

June 4, 1929.

F. ELLER

1,715,451

APPARATUS FOR PRINTING TICKETS AND THE LIKE

Filed Aug. 1, 1927

2 Sheets-Sheet 1

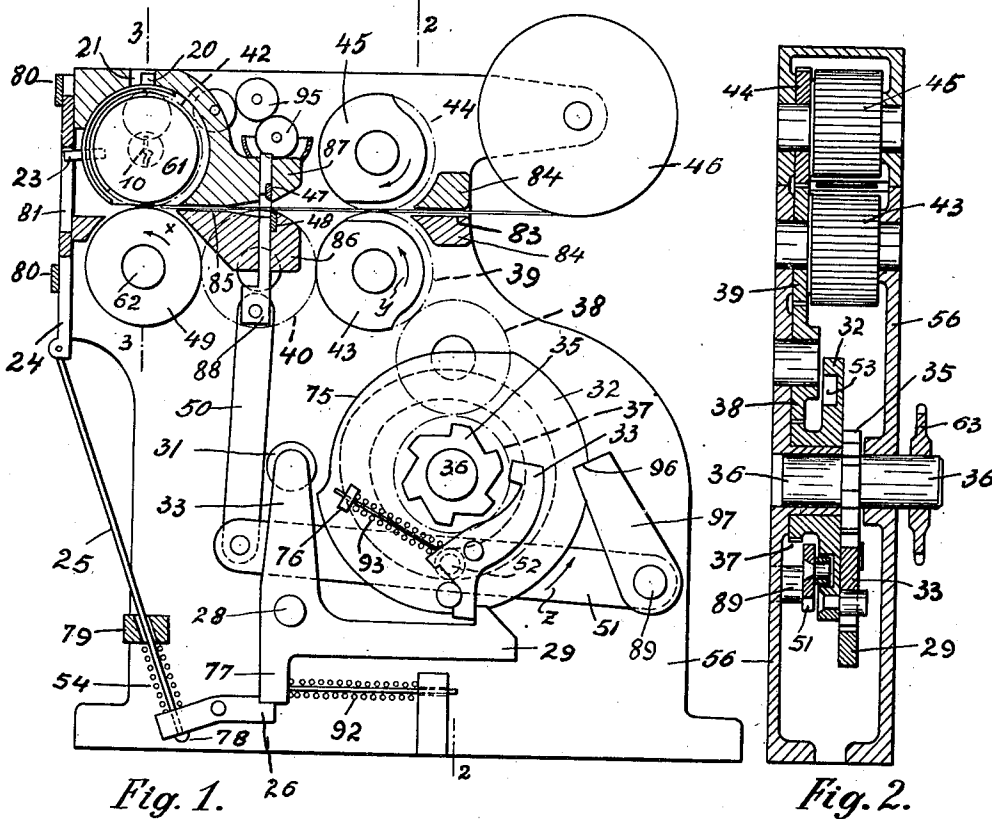


Fig. 1.

Fig. 2.

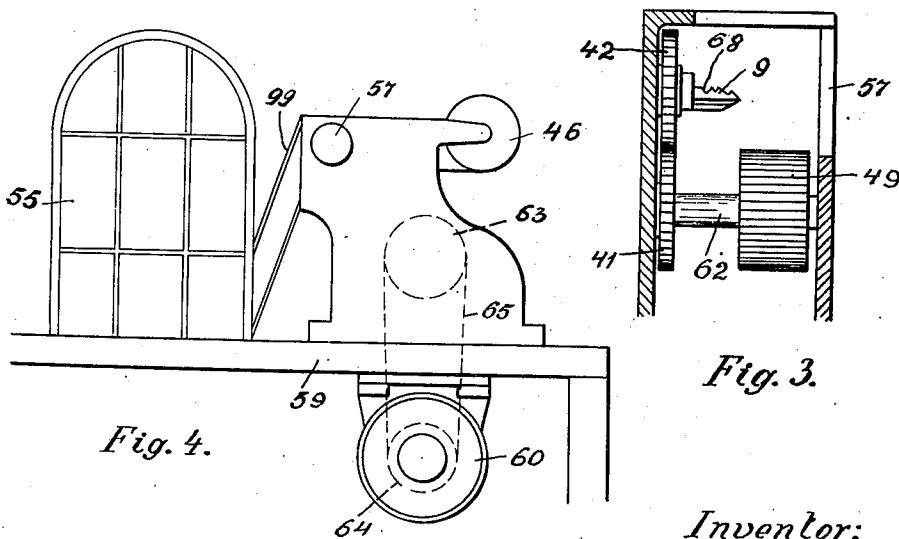


Fig. 4.

Fig. 3.

Inventor:
Fritz Eller
by Frank Teichow.
Attorney.

June 4, 1929.

F. ELLER

1,715,451

APPARATUS FOR PRINTING TICKETS AND THE LIKE

Filed Aug. 1, 1927

2 Sheets-Sheet 2

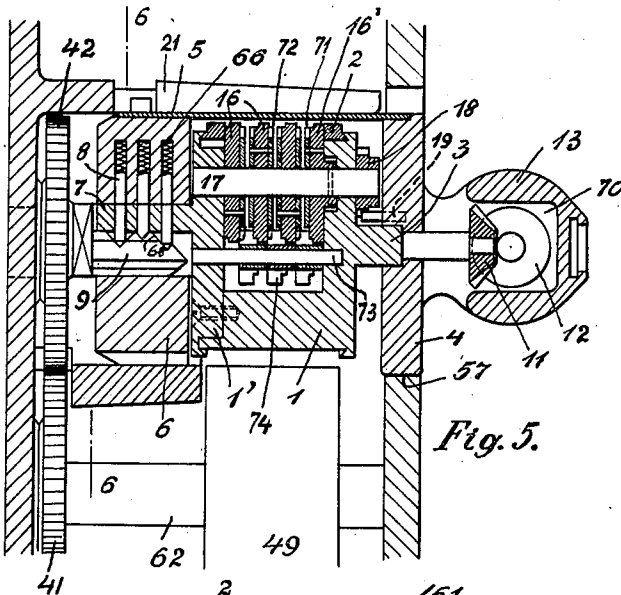


Fig. 5.

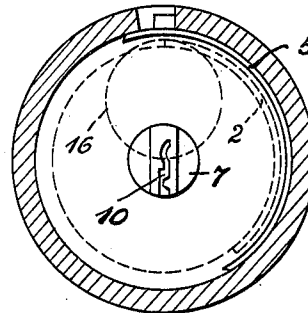


Fig. 6.

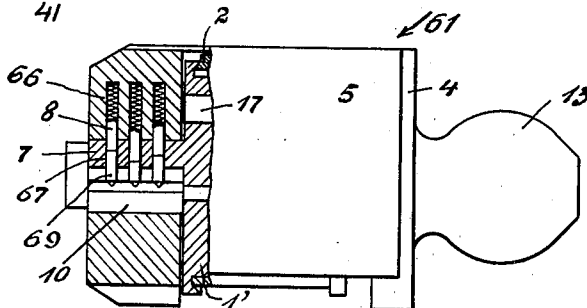


Fig. 7.

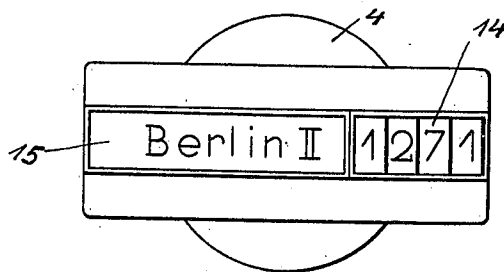


Fig. 8.

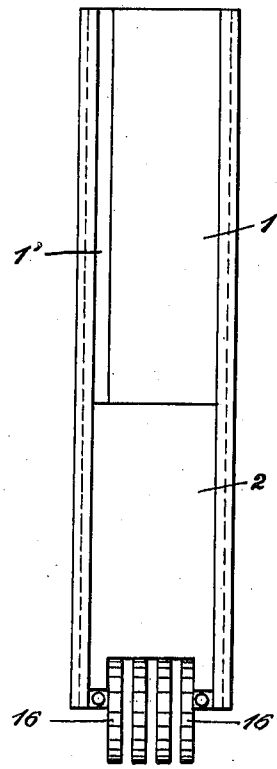


Fig. 9.

Inventor:
Fritz Eller
by Frank Reichhold
Attorney.

UNITED STATES PATENT OFFICE.

FRITZ ELLER, OF BERLIN-WANNSEE, GERMANY.

APPARATUS FOR PRINTING TICKETS AND THE LIKE.

Application filed August 1, 1927, Serial No. 209,780, and in Germany August 24, 1926.

My invention relates to improvements in apparatus for printing tickets and the like, and more particularly in apparatus of the type in which a printing apparatus cooperates with a plurality of printing members adapted to be individually mounted therein for printing different tickets. In order to prevent non-authorized use of the printing members for printing tickets independently of the printing apparatus, it has been proposed to enclose all the printing members within a casing connected with the printing apparatus, the said printing members being transmitted from the said casing into the printing apparatus and returned therefrom into the casing after printing. The object of the improvements is to provide an apparatus of the class referred to in which the printing members can be stored on a shelf or the like, and in which the individual printing members are provided with locking means preventing non-authorized use thereof. With this object in view my invention consists in providing each printing member with means for normally rendering the types thereof inoperative, the said means being adapted to be set into position for permitting printing after the printing member has been placed into the printing apparatus. In the preferred construction the said means are in the form of a plate normally covering the types and adapted to be moved away therefrom after placing the printing member into the printing apparatus.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings, in which

Fig. 1, is a sectional elevation showing the printing apparatus,

Fig. 2, is a sectional elevation taken on the line 2—2 of Fig. 1,

Fig. 3, is a partial sectional elevation taken on the line 3—3 of Fig. 1, the printing member being removed,

Fig. 4, is an elevation showing the printing apparatus in connection with the table of the attendant operating the apparatus and the gate through which the tickets are sold,

Fig. 5, is a sectional elevation showing the printing member and a part of the printing apparatus on an enlarged scale,

Fig. 6, is a sectional elevation taken on the line 6—6 of Fig. 1,

Fig. 7, is an elevation partly in section showing the printing member, the said member being in locked position,

Fig. 8, is an elevation looking from the right of Fig. 5, and

Fig. 9, is a development of the printing block.

The printing apparatus comprises a frame composed of two side plates 56, a printing member 61 adapted to be passed into the printing apparatus through a circular hole 57 made in one of the plates 56, a platen 49 in the form of a cylinder mounted on a shaft 62 and cooperating with the printing member 61, a pair of feed rollers 43, 45 adapted to supply a web of paper 46 to the printing member 61, a spool on which the web of paper is wound, a pair of scissors 47, 48 adapted to cut a ticket from the web of paper, and a main driving shaft 36 mounted in the side plates 56 and carrying a sprocket wheel 63 adapted to be rotated from a motor 60 by means of a sprocket wheel 64 and a chain 65. The printing apparatus is mounted on a table 59 having the motor 60 fixed to its bottom side, and it is located at the side of a gate 55 through which the attendant sells the tickets, a chute 99 being provided for delivering the printed tickets to the attendant.

The printing member has been shown in Figs. 1 to 4. As shown in the said figure, the said printing member comprises a cylindrical drum made in two sections 1 and 1' fixed to each other and formed with axial trunnions 3 and 7 respectively, and having a segmental printing block 2 fixed thereto. The trunnion 3 is rotatably mounted in a circular plate 4 corresponding to the opening 57. On the trunnion 7 a ring 6 is rotatably mounted, and the said ring is connected with the circular plate 4 by means of a segmental plate 5 normally covering the printing block 2, and adapted to be turned relatively to the said printing block so as to uncover the same for printing. Normally such turning movement of the segmental plate 5, the ring 6 and the plate 4 is prevented by suitable locking means. As shown in Fig. 1, the said locking means are in the form of spring-pressed locking bolts or tumblers 8 disposed in radial bores 66 of the ring 6 and adapted to be projected by the said springs into corresponding bores 67 made in the trunnion 7,

the said bores 67 containing pins 69 of different lengths adapted to be pushed inwardly by the bolts 8. Thus, when the bolts 8 have been projected into the position shown in Fig. 7, the ring 6 and the segmental plate 5 are locked in position relatively to the trunnion 7 and the drum 1, so that the printing block 2 cannot be uncovered. For unlocking the ring 6 and the plate 5 a key 9 is pushed into a slot 10 made in the trunnion 7, the said slot having a specific form corresponding to the cross-section of the key. Thus, the ring 6 can be unlocked only by means of the correct key the cross-section and the bit 68 of which corresponds to the form of the slot 10 and the length of the pins 69. The key 9 is fixed to a part of the printing apparatus, and it is located within the same in position for engagement with the slot 10 when inserting the printing member, as will be described hereinafter.

The plate 4 is made integral with a handle 13 formed with a cavity 70, and within the said cavity any known or preferred counting apparatus is mounted, which is adapted to be operated by means of a bevel gearing 12 meshing with a bevel gearing 11 keyed to the outer end of the trunnion 3. The counting apparatus is adapted to display the numbers set thereon through a peep hole 14 shown in Fig. 8. When rotating the drum 1 for printing a ticket in the manner described herein-after, such rotary movement is transmitted to the counting apparatus, which therefore records each operation of the printing member and displays the total number of the operations. At the left of the said peep hole the handle 13 contains a record 15 corresponding to the subject matter to be printed by the printing member. If the printing member is used for printing railway tickets, the said record may indicate the end station and the class of the car corresponding to the ticket.

The printing block 2 is associated with means for printing consecutive numbers of the tickets. As shown, the said printing apparatus consists of disks 16, 16' mounted on a shaft 17 rotatably mounted in the drum 1, the disk 16' located at the right of the set being fixed to the said shaft, while the other disks 16 are loosely mounted thereon. The disks 16 and 16' are provided at their circumferences with types representing the figures from 1 to 9 and the zero sign. To the shaft 17 a gear wheel 18 is keyed, which is adapted for engagement with a single tooth 19 fixed to the plate 4. The gear wheel 18 comprises ten teeth. Therefore, when once rotating the drum 1 relatively to the plate 4 for printing a ticket, the single tooth 19 advances the gear wheel 18, the shaft 17 and the disk 16' located at the right of the set a distance corresponding to the distance between two consecutive figures provided on the disk. To the left hand faces of the disks 16 and 16' single tooth

wheels 71 are fixed, and to the right hand faces of the disks 16 gear wheels 72 are secured. Parallel to the shaft 17 a spindle 73 is mounted in the drum 1, and on the said spindle gear wheels 74 are loosely mounted which are in mesh with the gear wheels 72, and which are adapted for engagement with the single tooth wheels 71. Thus, after a disk 16 or 16' has completed a rotation, and the printing types pass from 9 to zero, the next disk is advanced one step.

The printing apparatus has been shown in Figs. 1 to 4. The printing member 61 and platen 49, the feed rollers 43, 45 and the blades 47, 48 are driven from the shaft 36, which is continuously rotated by means of the motor 60. On the said shaft a cam disk 32 is rotatably mounted which is adapted to be coupled with the shaft by means of a pawl 33 rockingly mounted thereon and adapted for engagement with a ratchet wheel 35. Normally the said pawl is held out of engagement with the ratchet wheel by means of a bell crank lever rockingly mounted at 28, one arm 29 of the said bell crank lever being in the form of a hook engaging the tail end of the pawl 33, and the other one 30 carrying a roller 31 adapted for engagement with a cam face 75 formed on the disk 32. The said bell crank lever is acted upon by a spring 92 tending to rock the same in clockwise direction and to retract the hook-shaped arm 29 out of engagement with the pawl 33 and to rock the roller 31 into engagement with the cam face 75. The pawl 33 is acted upon by a spring 93 bearing on a lug 76 fixed to the disk 32, and the said spring tends to rock the pawl into locking engagement with the ratchet wheel 35. The bell crank lever is formed with a tail 77 engaged by a lever 26, the said lever normally holding the arm 29 in the position shown in Fig. 1 in which the pawl 33 is out of locking engagement with the ratchet wheel 35. Through a bore of the said lever a link 25 is passed which engages the said lever with a head 78, and between the lever and a lug 79 fixed to one of the plates 56 there is a spring 54 tending to hold the lever 26 in locking engagement with the bell crank lever 29, 30. The link 25 is attached to the bottom end of a slide 24 guided in suitable guide members 80 and normally held in its lowermost position by the spring 54. The slide 24 is formed with a slot 81 permitting the passage of the ticket therethrough, and it is adapted to be lifted by means of a tooth 23 projecting into the slot 81 and fixed to the ring 6 of the printing member. Therefore, when inserting the printing member into the printing apparatus and turning the parts 4, 5, 6 thereof by means of the handle 13, the slide 24 is lifted by means of the tooth 23, so that the lever 26 releases the bell crank lever 29, 30 and permits the same to be rocked out of locking engagement with the tail end of the

pawl 33, which is therefore rocked by the spring 93 into locking engagement with the ratchet wheel 35.

Coaxially of the drum 1 a gear wheel 42 is rotatably mounted on one of the plates 56, and to the said gear wheel the key 9 is fixed, which is adapted to operate the pins 69 and the bolts 8, as has been described above. The gear wheel 42 is in mesh with a gear wheel 41 keyed to the shaft 62 carrying the platen 49. The disk 32 is made integral with a gear wheel 37, which is connected by means of gear wheels 38, 39, 40, 44 with the gear wheel 41 and with the feed rollers 43, 45.

The web of paper taken from the roll 46 thereof is passed into the printing apparatus through a guide slot 83 provided between blocks 84 fixed to the side plates 56, and after leaving the feed rollers 43, 45 it is passed through a slot 85 provided between blocks 86 and 87. The block 87 is formed with a cylindrical cavity adapted to receive the printing member 61. The blade 48 is fixed to the block 86, and the blade 47 is fixed to a bar 88 guided in slots made in the blocks 86 and 87, and it is connected by a link 50 to a lever 51 rockingly mounted at 89 and carrying a roller 52 engaging in a cam groove 53 of the disk 32, the cam groove being shaped so as to impart cutting movement to the bar 88 and the blade 47 carried thereby.

The numeral 95 indicates an inking apparatus for the printing block 2. The disk 32 is formed with a notch 96 adapted to be engaged by a pawl 97 rockingly mounted at 89, the object of the said pawl being to prevent rotary movement of the disk 32 by the spring 93 when the pawl 33 is in the position shown in Fig. 1.

To the casing of the printing member provided by the segmental plate 5, the disk 4 and the ring 6 a lug 20 is fixed, and the block 87 is provided with a slot 21 disposed longitudinally of the recess formed in the said block, and at its inner end the said slot is formed with a short circumferential extension.

The operation of the apparatus is as follows: The motor 60 is continuously rotated, and it is normally disconnected from the printing mechanism, the pawl 33 being held out of coupling position by the bell crank lever 29, 30. If it is desired to print a certain ticket the printing member 61 corresponding thereto is taken from a shelf or the like and inserted through the opening 57 into the cylindrical cavity of the block 87, the lug 20 passing through the slot 21 thus guiding the printing member within the cavity in the proper position. The key 9 enters the keyhole 10 made in the trunnion 7 and it engages the pins 69 thus pushing the bolts 8 outwardly and into the unlocking position shown in Fig. 5. Now the casing 4, 5, 6 and the drum 1 are capable of being rotated rela-

tively to each other. By turning the said casing in clockwise direction the finger 23 engages the slide 24 and elevates the same. Thereby the lever 26 is rocked against the action of the spring 54, thus releasing the bell crank lever 29, 30 which therefore releases a pawl 33 and allows the same to be rocked into coupling engagement with the ratchet wheel 35. Thus the motor 60 and the shaft 36 are coupled with the printing mechanism. By the gear wheels connected with the disk 32 the printing drum 1 and the platen 49 and the feed rollers 43, 45 are rotated in the direction of the arrows x and y , the key 9 transmitting rotary movement from the gear wheel 42 to the drum 1, 1'. During the first part of the said rotary movement through an angle of nearly 180° the feed rollers 43, 45 and the printing drum 1 are out of engagement with the strip of paper, which therefore is not advanced. The disk 32 rotating in the direction of the arrow z through an angle of about 120° operates the pair of scissors 47, 48 by means of the lever 51 and the link 50, so that a previously advanced strip of paper or card board is cut from the web 46. Shortly thereafter the feed rollers 43, 45 and the drum 1 engage respectively the web 46 and the cut strip of paper thus advancing the said web and strip and printing the strip. When releasing the tail end of the pawl 33 the bell crank lever 29, 30 engages with its roller 31 the portion of smaller radius of the circumferential cam face 75 of the disk 32, and it is gradually rocked thereby in anti-clockwise direction by being engaged by the portion of larger radius, so that it is again in position for being locked by the lever 26. If it is desired to print a single ticket the casing 4, 5, 6, which has been rocked in clockwise direction for lifting the slide 24, is immediately returned into initial position for releasing the slide 24. Therefore, the lever 26 is adapted to be rocked by the spring 54 into locking engagement with the tail end 77 of the bell crank lever 29, 30, and it locks the said bell crank lever in the position shown in Fig. 1 after the cam disk 32 has rocked the same. Thus, when the tail end of the pawl 33 arrives again in the lowermost position shown in Fig. 1, the arm 29 rocks the pawl out of coupling engagement with the ratchet disk 35, so that the printing mechanism is arrested. If, however, it is desired to print several tickets the casing 4, 5, 6 is held by the attendant in position for holding the slide 24 in elevated position. Therefore, the lever 26 is held out of position for reengaging the tail 77, so that the bell crank lever 29, 30 is rocked by the spring 92 in clockwise direction before the tail end of the pawl 33 engages the hook-shaped arm 29, the roller 31 being thrown into engagement with the portion of reduced radius of the circumferential cam face of the disk 32.

The printed tickets delivered from the platen 49 and the printing drum 1 pass through the chute 99 and on the table 59.

By the rotary movement imparted to the drum 1 by the printing mechanism the counter enclosed within the handle 13 is operated through the intermediary of the trunnion 3 and the gearing 11, 12, the said counter counting the number of rotations of the drum and therefore the number of the tickets printed by means of the said printing member. Further, upon each rotation of the drum the gear wheel 18 is engaged by the single tooth 19, so that consecutive numbers are set on the type disks 16', 16 for being printed upon the ticket.

At the end of the printing operation by means of the printing member inserted into the printing apparatus the said printing member is retracted away from the printing apparatus. Thus the key 9 disengages the pins 69, so that the bolts 8 are forced by their springs into locking engagement with the trunnion 7.

While in describing the invention reference has been made to a particular example embodying the same I wish it to be understood that my invention is not limited to the construction shown in the drawings, and that various changes may be made in the general arrangement of the apparatus and the construction of its parts without departing from the invention.

I claim:

1. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types and provided with axial trunnions, a cylindrical member rotatably mounted on said trunnions and extending over a part only of the circumference of said drum and normally covering said types, locking mechanism for locking said cylindrical member relatively to one of said trunnions, said trunnion having said cylindrical member locked thereto being provided with a keyhole through which said locking mechanism is accessible, and a key associated with said printing mechanism and adapted when mounting said printing member thereon to pass into said keyhole of the printing member and to unlock the cylindrical member thereof.

2. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types and formed with axial trunnions, a cylindrical member rotatably mounted on said trunnions and extending over a part only of the circumference of said drum and normally covering said types, locking mechanism for locking said cylindrical member relatively to one of said trunnions, said trunnion having said cylindrical member locked thereto being provided with a keyhole through which said locking mechanism is accessible,

and a key associated with said printing mechanism and adapted when mounting said printing member thereon to pass into said keyhole of the printing member and to unlock the cylindrical member thereof, said key being fixed to a rotary member of the printing mechanism and adapted to transmit rotary printing movement to said printing member.

3. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types and formed with axial trunnions, a casing rotatably mounted on said trunnions and normally covering said types, means for locking said casing on said drum, means associated with said printing mechanism and operative when mounting said printing member thereon for releasing said casing, a handle projecting axially from said casing and formed with a cavity, and a counting mechanism within said cavity and operatively connected with said drum.

4. An apparatus for printing tickets, comprising a printing mechanism and its driving member, means for coupling said driving member and printing mechanism, a printing member in the form of a drum carrying types, a device rotatably mounted on said drum and normally covering said types, locking means for normally locking said device on said printing member in position for covering said types, means associated with said printing mechanism and operative when mounting said printing member thereon for releasing said device, and means on said device operative when turning the same relatively to said drum for throwing said coupling means into coupling position.

5. An apparatus for printing tickets, comprising a printing mechanism and its driving member, means for coupling said driving member and printing mechanism, a printing member in the form of a drum carrying types, a device rotatably mounted on said drum and normally covering said types, locking means for normally locking said device on said printing member in position for covering said types, means associated with said printing mechanism and operative when mounting said printing member thereon for releasing said device, said releasing means being operatively connected with said driving member for being rotated thereby and adapted for driving engagement with said printing member, and means on said device operative when turning the same relatively to said drum for throwing said coupling means into coupling position.

6. An apparatus for printing tickets and the like, comprising a printing mechanism, a removable printing member carrying types, a device on said printing member adapted to cover said types for rendering the same inoperative, a locking member movable inde-

pendently of said printing member and device and adapted to lock said device relatively to said printing member in position for covering said types, and means associated with said printing mechanism and operative when mounting the printing member thereon for setting said locking member into non-locking position.

7. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types, a cylindrical member rotatably mounted on said drum and extending over a part only of the circumference of said drum and adapted to cover and uncover said types, a locking member shiftable radially of said drum and cylindrical member and normally locking said drum and cylindrical member relatively to each other with the cylindrical member in position for covering said types, said drum being formed with an axial keyhole through which said locking member is accessible, and a key associated with said printing mechanism and adapted when mounting said printing member thereon to pass into said keyhole and to shift said locking member into unlocking position.

8. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types, a cylindrical member rotatably mounted on said drum and extending over a part only of the circumference of said drum and adapted to cover and uncover said types, a locking member shiftable radially of said drum and cylindrical member and normally locking said drum and cylindrical member relatively to each other with the cylindrical member in position for covering said types, said drum being formed with an axial keyhole through which said locking member is accessible, and a key associated with said printing mechanism and adapted when mounting said printing member thereon to pass into said keyhole and to shift said locking member into un-

locking position, said key being fixed to a rotary member of the printing mechanism and adapted to transmit rotary printing movement to said printing member.

9. An apparatus for printing tickets and the like, comprising a printing mechanism, a removable printing member carrying types and having a hollow handle, locking means on said printing member for normally rendering the types inoperative, means associated with said printing mechanism and operative when mounting said printing member thereon for releasing said locking means, and a counting mechanism connected with said printing member disposed within the cavity of said handle and adapted to record the printing operations of the printing member.

10. An apparatus for printing tickets, comprising a printing mechanism, a printing member in the form of a drum carrying types, a cylindrical casing rotatably mounted on said drum and adapted to cover and uncover said types, means for locking said casing on said drum in position for covering said types, means associated with said printing mechanism and operative when mounting said printing member thereon for releasing said casing, a hollow handle projecting from said casing, and a counting mechanism within said handle and operatively connected with said drum.

11. An apparatus for printing tickets and the like, comprising a printing mechanism and its driving member, means for coupling said printing mechanism with said driving member, a printing device carrying types and adapted to be mounted on and operated by said printing mechanism, and means adapted to be operated by said printing device after mounting the same on said printing mechanism for throwing said coupling means into coupling position.

In testimony whereof I hereunto affix my signature.

FRITZ ELLER.