March 6, 1945. J. E. HOPPING 2,370,730

TICKET PRINTING AND ISSUING MACHINE

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Fig. 1.

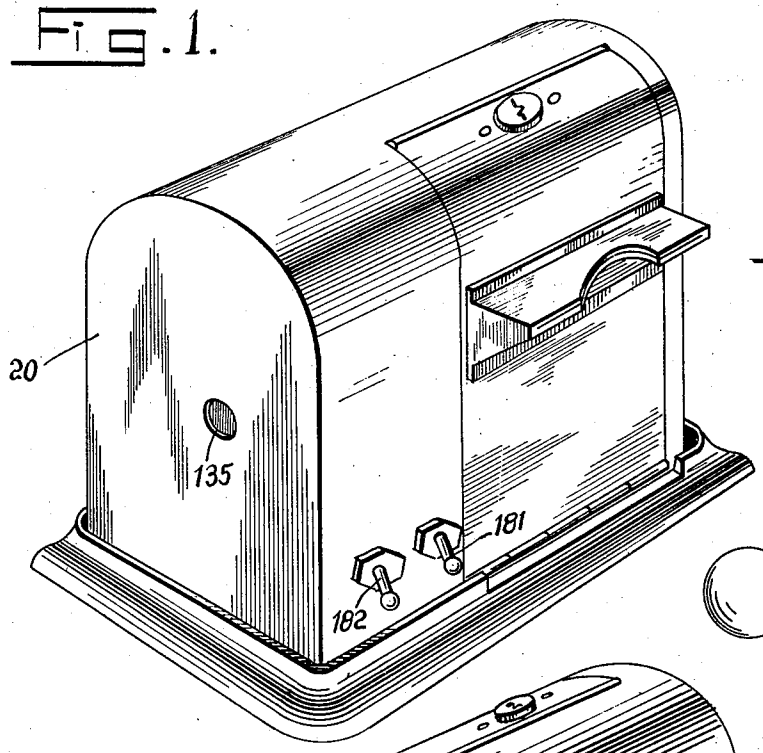


Fig. 13.

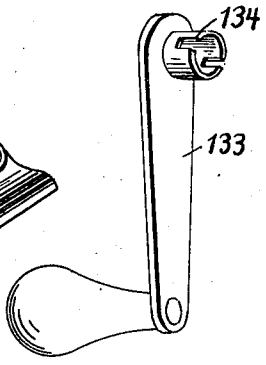
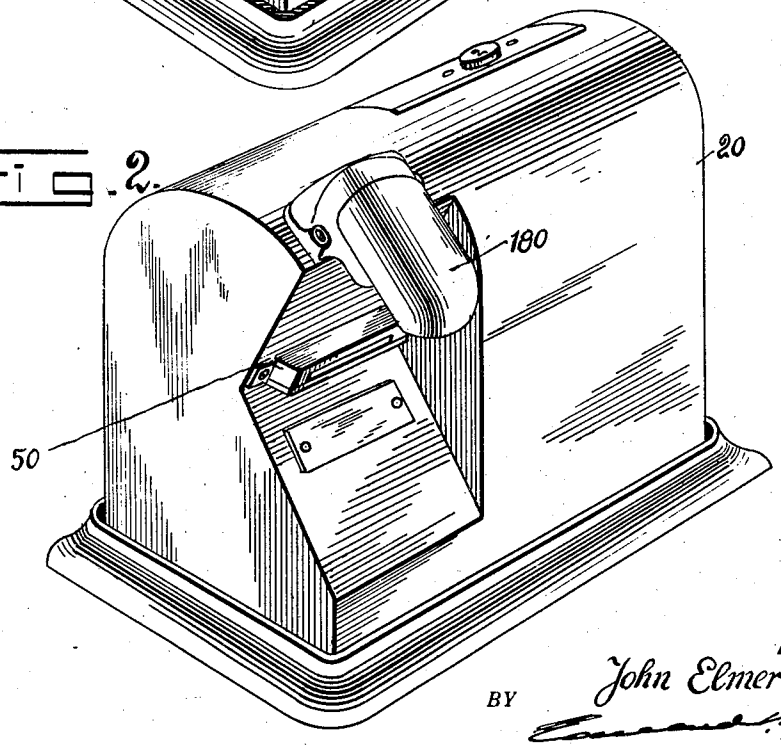


Fig. 2.



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BY

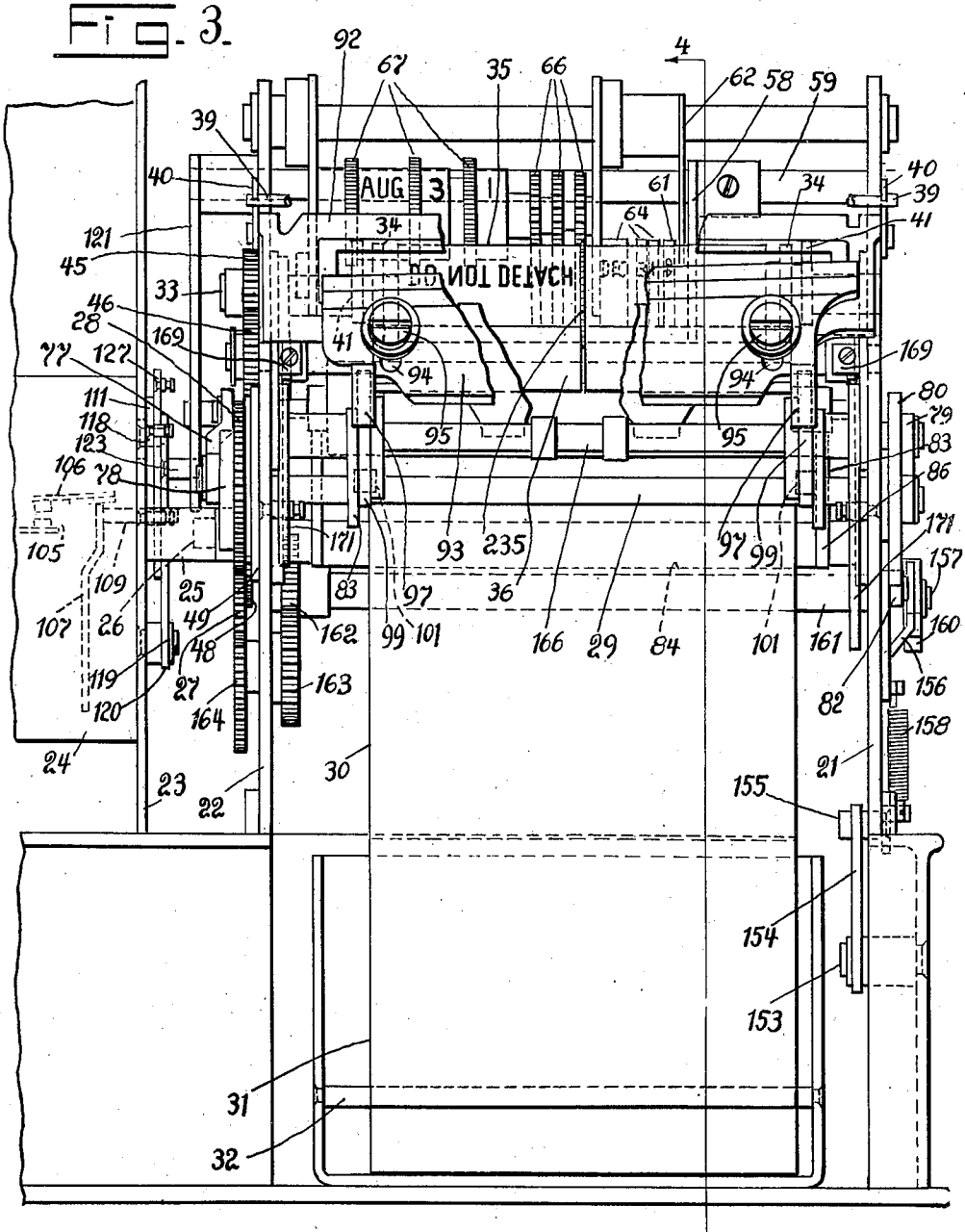
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TICKET PRINTING AND ISSUING MACHINE

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Fig. 3.



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TICKET PRINTING AND ISSUING MACHINE

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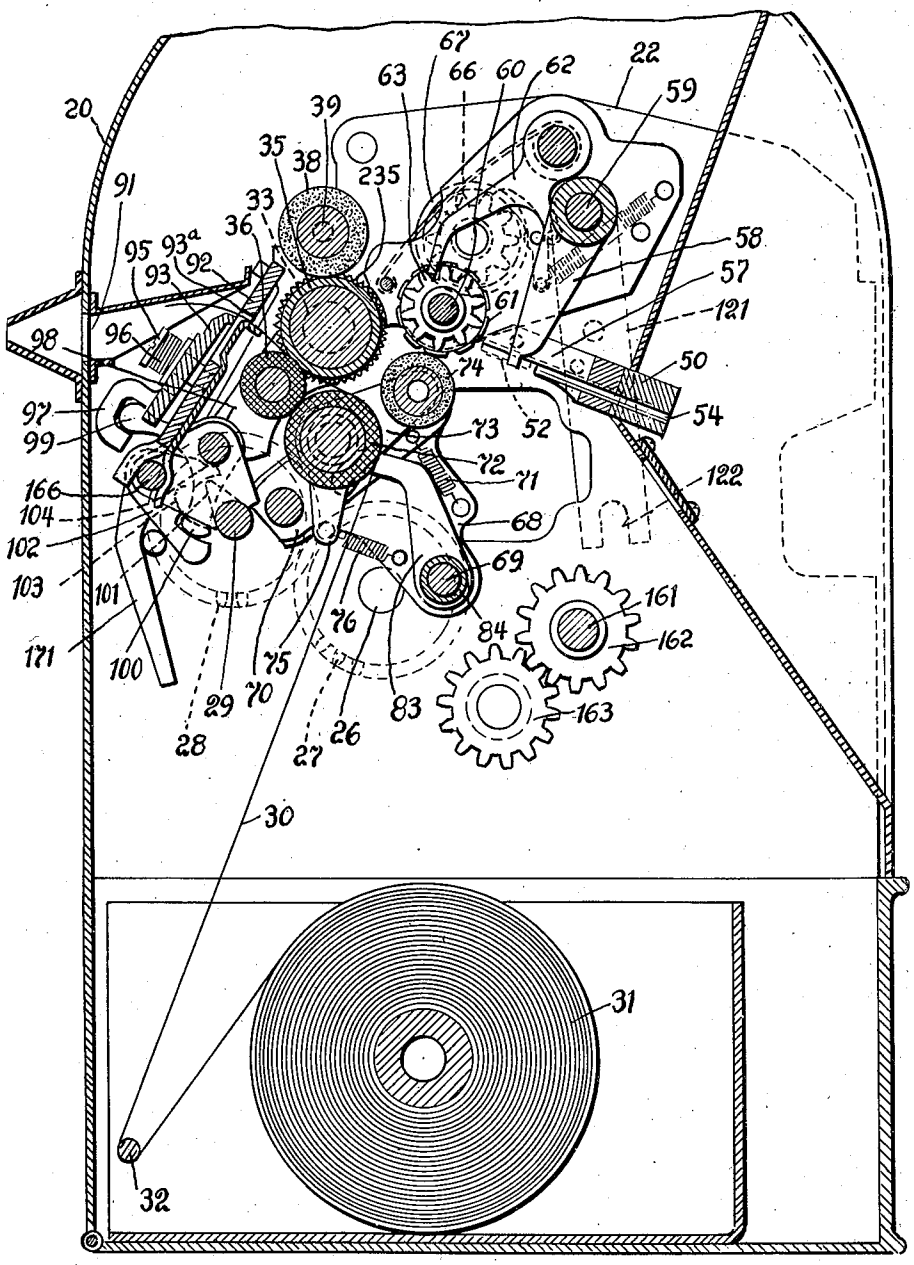


Fig. 4.

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TICKET PRINTING AND ISSUING MACHINE

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Fig. 5.

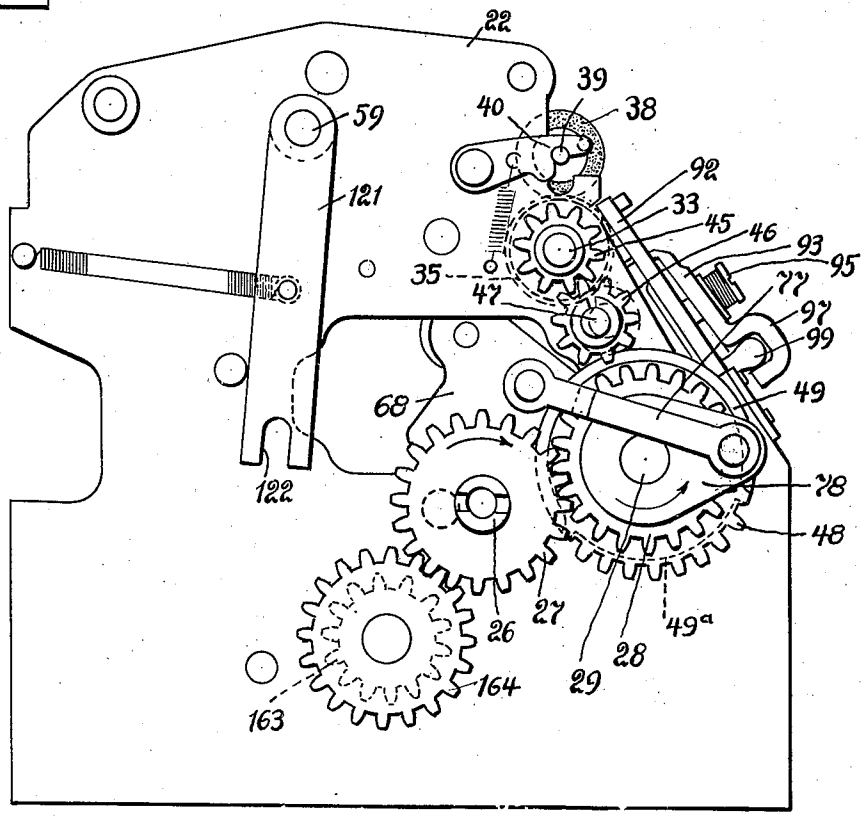
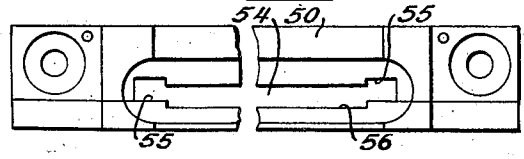


Fig. 11.



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TICKET PRINTING AND ISSUING MACHINE

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Fig. 6.

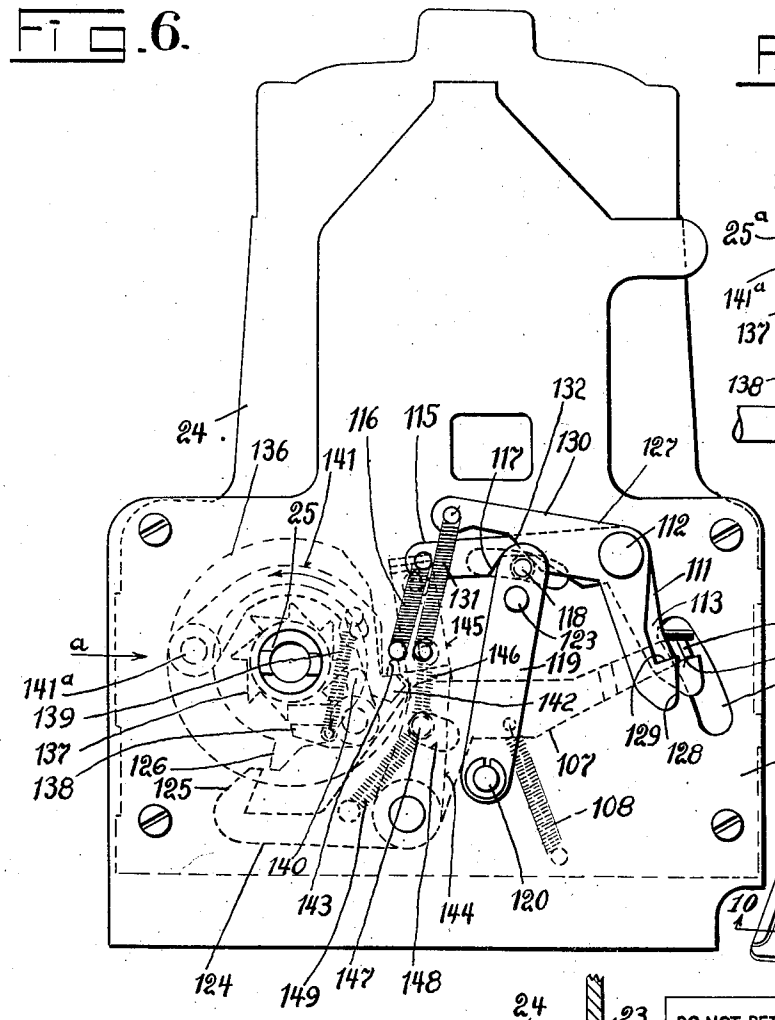


Fig. 7.

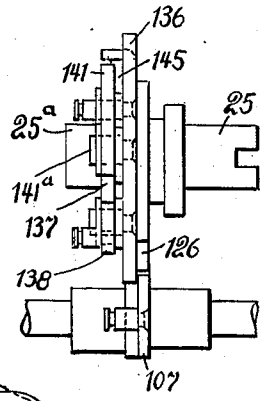


Fig. 9.

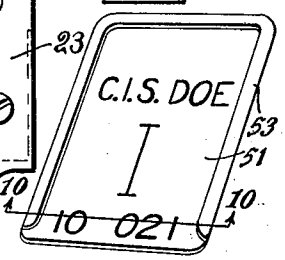


Fig. 8.

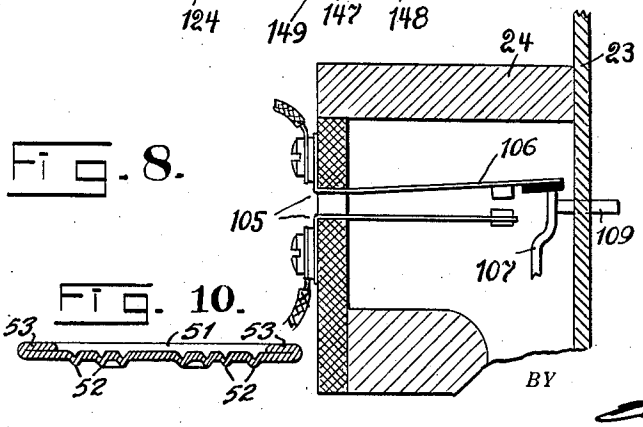


Fig. 10.

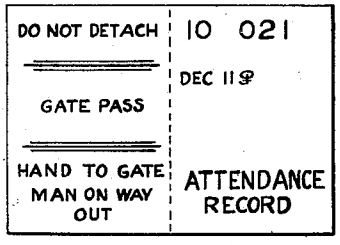


Fig. 12.

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Patented Mar. 6, 1945 2,370,730

UNITED STATES PATENT OFFICE

2,370,730

TICKET PRINTING AND ISSUING MACHINE

John Elmer Hopping, Dayton, Ohio, assignor to Central National Bank of Cleveland, Cleveland, Ohio, as trustee

Application September 11, 1940, Serial No. 356,363

5 Claims. (Cl. 192—.02)

This invention relates to a machine for printing an individual identifying number or symbol on a ticket, record sheet or the like. In the present instance the machine is intended to print an employee's identifying number on a ticket, when he enters the plant, and to issue the ticket to the employee who delivers the same to a foreman or timekeeper for use in compiling the payroll. It will be obvious, however, that the invention may be embodied in machines used for various purposes where it is desirable that a printed record shall bear a number or other designation identifying an individual.

One object of the invention is to provide such a machine which is controlled by the insertion of an identifying check or the like.

A further object of the invention is to provide such a machine in which the identifying number may be printed on a ticket from type or the like on the check.

A further object of the invention is to provide such a machine, the operation of which will be initiated by the insertion of the check and will be automatically interrupted when the ticket has been printed and issued.

A further object of the invention is to provide such a machine having means for positively preventing the operation of the machine, either by motor or manually, until a check has been inserted in printing position.

A further object of the invention is to provide such a machine having improved mechanism for taking impressions both from the check and from other data printing type upon each operation thereof.

A further object of the invention is to provide such a machine which will print on a continuous web of paper and which has improved means for severing the printed portion of the web.

Other objects of the invention may appear as the mechanism is described in detail.

In the accompanying drawings Fig. 1 is a perspective view of a machine embodying the invention, showing the rear side of the cabinet; Fig. 2 is a similar view showing the front side of the cabinet; Fig. 3 is a front elevation, partly broken away, of the mechanism which is contained within the cabinet; Fig. 4 is a section taken on the line 4—4 of Fig. 3, looking in the direction of the arrows; Fig. 5 is an elevation of one side of the main frame with the mechanism mounted thereon; Fig. 6 is an elevation of a supplemental frame carrying the motor; Fig. 7 is an edge view of mechanism mounted on the supplemental frame, looking in the direction of the arrow *a* on Fig. 6; Fig. 8 is a detail view of the switch; Fig. 9 is a perspective view of one of the checks used in operating the machine; Fig. 10 is a section taken on the line 16—16 of Fig. 9, on an enlarged scale; Fig. 11 is a front elevation, partly broken away, of the chute, on an enlarged scale; and Fig. 12 is a facsimile of a ticket printed by the machine; Fig. 13 is a perspective view of an emergency crank.

In these drawings I have illustrated one embodiment of my invention and have shown the same as designed for printing a workman's identifying number on a ticket which is to be issued to him. It will be understood, however, that the machine, either with or without modification, may be used for various purposes and that the mechanism may take various forms.

In this embodiment of the invention the mechanism, which is enclosed in the cabinet 20, comprises a main frame including side members 21 and 22 and a supplemental motor frame 23, a portion only of which is shown in Fig. 3. The main part of the mechanism is supported by the frame members 21 and 22, and the motor, the casing of which is shown at 24, is mounted on a supplemental frame 23 and is provided with a driving shaft 25 which projects beyond the supplemental frame member 23 and has its outer end portion 25 slotted for interlocking engagement with a shaft on the main frame. The shaft 25 may be the armature shaft of the motor or it may be a shaft driven by the motor. In the present arrangement the motor shaft 25 has interlocking engagement with the adjacent end of a shaft 26 mounted on the main frame member 22 and which, in the present instance, is a short or stud shaft. A gear 27, Fig. 5, is secured to the shaft 26 and meshes with a gear 28 which is rigidly secured to a shaft 29 from which are operates various parts of the mechanism which will be hereinafter described.

In the present instance a ticket is printed on and severed from a web of paper 30 which is taken from a roll 31 and passed about a guide rod 32 to a feeding device which comprises a shaft 33, Fig. 4, having secured thereto an electroplate 35 adapted to print on the ticket certain data which is common to all tickets issued, and also having parts which cooperate with a roller 36 which, in the present instance, constitutes both a feed roller and an impression roller to take an impression from the electroplate 35 on the web of paper. Mounted above the electroplate 35 is an ink roller 38, the shaft 39 of which is pressed against the electroplate by spring pressed bear-

ings 40. Cams 41 on the shaft 33 control the position of the ink roller with relation to the electroplate. The feeding device may be actuated in any suitable manner and in the present arrangement a shaft 33 is connected by suitable gearing, not shown, with the roller 36 and also has secured thereto a gear 45 which meshes with a gear 46 mounted on a stud 47 carried by the frame member 22. The gear 46 is arranged to be engaged and actuated by a gear 48 secured to the shaft 29, Fig. 5. In the present instance this gear 48 is shown as a sector gear and is arranged to actuate the feeding device in timed relation to the printing mechanism, to be hereinafter described. The teeth of the gear 46 extend across the edge of a disk 49, rigidly secured to the shaft 29, and one tooth of gear 46 is partially cut away (Fig. 6) to receive the edge of the disk and to lock the gear, and therefore the feeding mechanism, normally against operation, the periphery of the disk being cut adjacent the teeth of the sector gear 48, as shown at 49a, to release the gear 46 for rotation by the sector gear. The present ticket is weakened along a median line, as by perforations, so that it can be divided into two parts after having been issued. To enable this to be done the electroplate is divided into two parts and a serrated wheel 235 is interposed between those parts to perforate the web as it moves between the impression roller and the electroplate, as shown in Figs. 3 and 4.

The feeding device is arranged adjacent the rear or discharge side of the machine and mounted in the front portion of the machine is a chute 50 through which there may be inserted in the machine a check or the like having on one face thereof type identifying the holder of the check. This check may be of any suitable character and as shown in Figs. 9, 10 and 11 it is in the form of a flat plate 51 having on its lower side near one end thereof type faces 52, preferably formed by stamping or embossing the numbers on the check so that they will project beyond the lower surface thereof. In the present check the number is in two parts, the first part designating the department in which the employee works and the second part being the number which the workman has been assigned in that department. The lateral edge portions of the check and that end thereof opposite the number are provided with a bead or shallow rib 53 which is preferably formed by bending edge portions of the check onto the body thereof. The chute 50 is in the present instance formed in two parts, the inner portion being rigidly mounted on the main frame and the outer portion being carried by the cabinet 20. As here shown, the chute is provided with a substantially horizontal slot 54, adapted to receive the check, the upper wall of the slot having at its lateral edges grooves 55 to receive the lateral portions of the bead on the check and the lower wall of the slot having its intermediate portion depressed or recessed, as shown at 56, to provide clearance for the type on the check. The check is of such length that when fully inserted in the chute, that is, when the transverse or outer portion of the bead 53 contacts with the end of the chute, the type 52 will extend beyond the lower portion of the chute, as shown in Fig. 4, and will be in printing position, the upper portion of the chute extending beyond the lower portion thereof to firmly support the check in printing position. The inner portion of the chute is provided at one side thereof with a slot 57 through which extends an arm 58 rigidly secured to a shaft 59, the lower portion of the arm being arranged in the path of a check inserted in the chute so as to be actuated thereby to control the operation of the various parts of the machine, as will be hereinafter described.

It is frequently desirable to print on the ticket other data with which the check number is associated and the present machine is provided with means for printing the date on the ticket, as shown in Fig. 12. The date printing mechanism may be of any suitable character, and, as here shown, it comprises a plurality of type wheels 61 and 64, mounted on a rod 60, which are of a known character and may be set by the usual or any suitable means. The type wheels 61 and 64 are arranged adjacent to the printing position of the check type 52 and, in the present instance, lie between the shaft 50 and the electroplate 35.

An impression may be taken from the type on the check and on the date wheels in any suitable manner. The means for taking this impression is not a part of the invention herein claimed and need not be described in detail. Briefly it comprises a printer frame 68 pivotally mounted on the shaft 69 and provided with an impression roller 72 and an ink roller 74 arranged to be moved across the type faces by the oscillation of the printer frame. The printer frame is actuated by the shaft 29, preferably through pitman and crank connections, one of which is shown at 77 and 78 in Fig. 5. The web of paper on which the impression is to be taken extends from the guide rod 32 about the impression roller 72 on its way to the feeding devices, which, when stationary, hold the end of the web against movement. When the printer frame moves clockwise about the axis of the shaft 69 the rollers are moved across the type faces and the paper is carried along with the impression roller and brought successively into contact with the type on the date wheels and on the check to take an impression therefrom, and are then restored to their initial positions.

After the impression has been taken the web 30 is advanced by the feeding device so as to move the printed portion thereof to a position to be severed from the web and issued as a ticket. In the present instance the end portion of the web is fed into a discharge chute 91 and is positioned to be engaged by a severing device which, as here shown, comprises a plate 92 having an opening 93a through which the web passes. Mounted on this plate 92 for transverse sliding movement with relation thereto is a blade 93 which is actuated by bell cranks each having a part 99 engaging the blade and a part 100 in the path of a cam 101 on the shaft 29, the cams being so arranged that they will actuate the blade and sever the ticket at the end of the web feeding operation.

The shaft 29 makes one complete rotation upon each operation of the machine and during that rotation actuates the printer, the web feeding device and the ticket severing device in rapid succession. The shaft 29 is driven by the motor 24 through shafts 25 and 26 and gears 27 and 28, and the operation of the motor is controlled by and preferably initiated by the insertion of a check 51 in the chute 50. This control may be effected in various ways and, in the present instance, means are provided for controlling the operation of the motor switch, this switch being preferably held normally in its open position by means which can be released only by the insertion of a check. The switch is shown at 105 in Fig. 8 and the movable member 106 thereof is of resilient material normally biased to circuit closing

position. Mounted within the motor casing is a switch controlling member, preferably in the form of a lever 107, Figs. 3 and 6, which is arranged to engage the movable member 106 of the switch 105 and which is biased, as by a spring 108, toward its switch closing position but is held normally in switch opening position by the check controlled means. In the present arrangement the lever 107 is provided with a finger 109 which extends through a slot 110 in the supplemental frame member 23. A bell crank lever 111 is pivotally mounted at 112 on the outer side of the frame member 23, that is, the side adjacent the main frame. One arm, 113, of this lever is provided near its lower end with a shoulder 114 adapted to be engaged beneath the finger 109 of the controlling member 107 and the other arm 115 is acted upon by a spring 116 which urges the shoulder 114 toward and retains the same in a position to have supporting engagement with the finger of the controlling member 107, thus retaining the same in circuit opening position against the action of the spring 108. The arm 115 of the lever 111 has in its lower edge a recess 117 provided with a cam-shaped end wall and adapted to receive a stud 118 carried by an arm 119 which is pivoted at its lower end on a stud 120. When the arm 119 is in its normal position the stud 118 extends into the recess and the shoulder 114 is held in its operative position with relation to the controlling member 107. The shaft 59 which carries the check actuated arm 58 has secured thereto for movement therewith a downwardly extending arm 121, the lower end of which is slotted at 122 to receive a stud 123 on the arm 119 and cause that arm to be moved in such a direction that the stud 118 will act on the cam surface of the recess 117 to cam the shoulder 114 out of engagement with the controlling member 107 and permit the latter to move to switch closing position, thus starting the motor and initiating the operation of the machine. The swtich controlling member 107 is provided with a tail portion 124 having a nose 125 so arranged that the movement of the control member 107 to switch closing position will move the nose 125 into the path of a cam 126 rigidly secured to and rotating with the motor driven shaft 25, which rotates in the direction of the arrow in Fig. 6. Thus just before the shaft 25 completes a single rotation the cam 126 will act on the control member 107 to again move the same to switch opening position.

If the check has been removed from the chute to permit the lever actuating arm 119 to return to its normal position before the control member 107 returns to its switch opening position, the lower end of the arm 113 of the bell crank will have been moved into the path of the finger 109 so as to be engaged thereby as the controlling member 107 moves to switch opening position, thus retracting the arm 113 until the finger has passed the same, and the shoulder 114 then snaps into supporting engagement with the finger. However, these several operations take place very quickly and it will frequently happen that the check will not be removed from the chute before the switch controlling member is returned to switch opening position. I have therefore provided means for preventing the switch controlling member from again moving to switch closing position after it has been moved to switch opening position and released by the cam 126 on the operating shaft. For this purpose a second bell crank lever 127 is pivotally mounted on an axis coincident with the axis of the bell crank 111 and is provided at its lower end with a beveled nose 128, the upper edge of which forms a shoulder 129. The other arm 130 of this bell crank lever is acted upon by a spring 131 which tends to move the shoulder 129 into the path of the finger 109 of the controlling member 107. However, this movement of the lever 127 is normally prevented by the contact of the stud 118 on the arm 119 with a cam surface 132 on the lower edge of the arm 130 of the bell crank 127, so that so long as the actuating arm 119 is in its normal position the bell crank 127 and its shoulder 129 are inoperative. The movement of the actuating arm 119, by the insertion of a check, to retract the bell crank lever 111 and release the controlling member 107 will also release the bell crank lever 127 and permit the nose 128 thereof to be moved toward the path of the finger 109. The shoulder 129 of bell crank 127 is slightly higher than the shoulder 114 of bell crank 111. Consequently the shoulder 129 cannot move into its operative position until the controlling member 107 has moved past the same. It will then assume a position in the path of the finger 109 and when the latter is again moved upwardly to switch opening position it will engage the nose 128, and the nose will be retracted thereby and will then spring into operative engagement therewith. Thus the shoulder 129 will retain the switch controlling member in switch opening position until the check has been withdrawn from the chute, and the actuating member 118 returned to normal position to release the bell crank 111 and permit the shoulder 114 to move into retaining position with relation to the switch controlling member.

The foregoing mechanism positively controls the operation of the machine by the motor but the machine may be actuated manually in the event no current is available for operating the motor. For this purpose there is provided a crank 133, Fig. 13, having a socket portion 134 adapted to be inserted through an opening 135 in the cabinet and to operatively engage the outer end of the shaft 25 in a well known manner, the point of engagement not being here shown. In order to prevent the manual operation of the machine until a check has been properly inserted, means are provided to normally prevent the operation of the shaft 25 and to release the same by the check controlled mechanism. For that purpose the shaft 25 is in the present instance formed in two parts, the outer part having the cam 126 secured thereto and also having secured thereto a disk 136. Mounted on the other part of the shaft, indicated in Fig. 7 as 25*a*, is a ratchet wheel 137 adapted to be engaged by a pawl 138 pivotally mounted on the disk 136 and urged toward engagement with the ratchet wheel by a spring 139. The pawl 138 has a tail portion 140 arranged in the path of an arcuate arm 141 pivotally mounted on the disk 136 at 141*a* and having at its opposite end a nose 142, the outer portion of which is adapted to be engaged by a lug 143 on a lever 144, the inner edge of the nose 142 bearing against the tail 140 of the pawl 138 and acting thereon in a direction to disengage said pawl from the ratchet wheel. The lug 143 is carried by a part 145 slidably mounted on the arm 144 and urged downwardly by a spring 146. A stud 147 carried by the arm 144 extends through a slot 148 in the switch controlling member 107 and is acted upon by a spring 149 which tends to move the arm toward the disk

136. When the switch controlling member 107 is in switch opening position the stud 147 will lie in engagement with or close to the end of the slot 148 and the spring 149 will hold the arm 144 in such a position with relation to the disk 136 that when the shaft 25 is moved to its normal position the lug 143 will overhang the nose 142 on the arcuate arm 141 and the spring 146 acting on the slidable part 145 will pull the lug 143 downwardly and press the nose 142 of arcuate arm 141 against the tail 140 of pawl 138, thereby pressing the latter out of engagement with the ratchet wheel 137 and disconnecting the two parts of the shaft. When the switch controlling member 107 is moved to switch closing position it will actuate the arm 144 to move the lug 143 out of engagement with the nose 142, thereby releasing the pawl 138 and permitting it to be moved by the spring 139 into operative engagement with the ratchet wheel 137 to establish an operative connection between the two parts of the shaft. The next movement of the switch controlling member to switch opening position again moves the lug 143 into the path of the nose 142 on arm 141 so that it will be engaged by the latter at the end of a complete rotation of the shaft and will cause the pawl to be disengaged from the ratchet wheel.

An electric lamp is arranged within the fixture 180, Fig. 2, to illuminate the receiving end of the chute and the circuit for this lamp is controlled by a switch 181. When the machine is so located that it is exposed to low temperatures it is also desirable to provide the same with a heater and a switch 182 controls the circuit for this heater.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Mechanism for controlling the operation of the actuating means for a device the operation of which is initiated by the insertion of a check, said mechanism comprising a controlling member movable to a position to permit the operation of said actuating means or to a position to prevent such operation and biased to operation permitting position, means controlled by said actuating means for moving said controlling member to said operation preventing position, a lever having a part to engage said controlling member and retain the same in said operation preventing position, means to yieldably hold said lever in retaining engagement with said controlling member, a member pivotally mounted on a fixed support and having a part spaced from its pivotal axis to engage said lever with a cam action and move the same out of retaining engagement with said controlling member and thereby release said controlling member for movement to operation permitting position, a second member pivotally mounted on a fixed support and operatively connected with said releasing member, and check controlled means to actuate said second pivotal member and release said controlling member upon the insertion of a check.

2. Mechanism for controlling the operation of a device to be operated and including a controlling member movable to a position to permit the operation of said device or to a position to prevent such operation and biased to said operation permitting position, means to move said controlling member to operation preventing position at the end of a predetermined operation of said device to be operated, a lever pivotally mounted between its ends on a fixed support, having on one side of its pivotal axis a part to engage said controlling member and retain the same in operation preventing position and having on the other side of said axis a cam surface, a member pivotally mounted on a fixed support and having a part spaced from its axis to engage said cam surface and move said lever out of retaining engagement with said controlling member to permit the latter to move to operation permitting position, and an actuating member mounted separately from and operatively connected with said releasing member.

3. Mechanism for controlling the operation of a device to be operated including a member movable to a position to permit the operation of the device and to a position to prevent said operation, a movable element having a part to engage said controlling member and retain the same in said operation preventing position, means for holding said movable element in engagement with said controlling member, a second movable element having a part adapted to have retaining engagement with said controlling member and biased toward retaining position, controlling means for said movable elements arranged to hold said second movable element normally in an inoperative position, means to actuate said element controlling means to move the first mentioned movable element to an inoperative position, thereby permitting said controlling member to move to operation permitting position, and to release said second element for movement to an operative position in which said part thereof will have retaining engagement with said controlling member when the latter is returned to its operation preventing position, and means for returning said controlling member to said operation preventing position at the end of a predetermined movement of said device to be operated.

4. Mechanism for controlling the operation of the actuating means for a device to be operated, including a controlling member movable to a position to permit the operation of said device or to a position to prevent said operation and biased to operation permitting position, a lever having a part to engage said controlling member and retain the same in operation preventing position, yieldable means for holding said lever in engagement with said controlling member, a second lever having an inclined surface and a part adapted to have retaining engagement with said controlling member and biased toward retaining position, a controlling device for said levers arranged to hold said second lever normally in an inoperative position, means to operate said lever controlling device to move the first mentioned lever to an inoperative position, and thus release said controlling member for movement to operation permitting position, and to release said second lever for movement to a position in which its inclined surface is in the path of said controlling member when the latter is returned to operation preventing position, and means for returning said controlling member to operation preventing position at the end of a predetermined movement of said device to be operated.

5. Mechanism for controlling the operation of the actuating means for a device to be operated,

including a controlling member movable to a position to permit the operation of said device or to a position to prevent said operation and biased to operation permitting position, two levers pivotally mounted on a common axis and each having near one end thereof a shoulder to engage the lower edge of said controlling member and retain the latter in operation preventing position, yieldable means for urging said levers to retaining positions, each lever having a cam surface, an operable device cooperating with said cam surfaces to control the positions of said levers and so arranged that when in its normal position one of said levers will be in retaining engagement with said controlling member and the other lever will be in a retracted position with its shoulder slightly higher than the shoulder of the first mentioned lever, means to actuate said operable device to retract the first mentioned lever and permit said controlling member to move to operation permitting position and to release the last mentioned lever for movement into the path of said controlling member after the latter has passed the same, and means controlled by said actuating means to return said controlling member to operation preventing position thereby causing the last mentioned lever to snap into engagement with said controlling member and support the same until said operable device is restored to its normal position.

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