F. SKERL.

TICKET PRINTING MACHINE.

APPLICATION FILED MAY 7, 1913.

1,307,603.

Patented June 24, 1919.

6 SHEETS—SHEET 1.

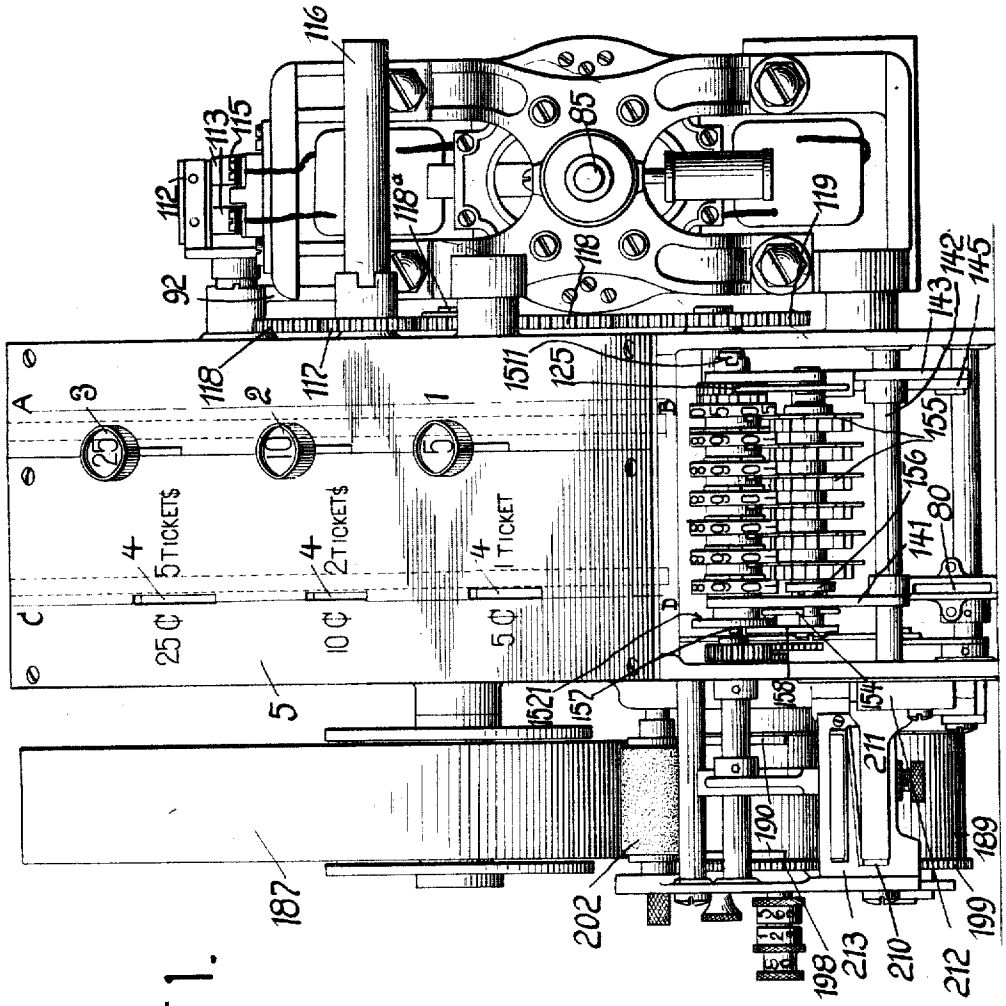


Fig. 1.

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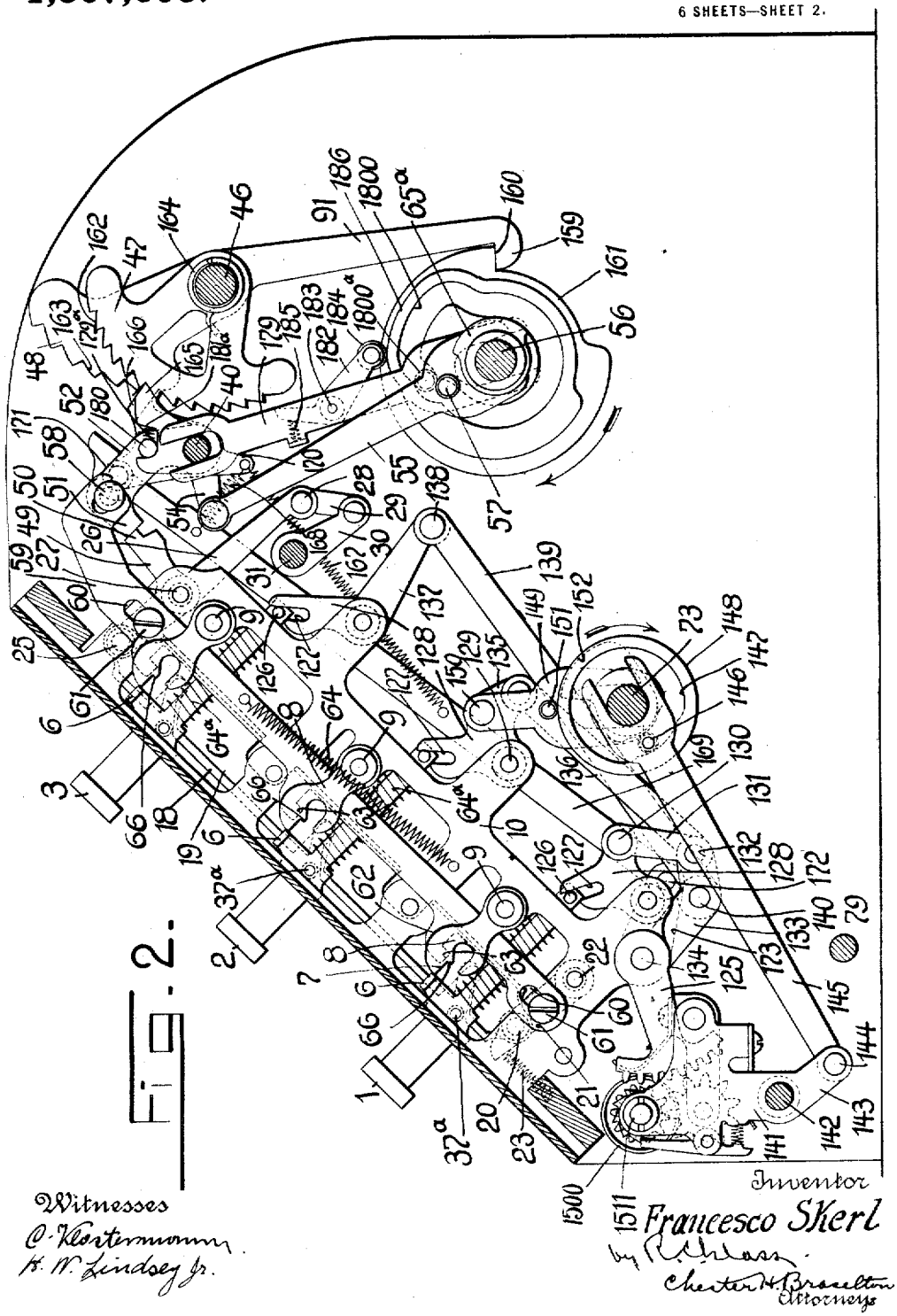


Fig. 2.

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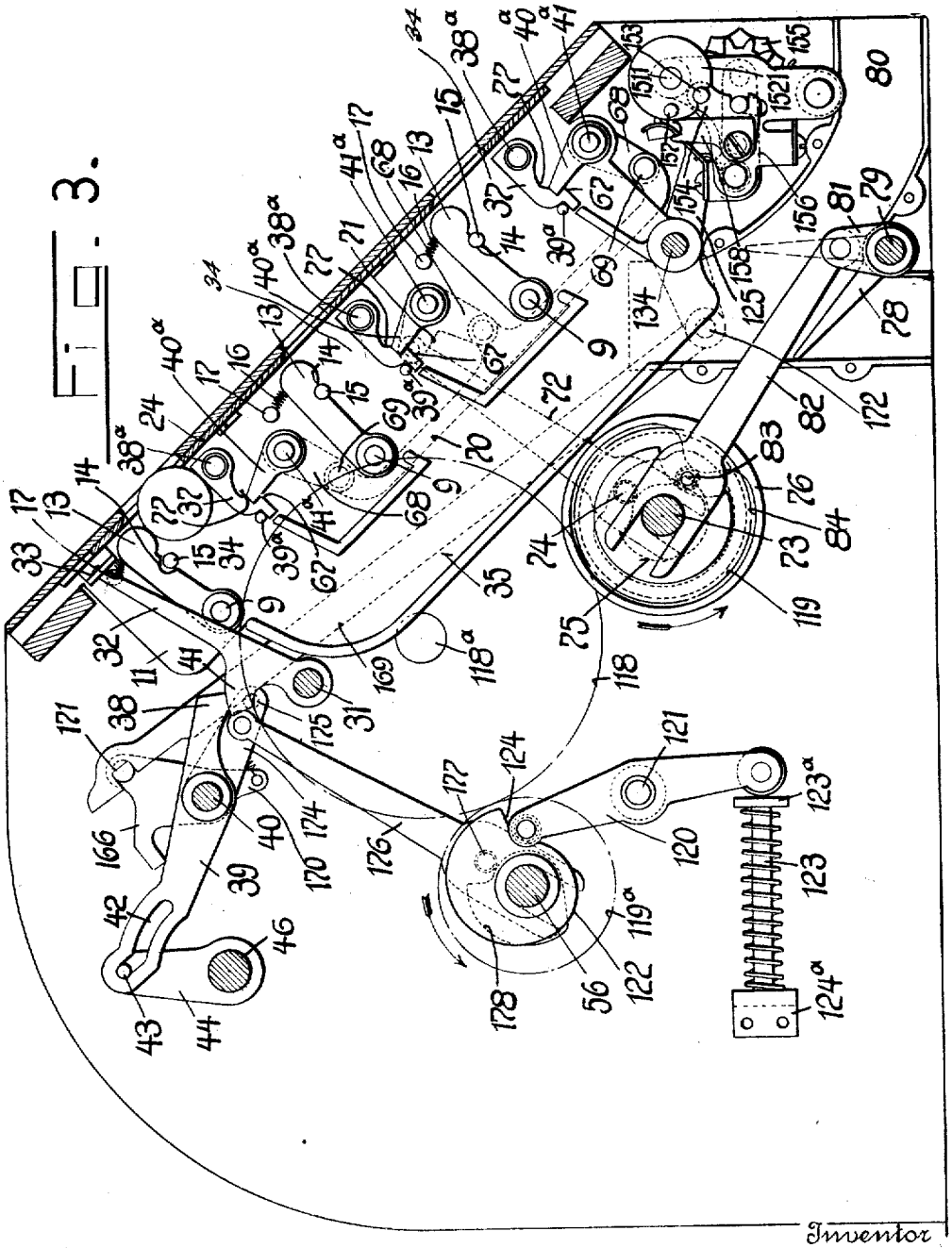
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6 SHEETS—SHEET 3.

Fig. 3.



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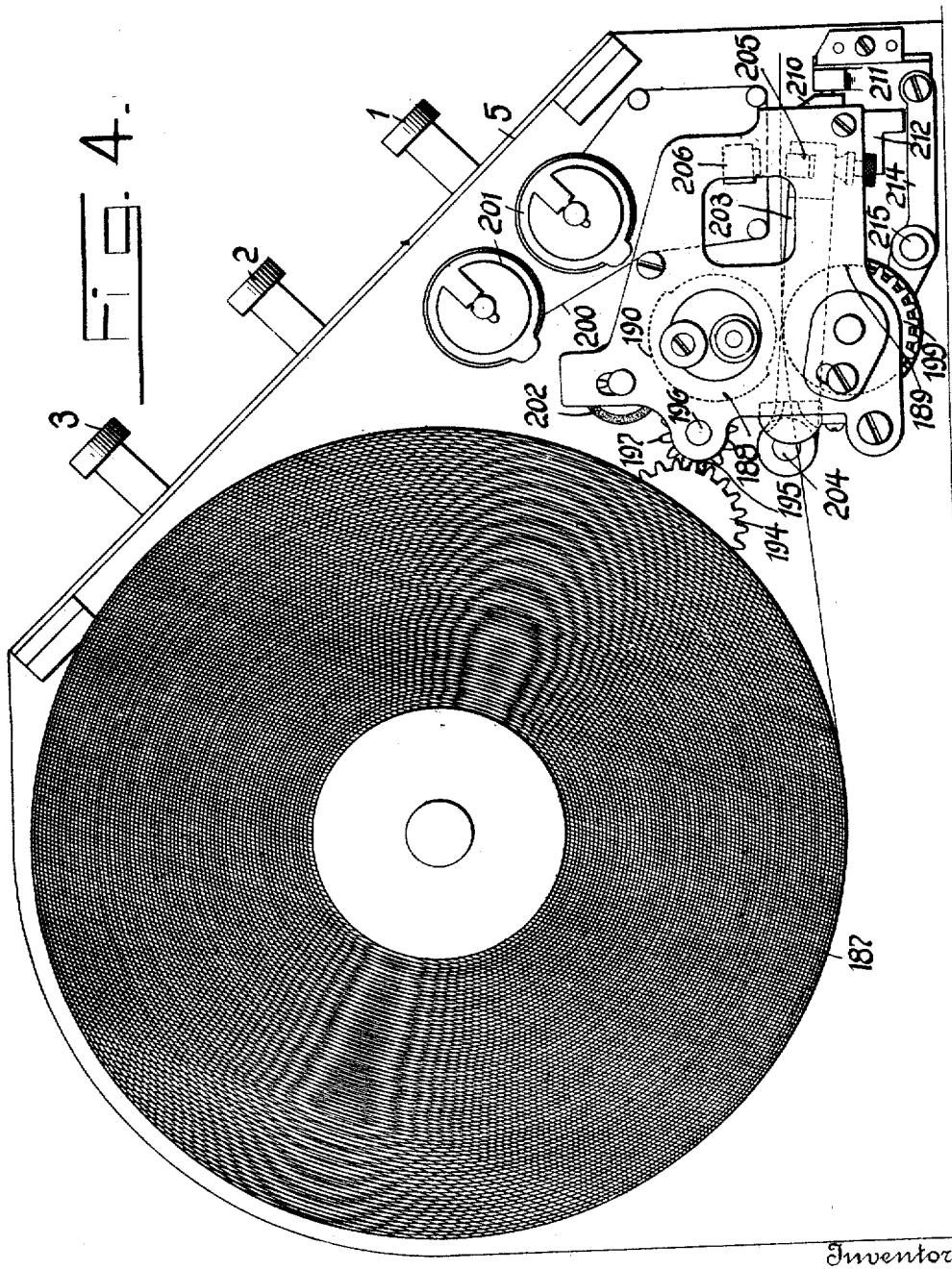
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6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

Fig. 5.

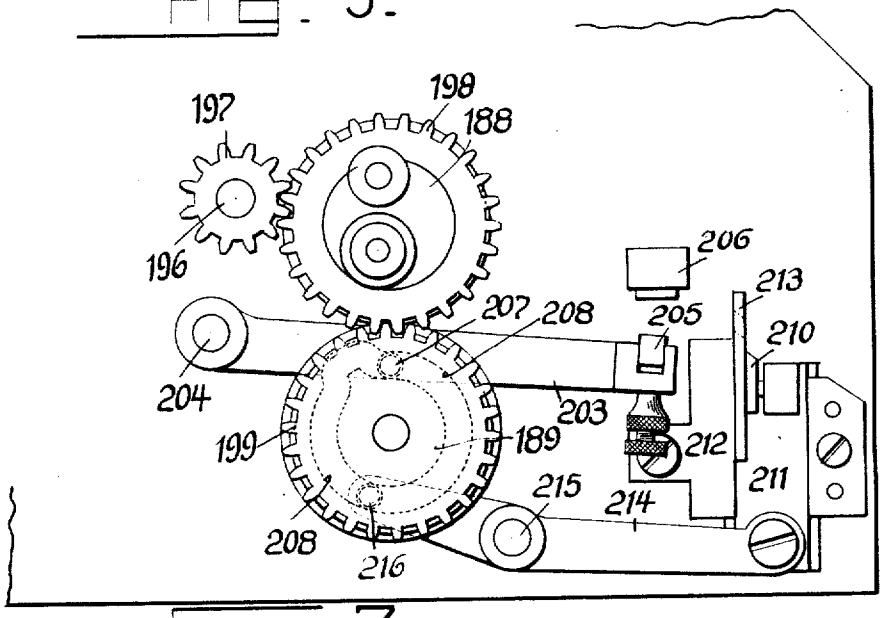


Fig. 7.

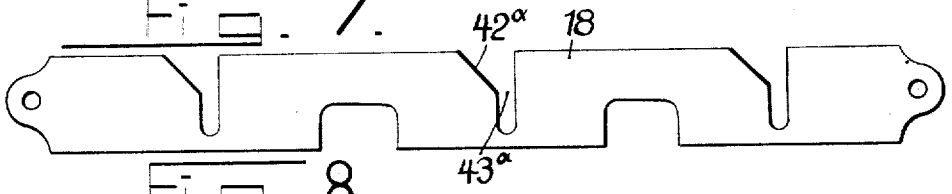


Fig. 8.

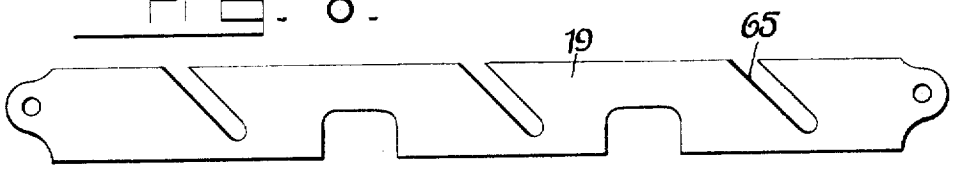
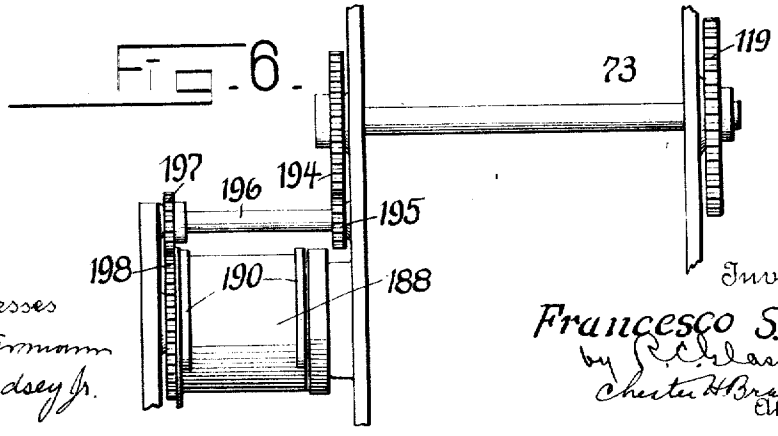


Fig. 6.



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6 SHEETS—SHEET 6.

Fig. 9.

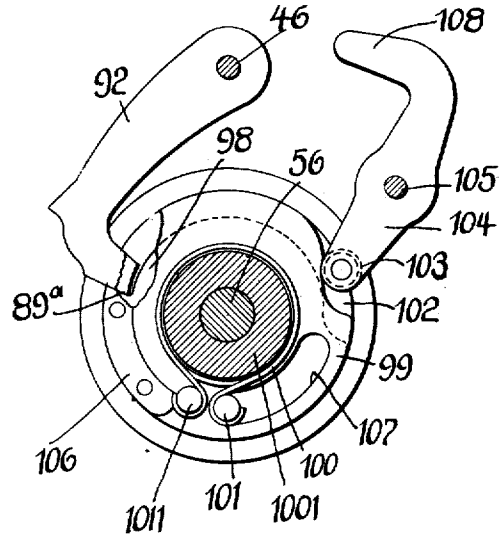
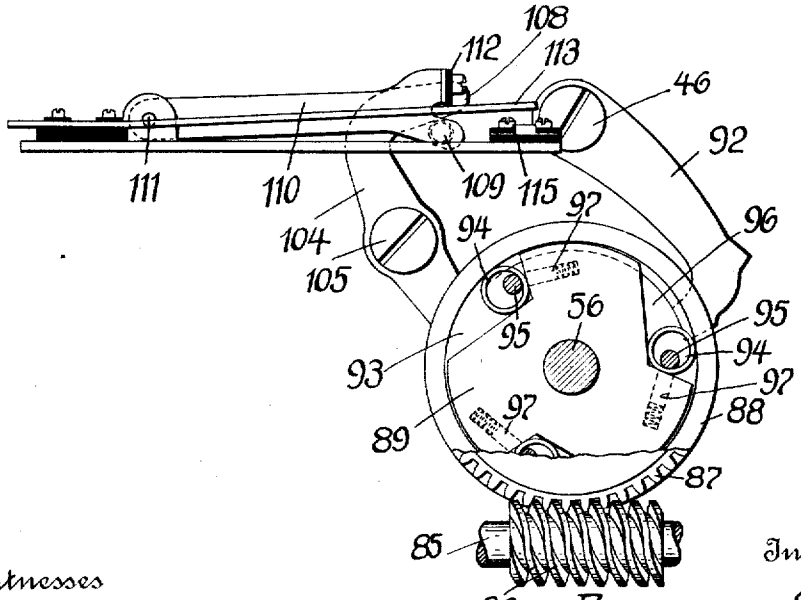


Fig. 10.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCESCO SKERL, OF DAYTON, OHIO, ASSIGNOR TO THE NATIONAL CASH REGISTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

TICKET-PRINTING MACHINE.

1,307,603. Specification of Letters Patent. Patented June 24, 1919.

Application filed May 7, 1918. Serial No. 766,054.

To all whom it may concern:

Be it known that I, FRANCESCO SKERL, a citizen of Austria, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Ticket-Printing Machines, of which I declare the following to be a full, clear, and exact description.

This invention relates to ticket issuing machines and more particularly to that class adapted to issue one or more tickets of the same denomination at one operation of the machine.

One of the chief sources of loss to the owners of theaters, moving picture shows, and the like, and also in ticket offices of elevated, subway and other railways as well as other transportation systems, and in fact wherever tickets are sold and used, is the dishonesty practised by ticket sellers in reselling tickets which have been used. To prevent such dishonesty separate ticket takers are usually employed, but it has been found that this is not always an effectual check upon the ticket seller, as the employee who collects the tickets can, by collusion with the seller return them to the seller who can again sell them. Employment of two or more persons to prevent reselling of used tickets is furthermore quite an item of expense which, of course, the owners of such places wish to avoid. Various methods have been devised to prevent such dishonesty, but most of them are defective inasmuch as they leave a channel by which the proprietor can be defrauded either by one of his employees or by the purchaser.

The principal object therefore of this invention is to provide a machine whereby the above losses can be eliminated as well as the expense of ticket selling employees, still retaining in use a system in which one or more tickets as desired can be promptly obtained by the purchaser.

It is then an object of this invention to provide a ticket issuing machine adapted to issue tickets only when coins of the proper value are inserted into it, and more particularly to provide such a machine in which one or more tickets as desired can be obtained at one operation.

Another object of the invention is to embody in such a machine mechanism for printing the tickets as they are issued thereby eliminating the carrying of large numbers of valid tickets which might at any time be subject to theft and use.

While this is not essential to the broad invention, manipulative means are employed in the machine shown which are adapted to coöperate with the inserted coins to control the issuing of the tickets and the operation of the machine. The means has taken the form of a series of keys but other manipulative means may be employed instead, such as an adjustable lever.

It is too, an object of the invention to embody in such a machine, totalizing mechanism in which the total value of coins inserted in the machine is caused to be accumulated.

Other objects for the specific constructions disclosed are to provide for preventing depression of a key until a coin of proper value is inserted in the machine, and for completely preventing operation of the machine until both the proper coin is inserted in it and the corresponding key depressed. These have been accomplished in part by provision of two detents, the movement of one of which permits the locking of the depressed key and unlocks parts of the machine, while the movement of the other closes the coin slots to prevent insertion of more coins until the operation of the machine is completed.

The machine has been shown as capable of operation from a motor as well as from a crank and an additional object of the invention is to provide improved connections between the motor and the machine proper whereby the duration of operation of the motor and machine is controlled from the keys to determine the number of tickets to be issued.

With these and incidental objects in view, the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims, and a preferred form of embodiment of which is hereinafter described with reference to the drawings which accompany and form part of this specification.

In using a system based upon the herein described machine, when a customer desires to obtain one or more tickets, a coin, the value of which is equal to the price of one

ticket multiplied by the number of tickets desired, is inserted into the machine. The operation of the key corresponding to the amount of the coin inserted, through the movement of detents, actuates plates which close the slots against insertion of other coins and lock the depressed key in its depressed position. An actuating rack for a totalizer is differentially positioned according to the key depressed at the same time, and the extent of movement of this rack also determines the extent of movement of a spring actuated member, which normally locks the machine from operation. When this member has been differentially moved, the crank handle, if the machine is to be so operated, is turned and the operating mechanism given a number of cycles of movement depending on the number of tickets to be issued. If the motor, as shown in the accompanying drawings, is employed to drive the operating mechanism, the locking lever for the clutch connections of the motor is rigid with the locking member and will be given a like differential setting to control the extent of operation of the motor and therethrough determine the cycles of movement of the operating mechanism. During the first cycle the amount inserted is added on the totalizer and the depressed keys released, but the slots are closed by the locking plate to prevent further insertion of coins until the last ticket is issued. Upon each cycle a ticket is printed by the printing mechanism and severed by a knife, and the locking member is returned one step toward its locking position. When the last ticket has been issued the locking member is rendered effective until the next operation if the machine.

As shown in the accompanying drawings, and described in the specification, the particular machine shown is capable of printing one, two, or five 5¢ tickets. It is, of course, to be understood that a machine can be constructed to issue tickets of any denomination and of any number. The denomination of the ticket shown in the drawings is merely used for convenience, as the machine is particularly adapted for use in moving picture shows where the price of admission is 5¢.

Referring to the accompanying drawings,

Figure 1 is a front elevation of a machine constructed according to the invention with the cabinet removed.

Fig. 2 is a transverse vertical section taken on the line A—B (Fig. 1).

Fig. 3 is a transverse vertical section taken through the series of coin slots of Fig. 1, on the line C—D looking toward the right in said figure.

Fig. 4 is an elevation of the left side of the machine.

Fig. 5 is an enlarged detail view of the printing mechanism.

Fig. 6 shows the arrangement of gearing employed for driving the printing mechanism.

Figs. 7 and 8 respectively show the detents employed to operate the slot locking plate, and to release the key locking plate and certain parts of the operating mechanism.

Figs. 9 and 10 are detail views of the clutch connections of the motor.

Keys 1, 2, and 3 represent the nickel, dime, and quarter keys respectively which respectively control the issuance by the machine of one, two, or five tickets. Three coin slots 4, one for each key, are formed in a plate forming part of the keyboard 5 of the machine. As it is desirable that a coin be inserted into its proper slot before the corresponding key can be operated a device normally locking the keys and under the control of inserted coins has been provided. To this end the keys carry projecting lugs 6 which are normally in engagement with the extreme ends of notched dogs 8 fast on shafts 9. These shafts are supported by frames 10 and 11 which are suspended from the casing 5 of the machine. On the same shafts, but laterally of the machine and beneath the coin slots, are rigidly mounted arms 13, each of which has a notch 14 normally located over a pin 15 projecting from the frame 11, and engages at its upper side with one end of a compressed spring 16 which, at its other end, is secured to a pin 17, also projecting from the frame 11 (Fig. 3). These arms are so constructed that the upper ends project slightly into the path of coins inserted in corresponding coin slots so that when the coin is inserted it rocks the adjacent arm 13 and, by reason of the latter being rigid with its supporting shaft 9, and therefore with the dog 8 supported thereby, causes the latter to be moved about its shaft to carry its extreme end 7 from engagement with the lug 6 of its adjacent key so as to permit depression of the latter. By this construction only the key corresponding to the slot in which the coin has been inserted is unlocked for depression.

The machine is provided with two detents 18 and 19 adjacent to the row of keys, and the detents are supported at their lower ends 20 by individual arms 21 (Fig. 2) loose on a rod 22 projecting from the frame 10. The under sides of these arms contact with springs 23, one for each arm, which are backed by the frame of the machine and yieldingly act against the arms 21 to hold the detents in their normal upper positions. The detent 18 (Figs. 2 and 7) is employed to actuate a sliding plate 24 (Fig. 3) whereby the coin slots are closed during the operation of the machine, and to this end this detent is pivotally secured at 25 to one end of a lever 26 which is pivoted to a rod 27 projecting from the frame 10. To the lower end of this lever

is connected at 28 a link 29 which connects the lever to an arm 30 fast on a shaft 31. Rigid with the same shaft is an arm 32 (Fig. 3) which, at its upper end, projects through a slot in a lug 33 projecting from the plate 24 for the coin slots, slidably mounted on the under side of the casing 5 by slot and pin connections. This plate is provided with slots of the same shape as those in the casing 5 and with which they normally coincide so that coins can be inserted through them into auxiliary guideways 34 leading to a common coin guideway 35. When the coins have been barely inserted into the auxiliary guideways 34 of the machine, if they are not frictionally held by engagement with arms 13, they are retained in the guideways 34 by pins 15, projecting from the side of the auxiliary guideway, and opposing arms 37, pivoted at 38^a and normally held with their lower ends against pins 39^a by arms 40^a pivoted at 41^a to the sides of the frame. The arms 37 and pins 15 are normally so close together that coins can pass between them only when the arms 37 are released by their arms 40^a and allowed to move slightly out of the auxiliary guideways under the pressure of the coins.

When a key is depressed after having been released by insertion of a coin in the adjacent slot, the detent 18, due to the contact of roller 37^a projecting from the side of the key with the inclined surface 42^a of notch 43^a in the detent beneath the depressed key, will be moved downwardly and the shaft 31, through the lever 26 and the link 29, will be rocked and thereby the arm 32 will be lowered. This movement of the arm, through its engagement in the slot of the lug 33, lowers the sliding plate 24 and thereby closes the coin slots against the insertion of the coins during the operation of the machine. This coin slot closing plate is held in closing position until the end of the operation of the machine by the engagement of the forward end 38 of a lever 39, mounted on the shaft 40, with a projection 41 on the arm 32. This lever is loosely pivoted on the shaft 40 and at its rear end is provided with a slot 42 into which extends a pin 43 projecting from an arm 44 mounted rigidly on a shaft 46 to which a ratchet 47 and a stepped plate 48 (Fig. 2) are also fast. This ratchet and plate and therefore the arm 44 are adapted to be given one, two or five units of movement dependent upon the key depressed, as will be hereinafter described. The slot 42 is so constructed that the first unit of movement of the arm 44 rocks the end 38 of the lever 39 beneath the projection 41 of the arm 32 after the latter has been moved to close the coin slot, while further movement of the arm retains the lever in such position. Upon the last return unit of movement of the arm 44 toward its initial position, at the end of the operation of the machine, the lever will be rocked out of locking position, and the sliding plate allowed to be returned to normal position by the return of detent plate 18 to normal position by its spring 23.

The other detent 19 is employed to release a device which is employed to lock a key in its depressed position. At its upper end the detent is secured to a bell crank lever of which 49 is one arm. This arm carries a shoulder 50 which normally is in engagement with a projection 51 on one arm 52 of a bell crank loosely mounted on a shaft 40, the other arm 54 being secured to the upper end of a pitman 55. The lower end of this pitman is forked and straddles a main drive shaft 56 and carries a projecting roller 57. The arm 52 at its outer end carries a projecting pin 58 straddled by the bifurcated projection of a plate 59, which has elongated slots 60 through which pass screws 61, projecting from frame 10. This plate is provided with extensions 62 which in turn carry projecting lugs 63, one of these projections being provided for each key. A spring 64, which is secured to this plate and to the frame 10, is constantly under tension and tends to pull the plate 59 in a downward direction, but the engagement of the arm 49 with the projection 51 on the arm 52, which is connected through pin 58 with this plate, normally prevents such movement. When the key is depressed, however, the detent 19 is given a downward movement by the engagement of the roller 37^a on the key in the corresponding inclined slot 65 in the detent and rocks the bell crank supporting its upper end, in a counter-clockwise direction thereby carrying the arm 49 out of engagement with the projection 51. When this is accomplished the spring 64 moves the plate 59 downward and causes the lug 63 to pass over the lug 6 on the depressed key and thereby hold this key in its depressed position.

As the plate 59 is connected by the pin 58 to the arm 52 of the bell crank loosely mounted on the shaft 40, the downward movement of this plate rocks the bell crank counter-clockwise to carry the arm 54 downward about its pivotal center thus forcing the roller 57 on the pitman 55 into engagement with the periphery of a cam 65^a. The keys are released upon the first rotation of the main drive shaft 56 to which is fast the cam 65^a as this cam is so constructed that the pitman, when the latter's roller 57 is in engagement with it, is given a slight movement in the direction of its length moving the bell crank pivoted on the shaft, clockwise to normal position and hence restoring the plate 59 to its normal position. The spring 23 connected to the detent 19 then moves the latter to its normal position,

the key through the spring 64ª coiled about its shank is returned to undepressed position, and the arm 49 is brought into locking position by engaging the projection 51 on the arm 52.

These detents 18 and 19 are so constructed and positioned that the roller 37ª on the key depressed engages first with the inclined face 42ª of the notch 43ª in the detent 18 and gives the locking plate 24 a partial movement before the roller engages the adjacent inclined slot in the other detent 19 so that a wire or a sharp instrument would be taken out of engagement with the arm 13 should it be attempted to use the same for rocking the latter to unlock the keys, a shoulder 66 on each dog 8 being provided so that the key in such case could only be partially depressed as the lug 6 on the key would engage therewith.

The coin is held in its unlocking position between the pin 15 and the arm 37 so that the key may be operated after the insertion of the coin. When the key is operated and the coin slots locked, the following device is employed to release the coin so that the same may pass through the auxiliary coin guideways 34 and main guideway 35 into a coin receptacle (not shown). The arms 37 are loosely mounted on studs 38ª projecting from the inside of the coin guideway frame and are held in normal position by the engagement of the arms 40ª with shoulders 67 on the lower ends of the arms 37. In this normal position the arms 37 are also in engagement with the pins 39ª projecting from the coin guideway frame. Each of these arms 40ª is fast to a sleeve surrounding its stud 41ª projecting from the same frame. Arms 68 are also fast to these same sleeves and at their lower ends are pivotally connected at 69 to a link 70. The middle arm 68 forms part of a bell crank to the other arm 71 of which is secured a pitman 72 which at its lower end is bifurcated and straddles a shaft 73. A roller 74 carried by the pitman rides in a cam groove 75 (shown in dotted lines) in one side of a disk 76 whereby when the shaft 73 is rotated, as will be hereinafter described, the pitman is given a reciprocating movement and the arms 40ª are all rocked upward so that the arms 37 are allowed to drop out of the paths of coins by reason of the ends of the arms 40ª coming directly in front of curved recesses 77 in the arms 37. The coins, with the arms 37 released by the arms 40ª, have free passage through the auxiliary coin guideways.

An inserted coin cannot, however, pass completely through the main guideway to the coin receptacle until the machine is operated, as an arm 78 rigidly secured to a sleeve on a rod 79 normally closes the lower end of the main guideway 35 leading to this coin receptacle, but a branch guideway 80 to the exterior of the machine is open when the main guideway is closed. An arm 81 is fast to the sleeve on the rod 79 and at its outer end is secured to a pitman 82 which, at its other end, is forked and straddles the shaft 73. An anti-friction roller 83, carried by this pitman, rides in a cam groove 84 in the side of the disk 76 opposite that in which the cam groove 84 is located and this groove is so constructed that at the very beginning of the operation of the machine the pitman 82 is given such a movement that the arm 78 is rocked upwardly about its pivotal center to open the guideway 35 to the coin receptacle and to close the branch guideway 80 to the exterior of the machine. This device is employed so that a coin or a counterfeit which is not of sufficient size to be stopped by the pins 15 and arms 37 will pass directly and before the machine is operated through the main guideway and the branch guideway to the outside of the machine, thus not being deposited in the coin receptacle.

The machine as stated may be either operated by a crank handle or by a motor as desired. The motor shown is one well known on the market, a complete description of which is found in Letters Patent of the United States to Charles F. Kettering, No. 923,857, granted June 8th, 1909, together with Letters Patent of the United States to Charles F. Kettering and William A. Chryst, No. 1,144,418, granted June 29, 1915, but it is to be understood that any other type of motor may be employed, as this particular type is shown merely for convenience. A clutch connection for the motor is shown and described, as without such a device the throwing of a positive lock into the path of one of the moving parts would cause a great strain on the parts when the locking takes place, due to the inertia of the rapidly moving parts. With the clutch, however, the mechanism may be brought to its home position and the motor allowed to run as long as its momentum will carry it without any resulting damage to the mechanism. This clutch connection is shown in Figs. 9 and 10. The armature of the motor is on a shaft 85 integral with a worm 86 which meshes with a gear 87 carrying a hollow cylindrical part 88 forming one of the elements of the clutch. The other clutch element comprises a plate 89 rigidly mounted on the main drive shaft 56. Fast on the same shaft 46, to which ratchet 47 and stepped plate 48 are rigidly secured, are two locking arms 91 (Fig. 2) and 92 (Figs. 9 and 10), the latter of which is adapted to engage a projection, not shown, movable with the plate 89 of the clutch, and thereby serves to prevent the operation of the machine. The ratchet and stepped members 47

and 48 respectively are given a differential movement as will be hereinafter fully described.

The connections between the cylindrical part 88 and the cut-away portions 93 of the plate 89 of the clutch is accomplished by rollers 94 moving in the cut-away parts of the plate. The movement of the cylinder 88 tends to carry the rollers 94 to the narrower parts of the cut-away portions of the plate thereby firmly binding together the two parts of the clutch. These rollers 94 are mounted on pins 95 carried by a nearly circular plate 96 mounted loosely on the shaft 56 and capable of a slight movement relative to the plate 89. Plungers 97, shown in dotted lines and seated in the plate 89, are spring pressed to normally move the rollers 94 toward the narrower parts of the cut-away portion 93 of the plate. It is clear that when the ratchet 47 and stepped plate 48 are rocked that the locking arm 92 will be rocked by the shaft 46 and the locking end thereof carried away from the clutch. The locking arm 92 is also in the path of a projection on the plate 96 and the withdrawal of the arm will release the plate 96 and permit the plungers to force the anti-friction rollers to the narrower parts of their containing slots. As the end of the operation of the machine is reached the locking lever 92 is positively moved back to the locking position of the figures, as will be hereinafter explained, and the projection integral with the plate 96 will finally contact with the end of the locking arm 92 thereby stopping the plate 96. The other clutch parts, however, move slightly forward but inasmuch as this forward movement presses the springs of the plungers 97 and moves the rollers to the wide parts of their containing notches, the clutch is thereby disconnected and the machine allowed to stop, although the cylindrical part 88 of the clutch may remain in motion. The locking relation of the arm 92 with the plate 96 might be depended upon to completely arrest the mechanism but another disk 98 is pivoted beside said plate 96 and which is movable with the clutch part 89. A projection 89^a on this second disk is adapted to be engaged by a projection on the locking arm 92.

The device which closes the motor circuit is the same as that described in the aforesaid Letters Patent to Charles F. Kettering and will be briefly described here. To accomplish this function an additional plate 99 (Fig. 9) is mounted loosely on the shaft 56 and is connected to the disk 98 by a spring 100 which passes about the hub 1001. The spring 100 is connected at one end to a pin 101 on the disk 98 and extending through a slot 107 in the plate 99 and at its opposite end to a pin 1011 on the plate 99. As shown the plate 99 has a cut-away portion 102 in which is normally placed an anti-friction roller 103 on the lever 104 pivoted on the pin 105 which projects from the frame of the machine. The plate 99 has fastened thereto a lug 106, one end of which engages in the normal position of the parts with a third projection of the locking arm 92 thereby retaining the spring 100 under tension. When the machine is released the arm 92 moves from in front of the lug 106 and the spring 100 will then throw the plate 99 rapidly around until the pin 101 is reached by the other end of the slot 107 in which the pin moves. Clearly this movement of plate 99 will carry the cut-away portion 102 thereof away from the roller 103 on the lever 104 and thereby rapidly rotate the lever around the pivot pin 105. The arm 108 of the lever is adapted to engage the anti-friction roller 109 on the circuit closing arm 110 pivoted at 111 and carrying an insulating strip 112 directly over spring contact strips 113. When the plate is rotated the lever 104 rocks and the spring contact strips 113 are quickly depressed until they engage the stationary contacts 115 thereby closing the motor circuit. This contact is maintained during the complete operation of the machine and is broken at the end of the operation as the projection on the locking arm 92 moves downwardly again bringing one of its projections into the path of the lug 106 thereby stopping the plate 99. The cut-away portion102 of this plate is opposite the roller 103 and when the depressed portion of plate 98 reaches roller 103 the spring contact strips 113 rise, breaking the circuit, and the roller is again in the cut-away portion of disk 98 and plate 99.

It is clear from the preceding description that in the normal position of the parts disk 98 and plate 99 have a cut-away portion opposite the roller 103, but that when the plate 99 is released by a movement of the locking arm 92 the cut-away portion of the plate is thereby carried away from the roller and the circular portion of the plate moves opposite the roller. The circuit controlling lever 104 is held in closing position, until after one or more rotations of the clutch, determined in a manner to be hereinafter explained, inasmuch as the cut-away portions of the disk 98 and plate 99 are on different radial lines. At the end of the desired number of rotations of the clutch, the lock arm 92 is again moved to locking position and the plate 99 held stationary while plate 98 moves up until the original relative position of the two plates is restored and it is only when both depressed portions of the disk 98 and plate 99 are on the same radial lines that the spring contacts 113 may break the circuit.

The crank handle, which can be secured to the crank rod 116, is geared to the main

drive shaft 56 by the gear 117 on this crank rod meshing with the gear 118 fast to the rod 118ª projecting from the side frame of the machine (Figs. 1 and 3), and meshing in turn with the gear 119ª fast to the main drive shaft. The shaft 73 is driven by the main drive shaft as the gear 119 fast to the shaft 73 meshes with the large intermediate gear 118. As shown the gears 119ª and 119 are of the same size so that one rotation of the motor rotates each shaft once, but as the gear 119ª is twice the size of the gear 117 it is clear that two rotations of the gear 117 and therefore of the crank handle are required to give the requisite one rotation of the operating shaft 56.

This driving mechanism does not of itself quite bring the operating parts back to home position and the following described device is employed to accomplish such an end, (Fig. 3). The lever 120 is pivoted to the frame of the machine by the pin 121 and at each end carries an anti-friction roller. The roller on the upper end rides on the periphery of a cam 122 mounted on the shaft 56, while the roller on the lower end is in contact with the flat end 123ª of a spring pressed plunger 123 mounted on the lug 124ª. The cam 122 is so constructed as to gradually depress the spring of the plunger upon its rotation in the direction of the arrow until the very end of such rotation, when the upper roller will engage with a nearly radial edge 124 of the cam periphery and thereby permit the spring through the lever 120 to bring the operating parts completely home.

The invention is also provided with an accounting mechanism comprising totalizer elements 1500, and an actuating rack therefor. The actuating rack is differentially positioned by the operation of one of the keys. During the first cycle of movement of the operating parts the totalizer is rocked into engagement with this actuating rack and the actuating rack is then restored to normal position, whereby the value of the coin inserted into the machine is added on the totalizer. This actuating rack 125 is given one, two, or five units of movement depending upon the key depressed. To this end all of the keys at their lower end carry a projecting pin 126 which, when the keys are depressed, engage with the lower side of inclined slots 127 in plates 128 pivoted on pins 129 projecting from the frame 10. The plate 128 coöperating with the five cent key, is pivotally connected at 130 with the end of a link 131, the other end of this link being pivoted at 132 to an arm 133 fast to a stub shaft 134 loosely journaled in the frame 10. The plate 128 coöperating with the ten cent key is pivotally connected at 135 with a link 136, the other end of which pivotally connects also at 132 with the arm 133 rigid with the shaft 134. The plate 128 coöperating with the twenty-five cent key is rigid with an arm 137 pivoted at 138 to a link 139 connecting it at 140 with an arm (not shown) rigid with the actuator shaft 134. The parts just described are so constructed that the actuating rack 125 will be given its differential setting corresponding to the amount represented by the key depressed as the keys, when depressed, rock their plates 128 and move their connected links so as to impart differential setting to the actuator shaft 134.

After the rack is positioned by the depression of a key the lowest order totalizer pinion is then brought into mesh with the teeth of this actuating rack 125 by means of the operating mechanism. The totalizer elements are mounted in a frame 141 pivoted on a shaft 142 extending from the frame of the machine. The frame 141 has a downwardly projecting arm 143 pivoted at 144 at its lower end to one end of pitman 145, the other end of which is bifurcated and straddles the shaft 73 and has a roller 146 projecting into a cam groove 147 of a disk 148 rigid with the shaft 73. This cam groove is so shaped that the totalizer, through the pitman 145 and frame 141, is rocked into engagement with the rack at the beginning of the rotation of the disk 148 and remains in engagement until near the end of the first rotation of it. While the totalizer is in such position the actuating rack is restored to normal position and its differential setting is imparted to the totalizer elements. This is accomplished through a short pitman 149 (Fig. 2) which is pivoted to the plate 128 for the ten cent key at 150 and carries a roller 151, which is brought into engagement with the cam 152 (shown in dotted lines) carried by and rigid with the shaft 73. This cam is so constructed that after the totalizer has been rocked into engagement with the actuating racks the pitman 149 is given an upward movement, thereby, through the plate 128, link 136, and the arm 133, restoring the actuating rack to zero position. The totalizer is then rocked out of engagement with the rack by means of the cam 147 through the links 145 to the totalizer frame 141. This oscillatory movement is given to the totalizer upon each rotation of the shaft 73 and constitutes an idle movement after the first rotation, as the actuating rack, as just explained, is restored to zero position upon the first rotation of this shaft and the totalizer is at the end of each rotation disengaged from the actuating rack.

The totalizer is constructed similarly to that shown and described in Letters Patent of the United States No. 570,196, issued October 27th, 1896, upon an application filed by Fayette Barnard. The wheel of lowest order is actuated directly by the actuating rack 125, and is provided with alternating

ciphers and 5's and is arranged to transfer to the wheel of next higher order at each second unit of movement while the wheels of the higher order transfer after each complete rotation. Carrying operations from wheels of lower order to wheels of higher order are accomplished by the well known Geneva stop transfer mechanism, as indicated in Fig. 1.

Interposed between the shaft 1511 and the several registering wheels are suitable devices for causing the shaft when turned to pick up the wheels at different points at which they may be standing and carry them to their zero positions. This shaft 1511 at its left end carries a disk 1521 having in its periphery a single notch with which coöperates the pin 153 on the arm 154. The disks 155 are pivotally supported by side arms 156. When the shaft 1511 is turned the pin 153 rides on the periphery of the disk 152 and when the registering wheels are restored to zero position a pin 157 on the disk engages with an arm 158 thus preventing further movement of the disk. Finally, the arm 158 is rocked by its spring action to normal position as described in the aforesaid Barnard patent.

The device which determines the number of tickets to be issued will now be described. In general it comprises a locking member adapted to be given a differential movement dependent upon the coin inserted and the key operated, and operative means whereby the locking member is given a return movement of one step toward locking position as each ticket is issued. This locking member includes the arm 91, which is fast to the shaft 46, and has at its lower end a projection 159 which is normally in contact with the radial edge 160 of the cut-away portion of a disk 161 which is rotated in the direction shown by the arrow upon operation of the machine. To the same shaft 46 is rigidly secured the ratchet 47 which carries ratchet teeth 162 and also the stepped member 48 carrying stops 163 whose construction will be hereinafter described. When the motor is attached the locking arm 92 for the latter is also fastened to this shaft 46 so that when the locking arm 91 is given an extent of movement the locking lever 92 will be given the same extent of movement. A spring 164 is coiled about the shaft 46 and one end of this spring, which is under tension, is fast to the side frame of the machine, while the other end passes through an opening in the segment ratchet 47 and thereby tends to rock the ratchet 47 and the plate 48 in a counterclockwise direction. This movement, however, is normally prevented by pawls 165 and 166. The pawl 166 (Fig. 2) is normally in engagement with the foremost stop on the member 48 and is held in such normal position by springs 167 and 168 secured to one of the ends of a link 169 and at the other to a downwardly extending projection 170 of the pawl 166. At the upper end of this pawl 166 is a lug 171 having a rectangular face and engaging in a rectangular recess in the under side of the upper end of link 169 pivotally secured at 172 to an arm 173, which is fast to the shaft 134 on which the totalizer actuating rack 125 is rigidly mounted. When the totalizer actuating rack is differentially positioned, as has been explained, the link 169 is given a corresponding extent of movement downwardly which differential downward adjustment of the link causes the pawl 166 to be taken out of engagement with the foremost stop of the plate 48 and differentially positioned away from its normal position. The stops 163 on the plate 48 are so constructed that the distance between the arcs swept over by points of the adjacent stops is equal to one unit of movement of the pawl 166 about its pivotal center, so that when this pawl is differentially positioned the action of the spring 164 will rock the plate 48 to bring a stop 163 into engagement with the pawl 166 in its differentially set position, thus differentially setting the plate 48.

When this plate 48 has been differentially positioned it is necessary that the link 169 be taken out of engagement with the lug 171, as the totalizer rack is returned to its initial position at the end of the first cycle of movement of the operating mechanism, and this would not be permitted if the link remained in engagement with the lug 171 on the pawl 166 as this pawl can return to normal position only by a step by step movement as the member 48 is similarly moved out of the way. To disengage this link from the pawl an arm 174 loosely mounted on the shaft 40 and carrying a pin 175 at its outer end, is provided. A pitman 176 is also secured to this arm and at its lower end is forked over the shaft 56 and carries a roller 177, which rides on the edge of an open cam 178. After the plate 48 has been differentially positioned and at the very beginning of the operation of the machine the cam 178 gives the pitman 176 an upward movement thus moving the arm 174 with its pin 175 upwardly to disengage the link 169 from the lug 171 by the engagement of the pin 175 with the lower edge of the link.

The pawl 165 is loosely pivoted on the shaft 40 and is normally held in engagement with a ratchet tooth intermediate the ends of the ratchet plate 47 by the spring 179^a which is compressed between a pin 180 projecting from the arm 52 above described, and a lateral wall of the recess 181^a in the pawl. The other lateral wall of this recess 181 normally engages with the pin 180 so that when the bell crank, of which 52 is one arm, is rocked about its pivotal center upon opera-

tion of the key, as fully described, the pawl 165 is rocked out of engagement with the ratchet teeth and at the same time that the pawl 166 is rocked out of engagement with the plate 48. It can be seen that when the bell crank, loosely mounted on the shaft 40, is rocked back to normal position by the cam 178, as has been explained, that the pawl 165 will also be returned to normal position and thereby engage one of the teeth of the ratchet plate 47 in its differentially set position.

Means for restoring these differentially positioned members to their initial or normal position include a pitman 179 bifurcated at each end to straddle the shafts 40 and 56. It is given a reciprocating movement through a cam groove 1800 in which plays a roller 1800ª carried by the pitman. A pawl 182 is pivoted intermediate its ends at 183 to this pitman and at its lower end carries a roller 184, which, through a spring 185 mounted between the upper end of the pawl and a lug in the pitman, is caused to ride on the cam periphery of the disk 186 in which the groove 1800 is located. The cam disk 186 and the cam groove 1800 therein are so constructed that upon each rotation of the drive shaft 56 the pitman 179 is given an invariable extent of movement in the direction of its length and at the same time pawl 182 is rocked into engagement with one of the teeth on the ratchet plate 47 whereby this plate and the plate 48 is moved so that the pawl 166 engages the next stop toward the zero position. The teeth on the segment 47 and the stops on the member 48 are so constructed that the pawl 165 engages the alternate teeth of the ratchet plate 47 in moving the plate 48 one unit. When a coin has been inserted into the machine and the key depressed, the pawls 165 and 166 are taken out of engagement with the ratchet 47 and the stepped member 48 and these members are thereby differentially positioned under the action of the spring 164 by the engagement of that one of the steps 163 with the pawl 166 that the latter in being differentially set has been placed in the path of. Upon subsequent operation of the machine the link 169 is disengaged from the pawl 166 and the pawl 165 again brought into engagement with the ratchet 47 by the rocking of the arm 52 through the pitman 55. The pitman 179 is then given an upward movement in the direction of its length and at the same time the pawl 165 is rocked into engagement with the teeth on ratchet plate 47. This upward movement of the pitman 179, through the pawl 182, thus moves the ratchet plate 47, stepped member 48 and the locking arms 91 and 92 one step toward normal position upon each rotation of the cam disk 186.

The following mechanism is provided for printing and severing tickets to be issued by the machine. The paper on the roll 187 is fed by rolls 188 and 189, the former of which is provided with two flanges 190 (Fig. 6), which are of sufficient length to feed the paper the length of one ticket upon each operation of the machine and one rotation of this roll. The train of gears through which this roll is rotated is shown in Fig. 6. The gear 119 is journaled on the shaft 73 as in the gear 194 which meshes with an idle pinion 195, which is fast to the same shaft 196 as another similar idle pinion 197, which in turn meshes with the gear 198, the latter gear being integral with the roll 188. The gear 198 is in mesh with a corresponding gear 199 integral with the roll 189. The inking ribbon 200 may be fed by the spools 201 by any desired methed. The roll 188 is provided with a dater and consecutive numbering device, which are well known on the market, and not described in detail as these details are not essential to an understanding of the invention herein described. An inking roll 202 inks the type on this dater and consecutive numbering mechanism upon each rotation of the roll 188. A stationary type block and platen are shown in the drawings but it is to be understood that all of the printing might be easily done from the rolls 188 and 189 if suitably engraved. The platen carrying frame 203 is pivoted at one end to the frame of the machine by the pin 204, and at its forward end carries the platen 205, which is brought into contact with the stationary type block 206 at the beginning of each rotation of the roll 189 through the coöperation of the roller 207 which rides in a cam groove 208 in one of the faces of the roll 189. After the price of admission has been printed on the paper by the contact of the platen 205 against the type block 206 the paper is fed the length of one ticket and severed by a knife 210. This knife is carried on a frame 211 slidably mounted in a guide in a block 212 which is fast to the frame of the machine and provided with a suitable co-acting fixed knife edge 213. The frame 211 at its lower end is secured to a lever 214 which is loosely mounted on a stud 215 which projects from the frame of the machine. The rear end of this lever carries a roller 216 which also rides in a cam groove 208 so that after the ticket has been printed and fed a distance equal to its length it is severed by the knife 210.

Operation.

With the motor attached a complete operation of the machine is effected by a mere depression of one of the keys after the coin has been inserted in its corresponding slot, the coin and the particular key determining the extent of the differential movement of the differential mechanism, and consequently the number of tickets printed and issued at such operation. The insertion of the coin rocks

the arm 8 out of engagement with the lug 6 on the key and permits the depression of the key. Such depression locks the coin slots by moving the plate 24 through the movement of the detent 18, the lever 26, link 29, and the arms 30 and 32 and also releases the key locking plate 59 through the rocking of the arm 49 out of engagement with the arm 51, the rocking of the arm 49 being accomplished through the movement of the other detent 19. The depression of the key also differentially positions the actuating rack 125 as the rocking of the plates 128 by the keys is imparted to the rack through the link connecting the plate with one of the arms fast to the shaft 134 on which the rack 125 is mounted. The setting of the rack imparts a like setting to the pawl 166 through the link 169. After this pawl is so positioned the pawl 165 being taken out of engagement with the teeth of the ratchet 47 through the movement of detent 19, the members fast on the shaft 46 are rocked through the actuating spring 164 and thereby one of the stops on the stepped plate 48 is brought into engagement with the pawl 166. The locking arms 91 and 92 are thereby differentially positioned and when these parts have been differentially positioned the operating mechanism is actuated by the motor or by the crank handle if the motor is not attached. At the beginning of the operation of this mechanism the totalizer is rocked into engagement with its actuating rack 125 through the operation of the roller 146 on the pitman 145 in the cam groove 147 and the amount of the transaction is added on the totalizer by the restoration of the actuating rack to zero position through the cam 152. Before this rack is restored, however, the link 169 is taken out of engagement with the lug 171 on the pawl 166 through the movement of the pitman 176 by the engagement of the cam 178 with the roller 177 on the pitman.

The pitman 179 upon each rotation of the operating parts is given an upward movement and simultaneously the pawl 182 is rocked into engagement with the teeth on the ratchet 47 whereby the ratchet 47, stepped member 48, and the locking members 91 and 92 are moved one step toward initial position at each rotation of the drive shaft.

Upon each rotation of these parts the platen 205 is brought into engagement with the stationary type block 206 and subsequently during the same rotation the paper is fed the length of one ticket by the feed rolls 188 and 189 and severed by the knife 210 and 213. As the last ticket is being issued the locking members 91 and 92 are given their last unit of movement through the pawl 182 on the pitman 179 and the machine, when these locking members are returned home, is locked until another coin is inserted and one of the keys has been depressed.

While the form of mechanism herein shown and described is admirably adapted to fulfil the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein shown and described, as it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What is claimed is:—

1. In a machine of the class described, the combination with a ticket issuing mechanism adapted to issue one or more tickets at an operation of the machine; of an operating means therefor; a series of coin controlled manipulative devices for determining the number of tickets to be issued; and an accounting device with an actuating rack therefor positioned by said manipulative devices.

2. In a machine of the class described, the combination with a member to be differentially positioned; of coin controlled manipulative means for determining the differential movement of said member; a ticket issuing mechanism; and operating means therefor, adapted to cause the ticket issuing mechanism to issue a number of tickets corresponding to the differential position of said member.

3. In a machine of the class described, the combination with a ticket issuing mechanism adapted to issue one or more tickets at one operation of the machine; of an accounting device and an actuating element therefor; coin controlled manipulative means for determining the differential movement of said element; a spring actuated member determining the number of tickets to be issued; and connections intermediate said actuating element and said movable member whereby the differential movement of said element is imparted to said member.

4. In a machine of the class described, the combination with a ticket issuing device, adapted to issue a plurality of tickets; of operating means therefor adapted to be operated a number of times corresponding to the number of tickets to be issued; a spring actuated pivoted locking element for said means adapted to be differentially positioned and controlling the number of operations of the operating means; and a series of coin controlled manipulative devices for determining the extent of movement of said element and thereby the number of operations of said operating means and the ticket issuing device.

5. In a machine of the class described, the combination with means having a series of coin slots and a locking plate therefor; of

manipulative means for said plate; a ticket issuing device adapted to issue one or more tickets at an operation of the machine; operating means therefor; and connections intermediate said plate and said operating means serving to close said slots by the plate during the issuance of the number of tickets predetermined by the coin inserted and the manipulative means operated.

6. In a machine of the class described, the combination with a ticket issuing mechanism; of a motor therefor, constructed to be variably operated to cause the ticket issuing mechanism to issue one or more tickets at an operation of the machine; an accounting device; an actuating member therefor; and a series of coin controlled keys for determining the extent of operation of the motor and for differentially positioning said actuating member for the accounting device.

7. In a machine of the class described, the combination with means having a series of coin slots; of a closing member therefor; a series of keys; a locking element for the keys; means normally holding said closing member and locking element in inoperative position; and detents connected to said means whereby movement of said detents renders said closing member and locking element effective.

8. In a machine of the class described, the combination with means having a series of coin slots, and a slidable closing plate therefor; of a bank of keys; a detent for the keys; and connections between said detent and closing plate whereby operation of one of said keys moves said plate to close said slots.

9. In a machine of the class described, the combination with a series of coin receptacles; of a sliding closing plate therefor; a bank of keys; a detent adapted to be actuated by the keys; a locking member for said keys; a second detent also adapted to be actuated by the keys; connections intermediate the first detent and said closing plate, and intermediate the second detent and the locking member whereby operation of one of said keys moves said plate to close said receptacle and said member to lock said keys; and means for restoring one of said detents and the operated key to initial position before restoration of the other detent.

10. In a machine of the class described, the combination with a series of keys carrying projections; of means having a corresponding number of coin slots; a locking pawl for each key normally in engagement with the projection on the corresponding key; an arm for each coin slot rocked by coins inserted in its slot and connections from said arms to said pawls whereby the latter are taken out of engagement with said projections when their corresponding arms are rocked by insertion of a coin; and a projection on each of said pawls preventing completion of the depression of a key except when the arm moved by insertion of a coin is retained in moved position.

11. In a machine of the class described, the combination with a member to be differentially positioned; of coin controlled manipulative devices for determining the differential movement of said member; a ticket supply roll; mechanism for printing and severing tickets therefrom; and operating means for said mechanism adapted to cause the mechanism to print and sever a number of tickets corresponding to the differential position of said member.

12. In a machine of the class described, the combination with a ticket supply roll; of mechanism for printing and severing tickets therefrom; a motor therefor constructed to be variably operated to cause the mechanism to print and sever one or more tickets at an operation of the machine; an accounting device; an actuating member therefor; and a series of coin controlled keys for determining the extent of operation of the motor and for differentially positioning said actuating member for the accounting device.

13. In a machine of the class described, the combination with a ticket supply roll; of mechanism for printing and severing tickets therefrom; operating means adapted to cause said mechanism to print and sever one or more tickets at an operation of the machine; coin controlled manipulative means for determining the number of tickets to be issued; an accounting device; and an actuating rack therefor adapted to be differentially positioned by said manipulative devices.

14. In a machine of the class described, the combination with an accounting device; of an actuating member therefor; a series of coin receptacles; manipulative means controlled by coins inserted into said receptacles; and connections intermediate said actuating member and said manipulative means whereby operation of said manipulative means differentially positions said member.

15. In a machine of the class described, the combination with an accounting device; of an actuating rack therefor; a series of coin controlled keys; pivoted plates adjacent the keys and adapted to be moved by said keys; connections intermediate said rack and said plates whereby operation of a key differentially positions said rack; and operating means for restoring said rack to normal position.

16. In a machine of the class described, the combination with an accounting device; of an actuating member therefor; a series of manipulative devices for differentially positioning said actuating member; means nor-

mally preventing operation of said manipulative device; and receptacles for the insertion of coins to render said means ineffective to prevent operation of the desired key.

17. In a machine of the class desdribed, the combination with an accounting device; of an actuating rack therefor; coin controlled manipulative means for differentially positioning said actuating rack; and operating means for actuating said accounting device and said rack whereby the differential movement of the rack is imparted to the accounting device.

18. In a machine of the class described the combination with a ticket vending machine, controlled by coins of different denominations, the coins being insertible into separate coin slots, of a plate for opening and closing all of the coin slots at each operation of the machine, and means for locking said plate in closed position during the operation of the machine.

19. In a machine of the class described the combination with a ticket vending machine, of coin controlled keys for controlling the same, a member having coin slots, one for each key, and means operated by all of said keys for closing said slots.

20. In a machine of the class described the combination with a ticket vending machine, of coin controlled keys controlling the same, operating mechanism, a member having coin slots one for each key, a plate operated by all of said keys for closing said slots, and means for automatically locking said plate in closing position during the operation of the machine.

21. In a machine of the class described the combination with a ticket vending machine, of manipulative means for controlling in conjunction with coins of different values, said machine, the coins being insertible into separate coin slots, and means operated by said manipulative means for closing all of said slots upon each operation of said manipulative means.

22. In a machine of the class described the combination with a ticket vending machine, of operating mechanism therefor, manipulative means for controlling, in conjunction with coins of different denominations, said machine, the coins being insertible into separate coin slots, means operated by said manipulative means for closing all of said slots, and means for locking said closing means in closing position during the operation of the machine.

23. In a machine of the class described the combination with a ticket issuing mechanism, adapted to issue a varying number of tickets upon different operations of the machine, of a differentially movable member for controlling the number of tickets to be issued at an operation of the machine, and differentially movable means coöperating with said member to control the extent of movement of the latter, the movement of said means being determined by coins inserted into the machine.

24. In a machine of the class described the combination with a ticket issuing mechanism, adapted to issue a varying number of tickets of a differentially movable device for locking the same, the extent of movement of said device being determined by coins inserted into the machine.

25. In a machine of the class described the combination with a ticket issuing mechanism adapted to issue a varying number of tickets during different operations of the machine, of a differentially movable member for controlling the number of tickets to be issued and having a normal position the extent of movement of the member being determined by coins inserted into the machine, and operating means for restoring said differentially movable member to normal position at each operation of the machine by a step by step movement.

26. In a machine of the class described the combination with a ticket issuing mechanism, adapted to issue a varying number of tickets during different operations of the machine, of a differentially movable member for controlling the number of tickets to be issued, and having a normal position, coin controlled keys for controlling movement of said member from normal position, and operating means for restoring said differentially movable member to normal position at each operation of the machine by a step by step movement.

27. In a machine of the class described the combination with a ticket issuing mechanism adapted to have a variable operation for issuing a variable number of tickets upon different operations of the machine, of a differentially movable member for controlling the variable operation of the machine, and having a normal position, the extent of movement of said member being determined by coins inserted into the machine, a pawl coöperating with said member, and cam means for operating said pawl to restore said member to normal position.

28. In a machine of the class described the combination with a ticket issuing mechanism, adapted to issue a varying number of tickets upon different operations of the machine, of a differentially movable device for controlling the number of tickets to be issued during an operation of the machine and having a normal position the extent of movement of said device being determined by coins inserted into the machine, a pawl coöperating with said member, and cam means for operating said pawl to restore said member to normal position.

29. In a machine of the class described the combination with a ticket issuing mecha-

nism, adapted to issue a varying number of tickets upon different operations of the machine, of a differentially movable device for controlling the number of tickets to be issued during an operation of the machine and having a normal position, coin controlled manipulative means for controlling the movement of said device, a pawl coöperating with said member, and cam means for operating said pawl to restore said member to normal position.

30. In a machine of the class described the combination with a ticket issuing mechanism, adapted to issue one or more tickets at an operation of the machine, of a differentially movable device for determining the number of tickets to be issued at an operation of the machine, an adjustable member controlling said device, a plurality of keys, means normally locking said keys against operation and adapted to be rendered ineffective by coins inserted into the machine, and means having differently inclined slots with which the keys coöperate to adjust said member differentially.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANCESCO SKERL.

Witnesses:
J. BYRON RICKETTS,
CARL BEUST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."