusements, railways, buses and the like.

5 This application is a division of my application Serial No. 665,386, filed April 10, 1933, upon which Patent No. 2,097,485 was granted on Nov. 2, 1937 and which is in turn, in part, a continuation of my application Serial No. 620,091, filed June 30, 10 1932 upon which Patent No. 2,041,831 was granted on May 26, 1936.

This divisional application relates primarily to the devices for handling the ticket strip for printing, severance and discharge. One object of the 15 invention is to provide means for insuring the proper alignment of a ticket strip when severance thereof occurs.

20 Ticket issuing machines are generally subject to much abuse, particularly in the nature of failure to keep the mechanism properly clean and free from the lint and dust resulting from the severance of ticket stock for the issuance of individual tickets. As a result of the fact that certain parts may become choked by dirt accumulated by reason of neglect, it is undesirable to leave important operations of the machine to the efficacy of springs. This is particularly true of the severing device for cutting the ticket strip to issue separate tickets or strips thereof. In the 25 present mechanism positive means are provided for moving the severing device positively in both its operating and retracting movements. The mechanism for accomplishing this is such as to properly operate a moving knife, although the 30 knife is carried within a rotating cylinder.

In connection with the severing means, there is provided an arrangement which, in accordance with a further object of the invention, may be readily changed to secure the severance of a strip, 40 so that either individual tickets may be issued or a plurality of tickets may be issued in the form of a strip.

45 Still another object of the invention is concerned with the provision of elements whereby the tickets are ejected from the machine with sufficient velocity to carry them freely upon the top plate of the housing, so that they may be picked up by a purchaser, who need not pull them 50 from the machine. The mechanism for doing this, however, is subject to modification, so that, when the machine is transferred into the type adapted to issue, say, restaurant checks whenever one is removed, the tickets will not be ejected, 55 but will remain held so as to control a device for

automatically starting the machine when the presented check is removed.

In conjunction with the aligning device which insures that cutting of the ticket strip takes place in proper fashion and also insures that printing 5 is accomplished on a partially printed ticket in proper relationship to the printing already thereon, means are provided, in accordance with the present invention, for making adjustments for the proper handling of various sizes of stock and 10 also for the issuance of different sizes of tickets. Adjustable lateral guides serve to secure a proper positioning of stocks of varying widths, while the adjustment of the longitudinal aligning means provides for the issuance of tickets of varying 15 lengths or the issuance of double tickets where, for example, it is necessary to issue not only a single ticket, but also one or more coupons. In such cases, the machine is readily adapted by a change of the printing cylinder to number such 20 movable tickets a plurality of times or print thereon a plurality of indications of the time of issue or the like.

Only the above objects of the invention are enumerated because they are related to the sub- 25 ject-matter of this divisional application. Reference may be made to the parent application for a more complete indication of the objects of the invention, and also for details of construction. The subject-matter to which this divisional ap- 30 plication relates will become apparent from the following description read in conjunction with the accompanying drawing, in which the figure is a vertical section of a unit taken transversely to the driving shaft and showing the parts primarily in- 35 volved in the handling and severing of the ticket strip.

The reference characters used on the drawing are the same as those used in the parent appli- 40 cation, to which reference may be made for other details of the machine.

The various elements of each unit are supported by suitable frame plates, indicated at 2. The units are adapted to be set into operation to issue one or more tickets, either by withdrawal 45 of a ticket or by the manipulation of suitable keys which determine the number of tickets to be issued and also serve to energize a driving motor. A motor 66, common to a plurality of units, is provided with a pinion 90 engaging a gear 50 92 fixed to a shaft 94 to which are secured a plurality of pinions 96, one corresponding to each of the associated units. Each of the units contains a gear 98 which may be dropped into mesh with the corresponding gear 96 when the units are 55



placed in position in their common housing. The location of the units in their common housing also completes electrical connections so that control of the motor from any unit may be effected.

5 The gear 98 of each unit is secured to a hub journalled upon a fixed shaft 102 carried by the side plates of the frame. This hub carries a cam 104, the purpose of which will be hereafter described. When the machine is in stationary condition, the gear 98 is not clutched with the mechanism of the unit. Accordingly, even if the gear 10 98 of an inactive unit is rotated by reason of the operation of another unit, this rotation takes place idly, the cam 104 being at this time out of engagement with any follower, as will be evident hereafter. The gear 98 may be clutched to drive the mechanism by the devices indicated in the drawing. The face of the gear 98 is provided with a clutch member having a cam-like internal surface provided with sockets, indicated at 106. To 20 insure more immediate clutching and more rapid starting of the machine, a plurality of sockets are preferably provided, this number being, in the present instance three, so that the gear 98 need make no more than one-third of a revolution prior to engagement of the clutch. A second hub journalled on the fixed shaft 102 carries a plate on which is pivoted a lever 108, having a head 114 engageable with a cam surface formed at the end of a lever 116, also pivoted to the plate. 30 A spring 118 normally urges the head 114 of the lever 108 in such direction as to tend to cam the lever 116 outwardly and thereby cause the pin 122, carried by the lever 116, to engage within one of the sockets 106. The spring 118 is sufficiently strong to accomplish this whenever the lever 108 is free to move in a clockwise direction, as viewed in the figure. If movement does occur, tending to engage the pin 122 within one of the sockets, the 40 head 114 eventually moves into a notch 120 at the inner portion of the free end of the lever 116, tending to prevent any movement inwardly even though considerable force may be exerted upon the pin 122. In other words, the mutual actions of 108 and 116 become of an irreversible nature so that positive clutching is insured. The gear driven by the clutch meshes with a gear secured to a backing cylinder 146, which is journalled in the side plates of the frame. The last named gear drives the printing cylinder 150 through another gear which is secured to the latter. This gearing arrangement is shown in the parent application referred to above.

The backing cylinder 146 has slidably mounted in suitable grooves in its ends a movable knife blade 152. This blade is mounted so as to have some freedom of lateral movement at its end which extends outwardly of the backing cylinder and is yieldingly urged toward inactive position by a spring 154. The blade 152 is provided with an extension 156. A cooperating fixed blade 158 is provided in the printing cylinder. Prior to the time when a cutting stroke of the moving blade 152 occurs, and as the printing cylinder approaches its final position, the extension 156 is engaged by the fixed blade 158 and, since the extension 156 extends radially outward from the center of rotation of the cylinder 146 beyond the top line of the driving gear, the blade 152 will be given a slight movement in advance of the cylinder 146 against the tension of the spring 154, thereby preventing the cutting edge of the movable blade from being dulled by contact with the fixed blade. At the time cutting takes place, the 75 blades are properly aligned as indicated in the

figure, so that a proper cutting action is effected, the edge of the movable blade moving in the plane of the upper surface of the fixed blade.

In the present machine, the spring 154 does not serve to actuate the blade 152 in either its cutting or retracting movements. The movable blade is positively moved in both directions. The retracting movement is imparted by engagement with an extension of the blade of the lower end of a lever 162 pivoted at 164 to one end of the backing cylinder and arranged to engage a fixed pin 168, shortly after initial movement of the cylinder takes place. A light spring 166 holds the lever 167 in engagement with the blade, this spring, however, being too light to move the blade. 15

The cutting movements of the blade are imparted by a lever 170 pivoted at 172 to the frame and urged in a clockwise direction by a comparatively light spring 174, which also is ineffective to cause movement of the blade. The lever 170 is provided with a cam following roller 176 engageable with the cam 104, which is provided with three lobes, as illustrated, corresponding to the three sockets 106 of the clutch. The upper end of the lever 170 is provided with a cam surface 178 which is engageable with a pin 180 carried by the cylinder 146. 25

To provide an adjustment for the printing cylinder 150 levers 182 are pivoted at points 184 to the side plates of the frame and provide journals for the trunnions of the printing cylinder. These levers 182 are held in adjusted positions about their pivots 184 by screws 186 passing through slots in the levers 182 and clamping them to the side plates. By reason of this arrangement the approach of the printing cylinder to the backing cylinder may be adjusted. 35

The printing cylinder carries one or more replaceable type plates indicated at 188. In the present instance it also carries a dating head indicated at 190. 40

The ticket strip is led through a guide comprising a bottom plate 264, a top plate 266 and adjustable side guide plates 268 which may be adjusted laterally to take care of various sizes of ticket stock. The top plate 266 is provided with a plurality of tapped holes 270 receiving screws adapted to clamp to the top plate a support 272 on which is pivoted at 274 a lever 276 having a depending arm, which may be engaged by the finger of an operator for a purpose hereafter described, and an upwardly extending arm to which is pivoted at 278 an engaging finger 280, whose counter-clockwise movement, as viewed in the figure, relative to lever 276, is limited to engagement with a stop 282 against which it is urged by a spring 284. By reason of the use of the stop 282, the spring also has a tendency to rotate the spring 276 counter-clockwise, which counter-clockwise movement is limited by a stop pin 286. 60

The finger 280 is arranged to engage within the holes of a ticket strip whenever the ticket strip is in its proper position. When the ticket strip is inserted, the finger 280 may be raised by depression of the backwardly extending end of the lever 276, so that it offers no frictional resistance to advance of the ticket strip. As the ticket strip is fed upwardly, if the finger 280 engages its surface as indicated in construction lines, it acts as a detent, preventing retrograde movement. When a hole in the ticket strip is entered by the finger 280, if the strip is released, the spring 284 will tend to move it backwardly until the finger assumes a position in contact with the stop 282 and the lever 276 engages the stop pin 286. There is 75



thus provided a definite accurate alignment for the strip. The various tapped holes 270 are provided at such positions that the support 272 may occupy three different positions, so that the finger 5 is operable to align strips in which the holes are three different distances apart. If the holes are half these distances apart, it will be obvious that alignment will also be effected so that, with the construction illustrated, tickets of six different 10 sizes may be properly aligned. Specifically, the alignment is necessary before the operation of the knife to sever the strip, the alignment being provided to insure that the severance takes place between tickets along the transverse axes of the 15 openings therein.

A plate 322 is provided with flanges 324 having depressions therein engaging pins 326 which serve for the pivotal support of the plate, the plate being held in contact with these pins by 20 spring ears extending from a plate 327 which forms the lower member of the guide for the ticket being discharged. The plate 322 has its downward termination adjacent the zone of closest approach between the two cylinders. A 25 lever 328 has a forked upper end engaging the plate, this lever being pivoted at 330 so that a clockwise movement of the lever serves to move the lower end of the plate 322 toward the printing cylinder 150. The lever 328 is urged in a 30 clockwise direction by a spring 332, its movement being limited by engagement of its laterally extending arm with the periphery of cam 338 secured to the printing cylinder which cam causes the plate 322 to move away from the printing 35 cylinder through the action of lever 328. This arrangement is used to insure a stripping of the ticket from the type cylinder so that it will be properly discharged and will not tend to adhere to the cylinder and be carried around thereby. 40 Since the printing plate, indicated at 188, is depended upon to feed the ticket by clamping the ticket against the surface, preferably a slightly yielding one, of the backing cylinder 146, the plate 322 is moved by the action of spring 332 45 toward the cylinder 150 just prior to the time the plate 188 moves about to printing position, and is then moved away from the cylinder to permit the plate 188 to pass. It may be pointed out that the feed of a ticket is not continuous, 50 feed only taking place when the ticket is engaged by type.

A presser roller 340 is arranged to project through an opening in the plate 322 and also through an opening in the plate 327 between 55 flanges of a roller 370 in case no ticket is in a position such as that illustrated in the figure. The roller 340 is carried by a stud secured to a lever which is urged by a spring to move the roller 340 toward the left. The movements of 60 the roller are controlled by a cam acting on the lever in a fashion which is clearly described in said parent application but which is of no materiality to the invention claimed herein. The roller 370 is arranged to be driven by spring action in a counter-clockwise direction when a 65 projection 372 carried by its hub 368 is released by a lever 374, a turned end 78 of which may be acted upon by the end 380 of the lever 162 to which reference has already been made. The 70 spring 376 normally urges the lever 374 into position to act as a latch for the projection 372. Rapid movement of the roller 370 upon its release serves to snap the ticket from the machine.

An inker is provided to ink the various type 75 elements carried by the spring 150. This inker

includes a well 384 into which extends a transfer roller 386 adapted to transfer ink to an intermediate roller 392 and thence to an inking roller 394. Assuming that a plurality of tickets 5 are to be issued in a single operation of the machine in the form of a strip so that severance is to occur only once, then the operations involved in connection with the subject-matter claimed herein will be as follows:

As rotation of the backing roller begins, the 10 cam end 380 of lever 162 engages the pin 168 to retract the movable knife 152. The printing plate 188 is first inked and then engages the ticket strip, the uppermost portion of which is approximately at the line of centers of the two 15 cylinders at which line cutting previously took place. Just prior to engagement of the printing plate 188 with the ticket the spring 332 swings the plate 322 toward the cylinder 150 in which position it remains for a short inter- 20 val, so that as the ticket strip advances it will be stripped from the cylinder 150 and guided toward the exit. The plate 322 again moves away from the cylinder 150 before its position is reached by the advancing end of the type 25 plate 188. As the ticket strip advances because of the clamping engagement of the two cylinders the finger 280 yields against the tension of the spring 284 to the position illustrated in the construction lines in the figure, permitting 30 the strip to move forward. As the ticket strip moves forward the timing head 190 prints upon the ticket. During the first revolution the knife actuating lever 170 is held in its extreme clockwise position by the spring 175. As the end of 35 the first revolution approaches the pin 180 engages the cam head 178 of this lever rocking it counter-clockwise. In the construction of the machine in the form now being described, the spring 174 is weak so that even though it should 40 happen to swing the lever 170 clockwise as soon as the cam 80 clears the cam surface 178 nevertheless it will be ineffective to move the knife to cut the ticket strip because of the greater tension of the spring 166 which still holds the knife 45 retracted. It is to be noted that there are provided on the cam 104 three lobes corresponding to the three sockets 106 of the clutch. The angular positions of the lobes with respect to the sockets are such that although a lobe will en- 50 gage the roller after the cam 178 has been cleared by the pin 180, nevertheless such engagement will only occur after the end 160 of the knife has passed downwardly beyond the position of the cam 178. Accordingly, even though a lobe 55 will rock the lever 170 in a clockwise direction such movement will occur too late to cause the knife to move in a cutting stroke. In the operation of the machine illustrated if the spring 174 is sufficiently strong to rock the lever 170 60 clockwise the engagement of a lobe with 176 may not occur at all since the lever will rock clockwise as soon as the end of the knife 160 clears the cam 178. The spring, however, is not 65 depended upon to provide this action, but is provided primarily only to hold the lever 170 in its extreme clockwise position after it has been moved to this position by the cam 104.

In the meantime, as the initial position is being passed the lever 162 is still in its clockwise 70 position and accordingly it does not engage the latch 374, so that the roller 370 will not be liberated.

After the timing head has disengaged the ticket so that feeding ceases, the ticket strip is 75



in a released condition, and the action of finger 280 in a hole therein may impart to it a slight retrograde movement serving to align it for the next printing. A similar action occurs at the end of the last cycle aligning it for cutting.

The same sort of events will occur through subsequent revolutions of the printing cylinder until the last one. At the end of the last revolution the clutch is disengaged and the motor is deenergized. The cycle of the machine, however, is completed by the overrun of the motor.

As the final position of the rollers is approached the pin 180 again engages the cam 178 and rocks the lever 170 counter-clockwise. As the position of rest is attained the pin 180 clears the cam 178 and the movable knife 152 is lined up with respect to the fixed knife 158. Although the clutch is now disengaged the overrun of the motor will continue to drive the cam 104 with the result that one of the lobes of this cam, which has heretofore been rotating with the other parts, moves around engaging the roller 176 thereby rocking the lever 170 clockwise in a positive fashion and causing the cam 178 to engage the knife 152 moving it positively in its cutting stroke. As the knife 152 advances the lever 162 is moved counter-clockwise and as the severing of the strip is finished the cam shaped upper end 380 of the lever 162 trips the detent 378 releasing the projection 372 so that the roller 370 is rapidly rotated in a counter-clockwise direction by the action of its driving spring. In the meantime, the roller 340 will have dropped into contact with the ticket strip and consequently the two rollers rotate together and the tickets are snapped out of the machine. Normally this machine will not have a ticket located between the rollers 340 and 370, this ticket being merely illustrated in the drawing for the purpose of illustrating the position of the ticket just as it is being issued.

Before the cylinder 150 comes to its initial position following any revolution the ticket strip will have been released by the rearmost printing surface which, in this case, is that of the dating and timing mechanism. The released strip is then lined up properly by the finger 280 which will have previously been displaced slightly upwardly with its end projecting into a hole in the strip. Accordingly the strip is lined up between revolutions of the cylinder to insure proper printing and after the last revolution of a cycle to insure cutting at the proper place.

It is usually preferable to sever a series of tickets only after the last has been issued. The machine, however, may be readily moved to sever the tickets and eject them individually. To accomplish this it is only necessary to provide a relatively weak spring 166 and a strong spring 174, preferably arranged at a more advantageous angle than that shown. In such case, the knife will be yieldingly moved to cut the ticket strip upon each revolution of the cylinders irrespective of the operation of the cam 104. Also, in such

event, the lever 162 will operate to trip the latch 174 with the result that the roller 370 will reject the individual tickets. As an alternative to this, the lobes of the cam 104 may be advanced relatively to the sockets 106 so that, while the clutch is engaged, the lever 170 will be rocked early enough to actuate the knife at the end of every revolution of the cylinder.

In the machine as described feeding of the ticket strip takes place only by contact therewith of the printing plates. If it is desired to print and also advance the ticket to an extent in excess of the printing length lateral flanges may be provided on the sides of the printing plates and extending beyond their limitations in such positions that, while they will engage the edges of the ticket strip, they will not be inked and will accordingly function only as feeding members.

If it is desired to issue preprinted tickets, without any additional printing matter, the simplest method of accomplishing this is merely to remove the inker leaving in the machine a printing cylinder carrying a plate. The plate will then serve to feed without printing. Alternatively, feeding flanges can be provided on a special cylinder for advancing the strip without printing.

It will be clear that numerous variations may be made in specific details without departing from the invention as defined in the claims.

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

1. A ticket issuing machine including means for printing a ticket strip, said means including a rotary printing member, a knife mounted for radial movement upon the member, and means for radially moving the knife to sever the strip.

2. A ticket issuing machine including means for feeding and printing a ticket strip, said means including a plurality of rotary feeding members, one of which carries a printing element, said members being arranged to engage opposite sides of the strip, knives rotatable with the members and adapted to cooperate with each other to sever the strip, one of said knives being mounted for radial movement upon its member, and means for radially moving the last mentioned knife to effect severing.

3. A ticket issuing machine including means for printing and feeding a ticket strip, means for severing the strip, and separate means for engaging a hole in the strip to adjust it lengthwise between completion of the printing and the severing.

4. A ticket issuing machine including rotary means for printing a ticket strip and, by engagement with the strip, feeding the same, means for severing the strip, and separate means for engaging a hole in the strip to adjust it lengthwise between completion of the printing and the severing.

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