

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 1

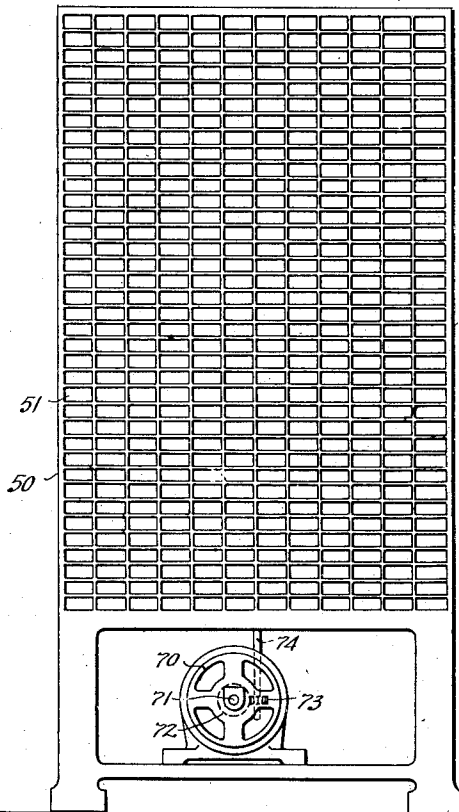


Fig. 1.

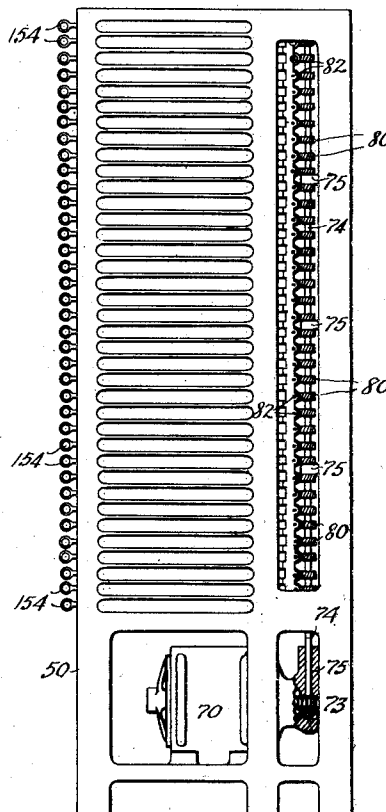


Fig. 2.

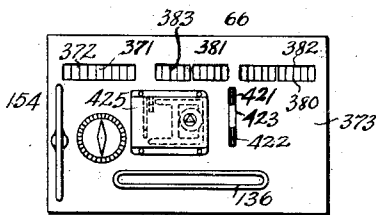


Fig. 3.

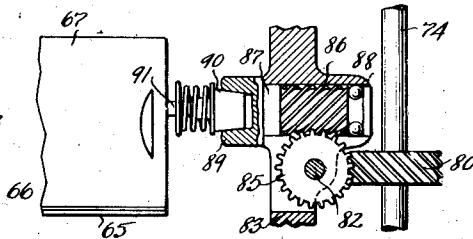


Fig. 4.

WITNESSES

A. J. Mank
W. J. H. H. H. H.

INVENTORS

FRED A. PURDY
H. L. L. PURDY
EUGENE LETSCH

BY

Mumford
ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 2

ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 3

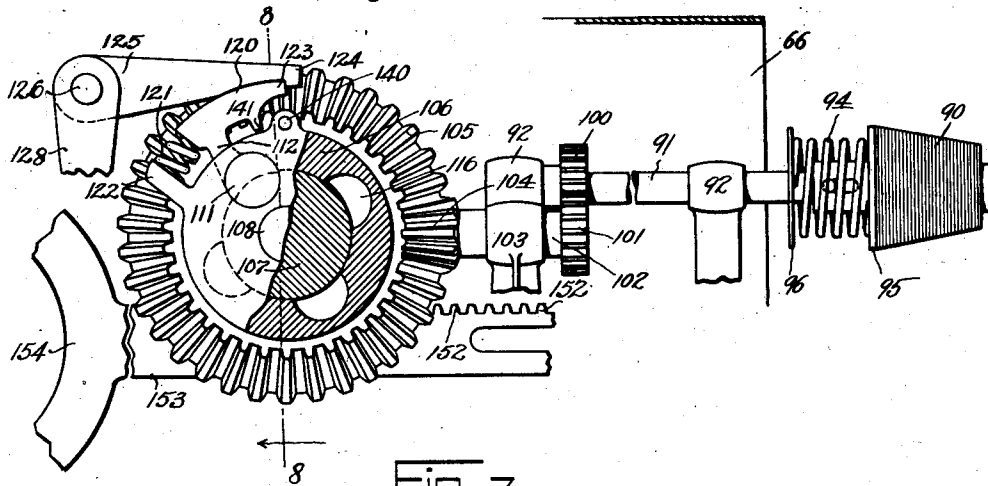


Fig. 7.

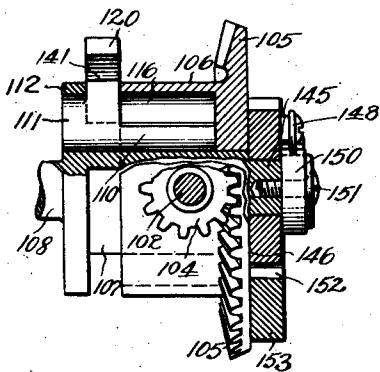


Fig. 8.

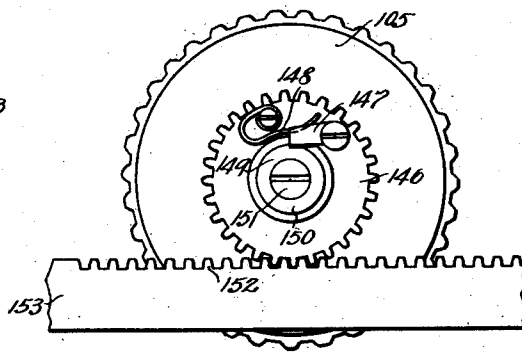


Fig. 9.

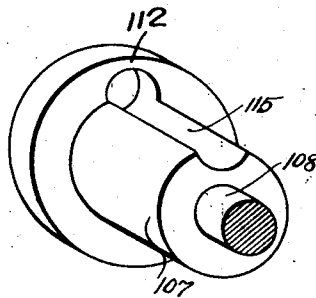


Fig. 10.

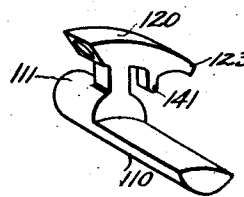


Fig. 11.

WITNESSES

A. J. Mank
W. H. Hester

INVENTORS
FRED A. PURDY
H. M. L. PURDY
EUGENE LETSCH
BY *Mum & Co*
ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 4

Fig. 12.

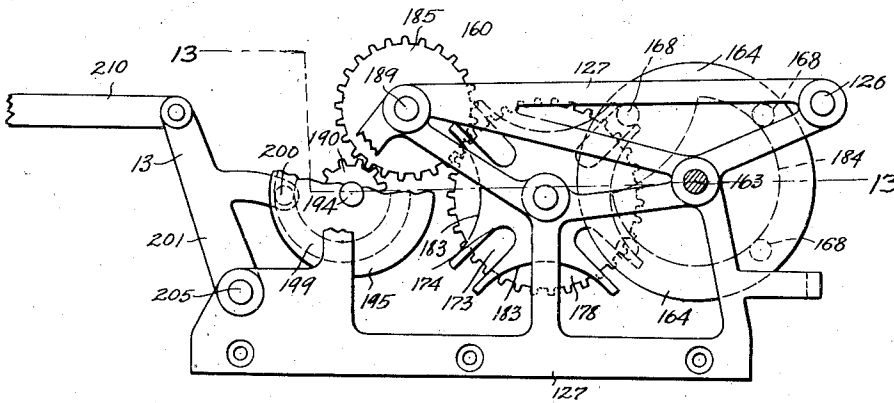


Fig. 12A.

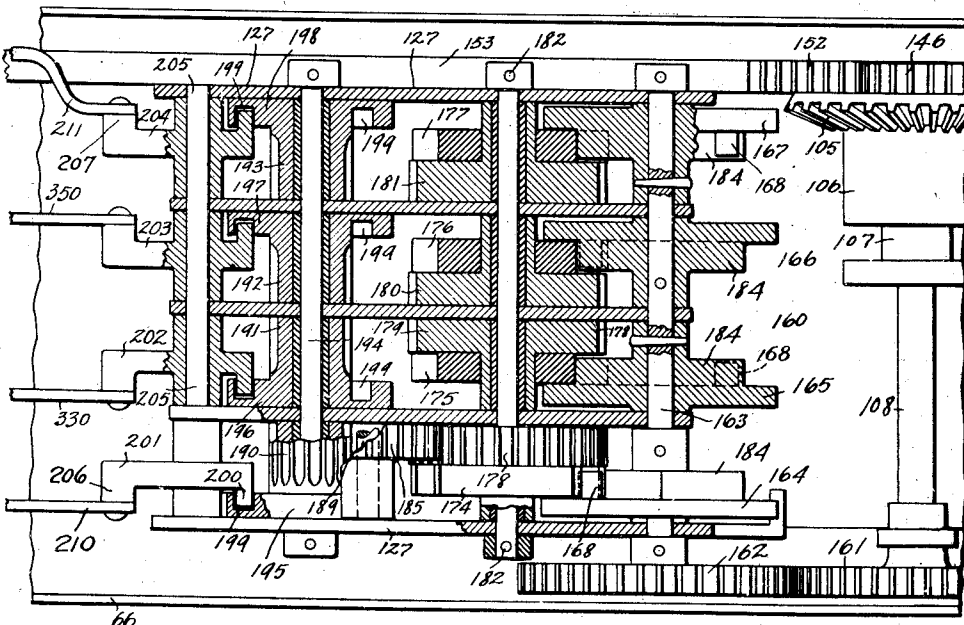
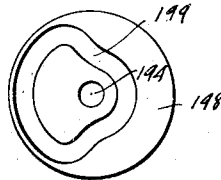


Fig. 13.

WITNESSES

A. J. Mank
R. J. Hostetler

INVENTOR
FRED A. PURDY
H. M. L. PURDY
EUGENE LETSCH
BY
Mumford
ATTORNEYS

June 16, 1936.

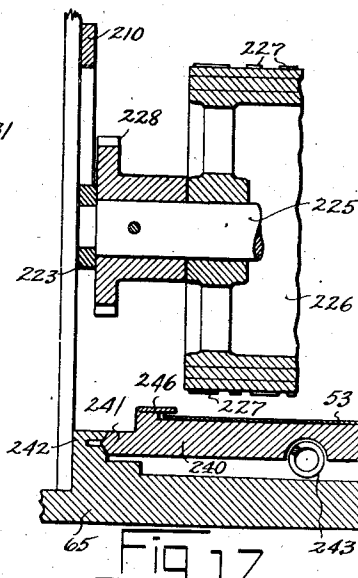
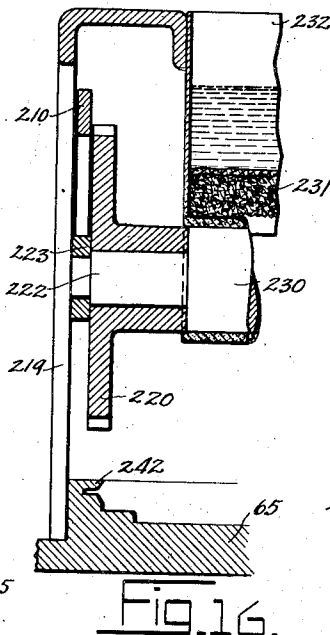
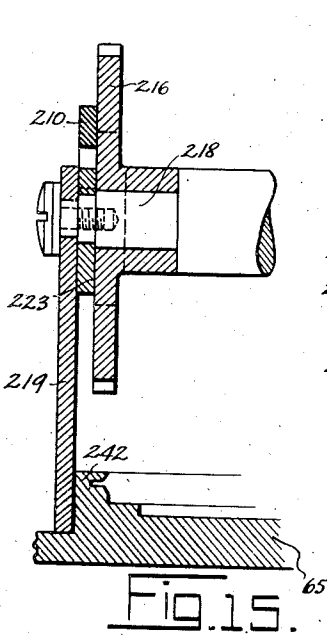
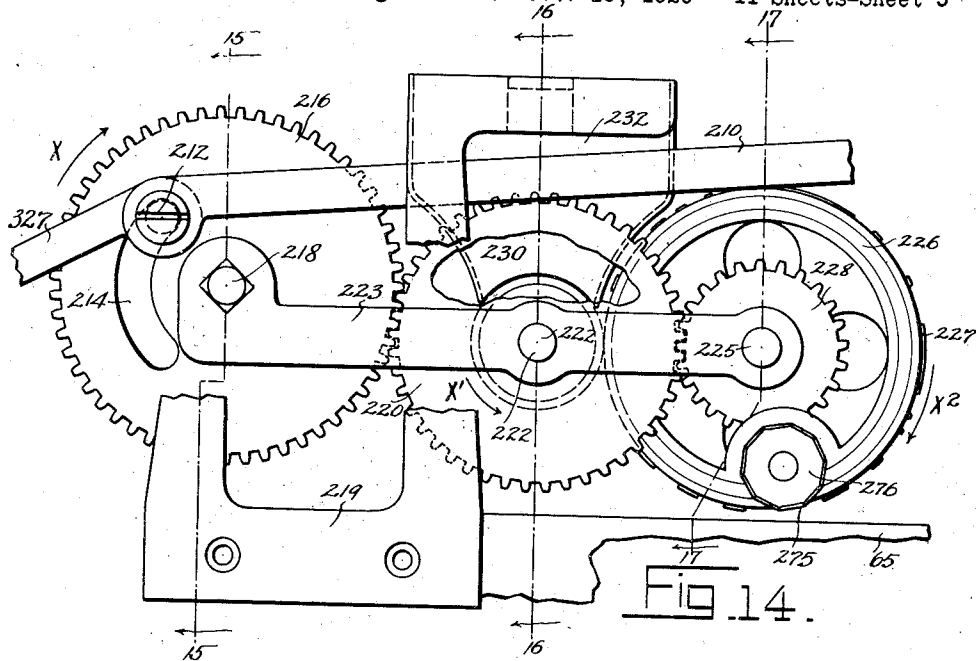
F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920

11 Sheets-Sheet 5



WITNESSES

A. J. Mank
W. J. Hosh

INVENTORS

FRED A. PURDY
H. M. L. PURDY
EUGENE LETSCH
BY *Mumde*
ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 6

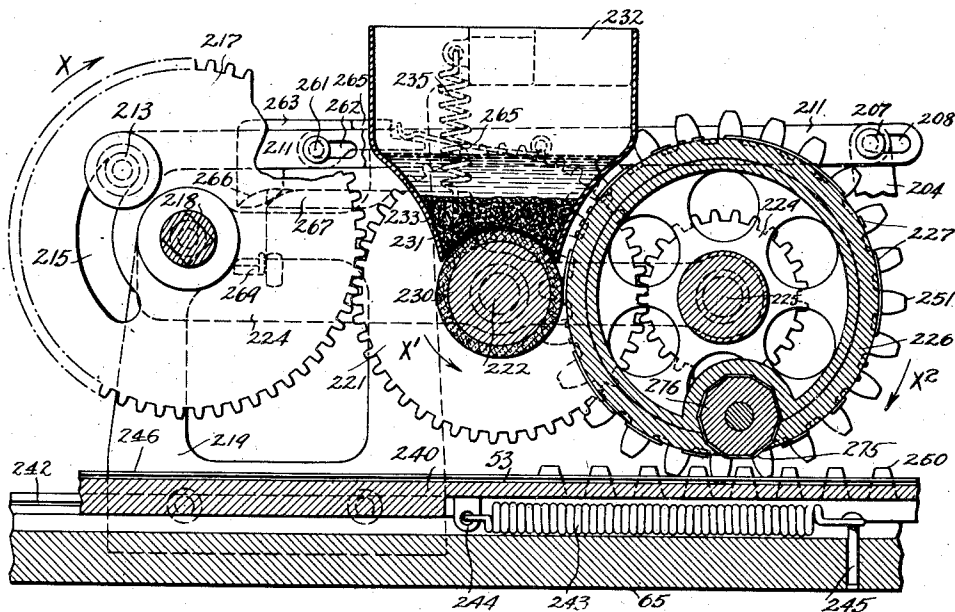


Fig. 18.

Fig. 19.

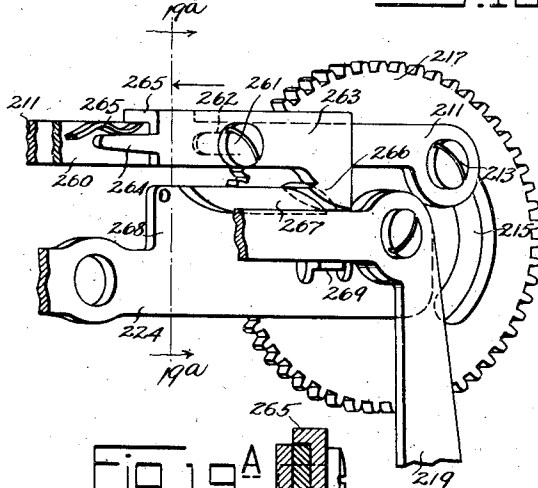


Fig. 19A.

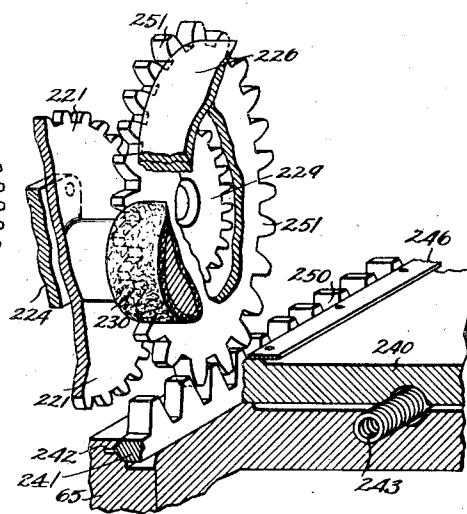


Fig. 20.

WITNESSES
A. J. Mark
W. J. H. H. H.

INVENTORS
FRED A. PURDY
H. M. L. PURDY
EUGENE LEISCH
 BY *Mumde*
 ATTORNEYS

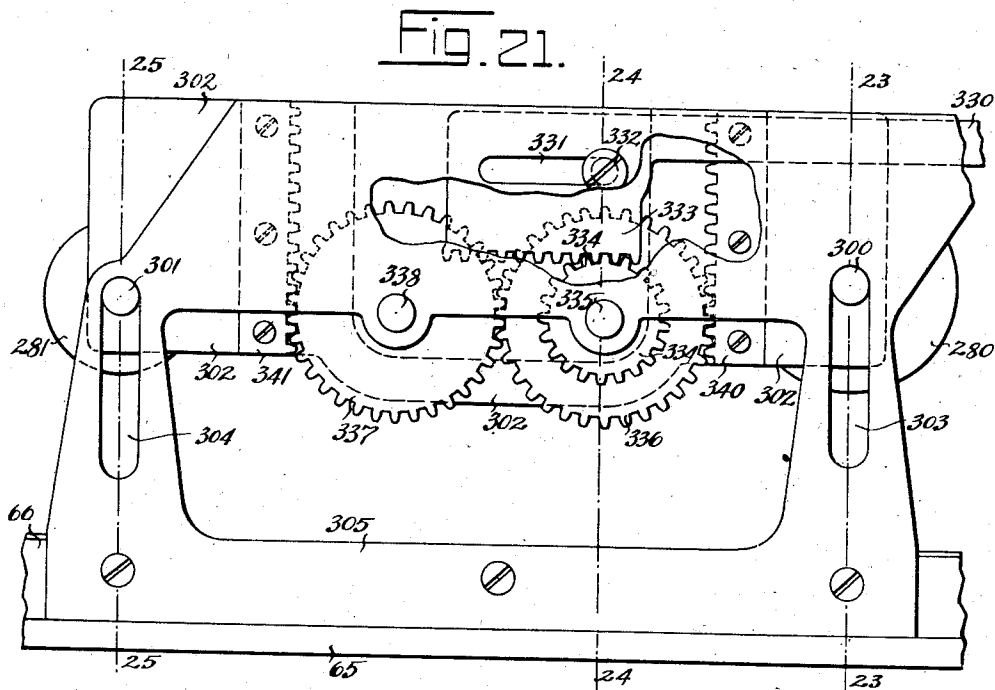
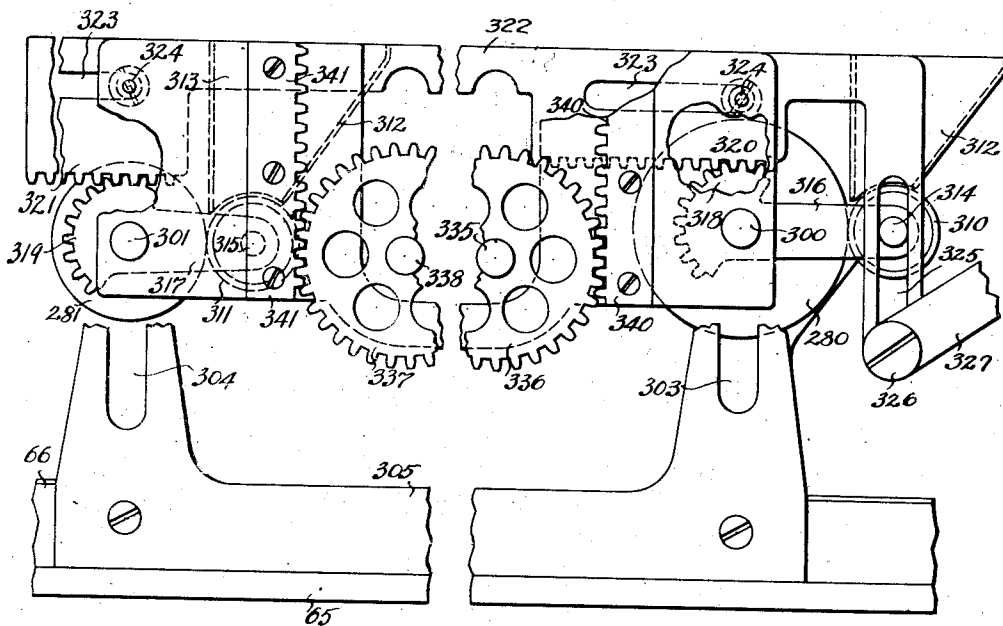
June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 7.



WITNESSES

C. J. Mank

Rev. J. Hooper

INVENTORS

INVENTORS
FRED A. PURDY
HERBERT M. L. PURDY
BY EUGENE LETSCH

HERBERT M. L. PURDY

EUGENE LETSCH

BY

MumCo
ATTORNEYS

ATTORNEYS

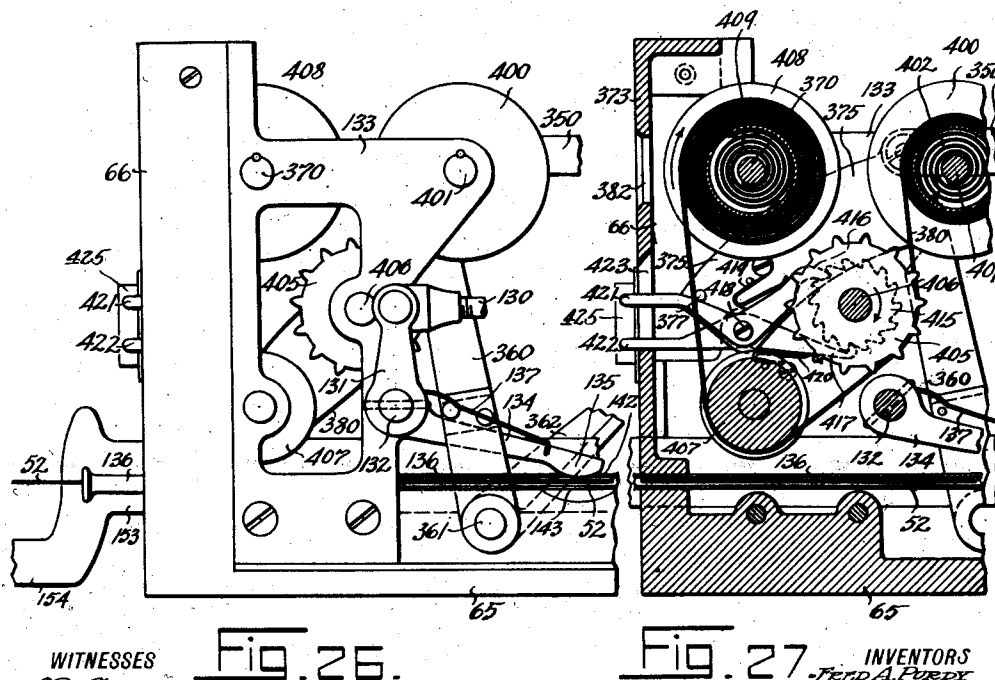
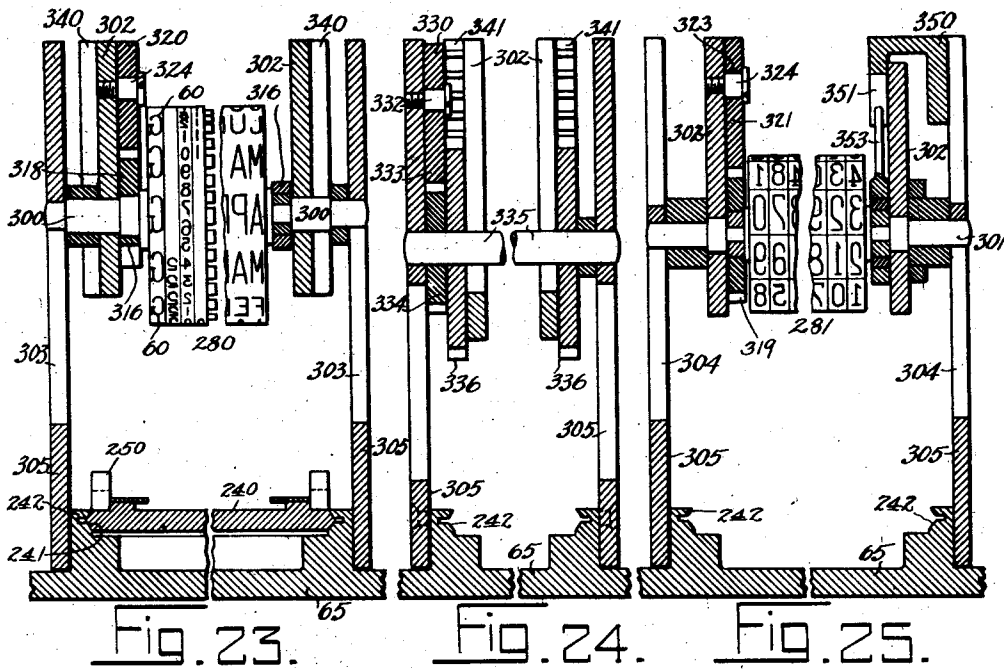
June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 8



WITNESSES
A. J. Mank
R. J. Hovatt

Fig. 26.

Fig. 27
 INVENTORS
 FEED A. PURDY
 HERBERT F. PURDY
 EUGENE LETSCH
 BY *Mumford*
 ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 9

380

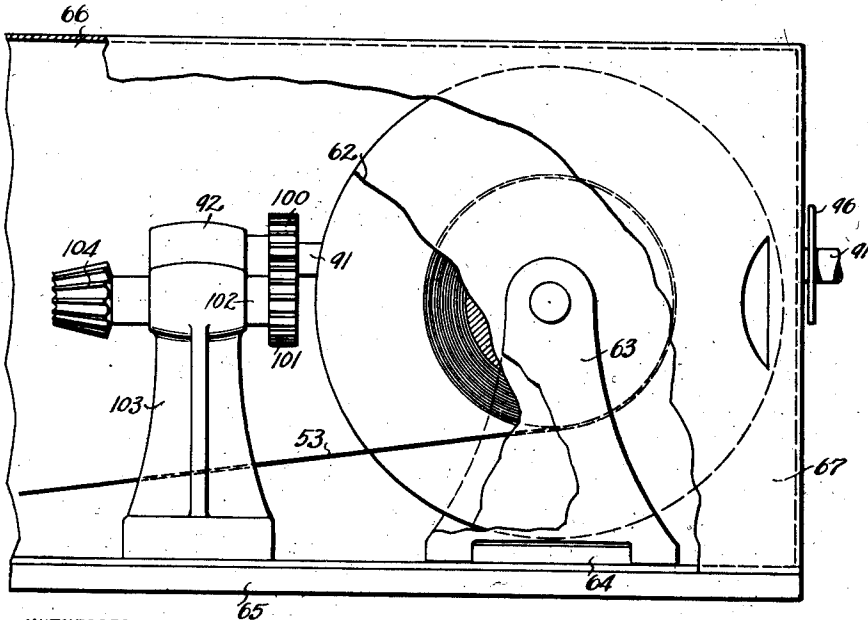
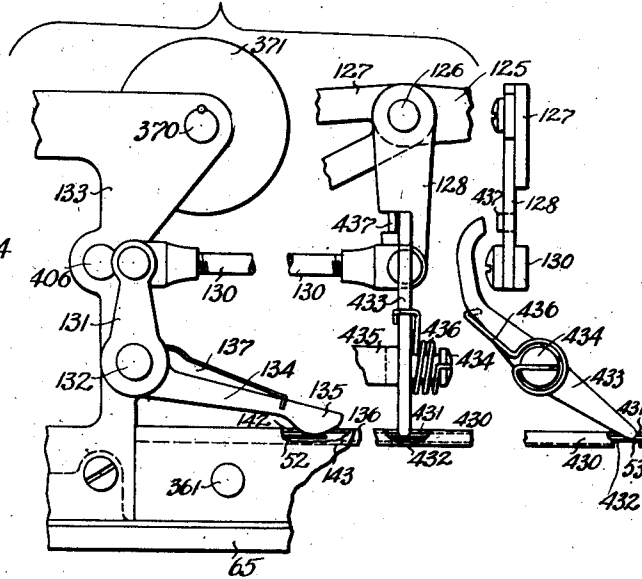
22050	00245
22140	00246
22230	00247
22320	00248
22410	00249
22500	00250
22590	00251
22680	00252
22770	00253
22860	00254
22950	00255
23040	00256
	00257

385

Fig. 30.

Fig. 28.

Fig. 29.



WITNESSES

A. J. Mank
W. J. Hoster

Fig. 31.

INVENTORS
FRED A. PURDY
H. M. L. PURDY
EUGENE LETSCH
BY *Mumford*
ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 10

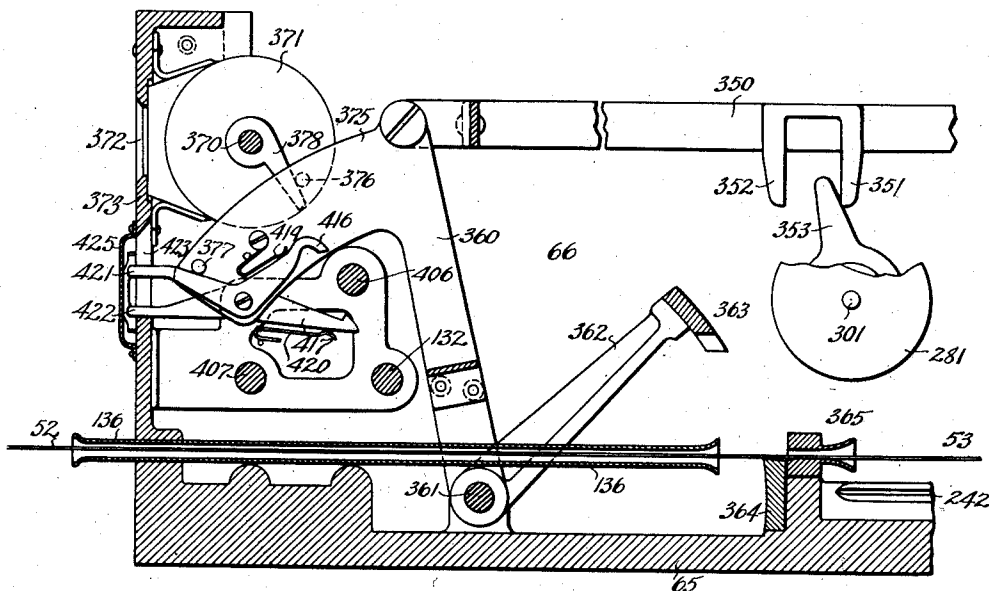


Fig. 32.

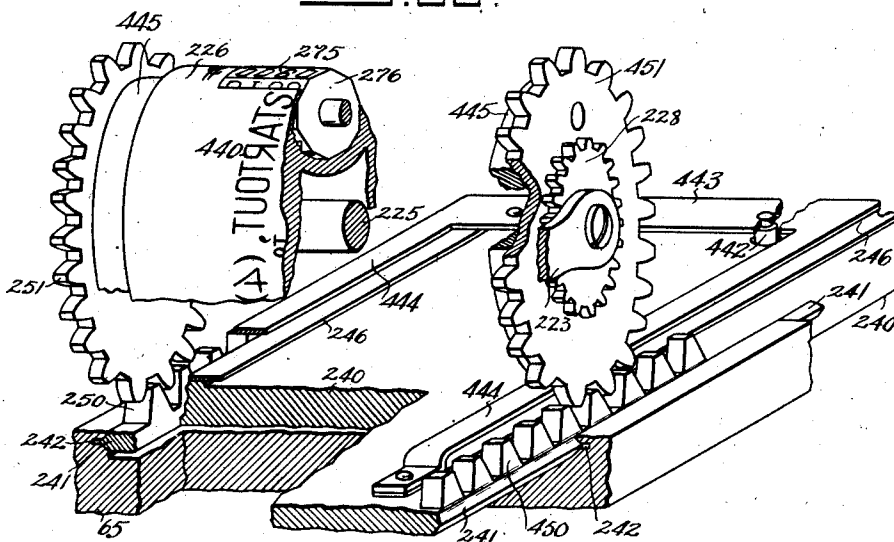


Fig. 33.

WITNESSES

A. J. Mank
Wm. H. Hester

INVENTORS

FRED A. PURDY
H. M. L. PURDY
EUGENE LETSCHER

BY

Mumford
ATTORNEYS

June 16, 1936.

F. A. PURDY ET AL

2,044,367

TICKET PRINTING, ISSUING, AND ACCOUNTING MACHINE

Original Filed Oct. 15, 1920 11 Sheets-Sheet 11

Fig. 34.

61 06 54 13	NATIONAL RAILWAY COMPANY Via Direct Line One First Class Passage STARTOUT, (4) - N.Y. 58 -TO- WESTCHESTER-N.Y. 57 F.A.C. Simile P.T.M.	NOV. 20, 1919 59 57	52	56	53
NOT TRANSFERABLE					

Fig. 35.

54 441 06 54 13	NATIONAL RAILWAY COMPANY Via Direct Line One First Class Passage STARTOUT, (4) - N.Y. 58 -TO- WESTCHESTER-N.Y. 57 F.A.C. Simile P.T.M.	NOV. 20, 1919 59 57	52	56	53
NOT TRANSFERABLE					

WITNESSES

A. J. Frank

Wm. J. Herndon

INVENTORS

FRED A. PURDY
HERBERT M. L. PURDY
EUGENE LEITCH

BY

Mumford

ATTORNEYS

UNITED STATES PATENT OFFICE

2,044,367

TICKET PRINTING, ISSUING, AND
ACCOUNTING MACHINE

Fred A. Purdy, Scarsdale, and Herbert McLean
Purdy, New York, N. Y., and Eugene Letsch,
Union City, N. J., assignors to General Register
Corporation, Philadelphia, Pa., a corporation
of Pennsylvania

Refiled for abandoned application Serial No.
417,181, October 15, 1920. This application
April 18, 1931, Serial No. 531,039½

53 Claims. (Cl. 101—66)

This application was originally filed October 15, 1920 under Serial No. 417,181.

The object of the invention is to provide a new and improved ticket printing, issuing, and accounting machine, more especially designed for use by ticket agents issuing tickets for various purposes, more particularly, however, for the use of railroads, steamships, ferries, and other transportation concerns.

One of the objects of the invention is to provide a machine which will print and issue tickets in complete form ready for handing to passengers on demand without any operations or adjustments being first performed by hand or by machine after passenger has called for ticket; and thus to save time of both the ticket selling clerk and the passenger, and thereby permitting the handling of a large number of passengers in a given time.

Another object is to provide a ticket machine which automatically prints and issues tickets ready for delivery to passengers, the act of delivery of one ticket causing the printing of another ticket automatically and the moving of said second ticket into position ready for delivery to another passenger.

Another object of the invention is to account for the tickets issued, as to the number of tickets sold and the total amount of money collected, providing for each destination or kind of ticket such an account for tickets issued within the daily working time or shift of any ticket selling clerk, in addition to such an account cumulative over the ticket office general accounting period, eliminating the necessity of progressive book records and arithmetical calculations mentally and otherwise.

Another object is to provide accounting means which shows the number of tickets issued and amounts of money to be accounted for in two divisions, one for the ticket selling clerk's daily working time or shift, and the other for the ticket office general accounting period, or to provide accounting means which carries such accounts for each destination or kind of ticket separately and distinctly from those of any and all other destinations and kinds of tickets.

Another object of the invention is to eliminate the expense, labor, time, and responsibility heretofore involved in having tickets of varying destinations and kinds in large variety printed and numbered in advance, whereby they have been made of value for audit purposes, necessitating protection under lock and key, and counting through and recording in stock-books on receipt from printer, in distributing to clerks, in auditing,

etc., an effort to prevent sales out of consecutive order with failure to account for money collected until order was reached.

Another object of the invention is to obtain immunity from total disablement of the machine resulting from failure of any single mechanism, by providing independence of the mechanism for printing, issuing, and accounting for any one destination or kind of ticket from the mechanism for printing, issuing, and accounting for any and all other destinations and kinds of tickets; and, further, in case of failure of the common driving power, to provide means for hand operation of each independent mechanism.

Another object of the invention is to provide a machine of a design to which additions to meet growing requirements as to destinations or kinds of tickets to be issued may be made without relative changes of the machine parts throughout.

Another object of the invention is to provide a machine which occupies a small amount of office space in relation to the number of destinations or kinds of tickets provided for, and the size of tickets issued.

The machine is more particularly designed for producing tickets generally known as "local", that is, tickets which consist of one coupon only for one-way trips over lines of an issuing railroad, for instance; or of two coupons for return trips over the lines of the issuing railroad. The same principle as is applied in providing tickets of two coupons for return trips may be applied for providing tickets of two coupons for a single trip in the one general direction where more than one coupon is needed on account of more than one railroad carrying the passenger upon such trip, or may be applied for providing tickets of three, four, or more coupons, one way or return.

The invention as a whole is adaptable to use in issuing tickets for other than railroad uses, as for admission to theatres and other places of amusement, baggage checking, parcel storage, hat-checks, tickets to be folded into register for punching, trading stamps, cash coupons, etc., and is thus capable of use as a whole or in any part in other embodiments without constituting departure from the present invention.

With these and other objects in view, the invention consists of certain novel features of construction, as hereinafter shown and described and then specifically pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar char-

acters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the improved ticket printing, issuing, and accounting machine;

5 Figure 2 is a side elevation of the same with part shown in section;

Figure 3 is an enlarged front elevation of one of the ticket printing, issuing and accounting units;

10 Figure 4 is a side elevation of the rear portion of the same with parts shown in section;

Figure 5 is a side elevation of a ticket printing, issuing, and accounting unit with one side of the casing broken out;

15 Figures 6 and 6a show an enlarged plan view of the unit with the driving shaft for the several units shown in section;

Figure 7 is an enlarged side elevation of the power transmission mechanism for a unit with part shown in section;

20 Figure 8 is a cross section of the same on the line 8—8 of Figure 7;

Figure 9 is a rear side elevation of the same showing more particularly the hand power mechanism for actuating a unit by hand;

25 Figure 10 is a perspective view of the clutch body of the power transmission mechanism;

Figure 11 is a similar view of the locking clutch member;

30 Figure 12 is an enlarged side elevation of the Geneva movement for intermittently driving the actuating cam and lever mechanisms;

Figure 12a is a face view of one of the cams;

35 Figure 13 is a sectional plan view of the same on the line 13—13 of Figure 12;

Figure 14 is an enlarged side elevation of the main printing cylinder and the inking mechanism therefor, part being shown broken out;

40 Figure 15 is a cross section of the same on the line 15—15 of Figure 14;

Figure 16 is a similar view of the same on the line 16—16 of Figure 14;

Figure 17 is a similar view of the same on the line 17—17 of Figure 14;

45 Figure 18 is an enlarged sectional elevation of the main printing cylinder, the inking means therefor, and the platen, parts being shown broken out;

Figure 19 is a rear perspective view of the mechanism for imparting a downward movement of the printing cylinder;

Figure 19a is a cross section of the same on the line 19a—19a of Figure 19;

50 Figure 20 is a sectional perspective view of the platen portions of the main printing cylinder, the inking roller, and the gearing for the same, and the platen;

Figure 21 is an enlarged side elevation with parts broken out of the date printing mechanism, the identification printing mechanism, and the consecutive number printing mechanism;

Figure 22 is a similar view of the same with parts broken out;

55 Figure 23 is a cross section of the same on the line 23—23 of Fig. 22;

Figure 24 is a similar view of the same on the line 24—24 of Fig. 22;

Figure 25 is a similar view of the same on the line 25—25 of Fig. 22;

70 Figure 26 is an enlarged side elevation of the front or delivery end of a ticket printing, issuing, and accounting unit, part of the ticket delivery tube being shown in section;

Figure 27 is a sectional side elevation of the same;

Figure 28 is an enlarged side elevation of the controlling device for power transmission clutch;

Figure 29 is an edge view of the automatic locking device for the controlling mechanism to lock the latter in case the ticket paper runs out 5 in the corresponding unit;

Figure 30 is a face view of the tape showing the number of tickets sold and the total amounts of the fares;

Figure 31 is an enlarged side elevation of the rear end of a unit and showing more particularly the ticket paper roll and driving mechanism for the unit, parts being shown broken out;

Figure 32 is an enlarged sectional side elevation of the front of the delivery end of the ticket printing, issuing, and accounting unit, and showing more particularly the ticket cutting-off mechanism;

Figure 33 is a sectional perspective view of a modified form of the main printing cylinder and the platen for the same;

Figure 34 is a face view of a portion of the ticket paper showing the successive steps in printing the ticket; and

Figure 35 is a similar view of a modified form 25 of the same.

General construction

The ticket printing, issuing, and accounting machine is mounted on a suitably constructed casing 50 provided with tiers of cells 51 open at the front and each containing a removable ticket producing unit, each unit being adapted to produce a complete ticket 52 from a blank strip of ticket paper 53 (see Figure 34), or a complete ticket 54 from a partly printed strip of ticket paper 55 (see Figure 35); as hereinafter more fully explained. Each unit produces tickets for one distant station, and the several units of the machine embrace the different stations along one or more routes. Thus each ticket 52 or 54 40 has printed thereon the usual ticket body matter 56 including the issuing station and the station of the destination 57, the fare 58, the issuing date 59, an identification character 60 of the issuing station, and a ticket number 61. The ticket shown in Figure 34 is printed wholly on a blank strip of paper. The ticket 54 has its body 56 printed on the strip of paper by another machine while the issuing station, the destination, 50 the price, date, identification character, and the ticket number are supplied by the unit. The strip of ticket paper 53 (or 55) unwinds from a roll or spool 62 (Figures 5 and 31) journaled in a bracket 63 removably held on a retaining lug 64 attached to the rear portion of the base 65 55 of a main framework of a unit, and which framework slidably fits into a corresponding cell 51. The framework 66 is provided at one side of its rear portion with a sliding door 67 (Figures 4 and 31) to permit of conveniently removing a bracket 63 carrying an empty spool 62 and replacing it by another with a roll of blank ticket paper. The strip of ticket paper 53 (or 55) extends from the roll 62 forward in the lower portion of the framework 66. 65

Power driving mechanism

In the base portion of the casing 50 is mounted a suitable motor 70, preferably of the electrical 70 type, and having the rear end of its shaft 71 (see Figures 1 and 2) connected by a gear wheel 72 with a gear wheel 73 secured on the lower portion of a vertical shaft 74 journaled in suitable bearings 75 attached to or forming part of the 75

rear of the casing 50. On the shaft 74 are secured gear wheels 80, one at each tier 51, and each gear wheel 80 is in mesh with a gear wheel 85 secured on a transversely extending shaft 82 journaled in suitable bearings arranged on a support 83 attached to or forming part of the rear of the casing 50. Thus a transverse shaft 82 is provided for driving the several units held in a tier 51 of the casing 50. For the purpose mentioned each shaft 82 is provided with gear wheels 85, one for each unit, and each in mesh with a gear wheel 86 formed or secured on a shaft 87 journaled in a bearing 88 arranged on the support 83 (see Figure 4). Each shaft is provided at its forward end with a clutch member 89 adapted to be engaged by a clutch member 90 mounted to turn with and to slide on the rear end of a shaft 91 journaled in suitable bearings 92 (see Figure 6a) secured to the main framework 66 of the corresponding unit. One end of a spring 94 presses the clutch member 90 rearwardly into firm engagement with the clutch member 89, and the other end of the said spring 94 abuts against a collar 96 secured on the shaft 91. On the shaft 91 is secured a gear wheel 100 in mesh with a gear wheel 101 secured on a shaft 102 journaled in a bearing 103 attached to the main framework 66 of the unit. On the shaft 102 is secured a bevel pinion 104 in mesh with a bevel gear wheel 105 having its hub 106 (see Figures 7 and 8) mounted to rotate loosely on an enlarged portion 107 forming part of a shaft 108 (see Figure 6a) journaled in suitable bearings 109 arranged on the unit framework 66. The hub 106 of the gear wheel 105 is adapted to be connected with the enlarged portion 107 of the shaft 108 by the use of a clutch or coupling member 110 of half round shape and provided at one end with a trunnion 112 (see Figure 11) journaled in a flange 111 forming part of the enlargement 107 of the shaft 108. The half round clutch or coupling member 110 extends into a correspondingly shaped recess 115 formed in the enlarged portion 107 of the shaft 108 and is adapted to be rocked to move in a recess 116 formed in the hub 106 to lock the latter to the enlarged portion 107 with a view to rotate the shaft 108 from the gear wheel 105. Normally the clutch member 110 has its flat portion out of engagement with the recess 116 and hence the gear wheel 105 rotates loosely on the enlarged portion 107 of the shaft 108, and the latter remains at a standstill. When, however, the clutch member 110 is rocked and extends partly into one of the recesses 116 then the shaft 108 is driven from the gear wheel 105.

Clutch controlling devices

In order to rock the clutch member 110 the following arrangement is made: The trunnion 112 of the clutch or coupling member 110 is provided with an arm 120 pressed on by a spring 121 (see Figures 7 and 8) resting on a lug 122 forming part of the hub 106. The free end 123 of the arm 120 normally abuts against a lug 124 formed on a rocker arm 125 secured on a transverse shaft 126 journaled on an auxiliary framework 127 forming part of the main framework 66 of the unit. On the shaft 126 is secured an arm 128 connected by a link 130 (see Figures 5, 26, 27, 28, and 29) with an arm 131 secured on a transverse shaft 132 journaled in an auxiliary framework 133 attached to or forming part of the unit framework 66. On the shaft 132 is secured a feeler arm 134 provided with a rounded

off portion 135 resting on the rear portion of the produced ticket 52 held at the time in a guide or delivery tube 136 attached to the unit framework 66 and projecting at the front thereof, with the forward end of the ticket 52 projecting a short distance beyond the forward end of the guide or delivery tube 136. A spring 137 presses the arm 134 downward to hold the rounded-off end 135 in contact with the ticket 52 and to cause the arm 134 to swing downward when the ticket 10 is drawn out from under the end 135. It will be noticed that when the ticket 52 is pulled out of the guide and delivery tube 136 the rounded off portion 135 of the feeler arm 134 loses its support and hence the arm 134 swings downward 15 and in doing so rocks the shaft 132 thereby moving the arm 131 rearwardly and likewise the link 130 and the arm 128 to rock the shaft 126. This movement given to the shaft 126 causes an upward swinging of the arm 125 whereby the lug 20 124 (Figure 7) moves out of engagement with the free end 123 of the arm 120 whereby the latter is swung to the right by the action of its spring 121 thus turning the clutch or coupling member 110 into engagement with the next registering 25 recess 116 to couple the hub 106 of the gear wheel 105 with the enlarged portion 107 of the shaft 108 to rotate the latter from the gear wheel 105. The forward movement of the arm 120 is limited by a stop pin 140 held on the hub 106 and adapted to be engaged by a lug 141 on the arm 120 (see Figure 7). It is understood that when the next following ticket is pushed into the tube 136 it engages the rounded off portion 135 of the arm 134 thus lifting the latter back to the normal position shown in Figure 26 whereby a downward swinging movement is given to the lug 124 back into the path of the free end 123 of the arm 120 to arrest the latter on its return to uppermost position and thereby turn the clutch or coupling 40 member 110 back into normal position, that is, out of engagement with the corresponding recess 116 to disconnect the hub 106 from the enlarged portion 107 of the shaft 108. It is understood that when this takes place the rotation of the 45 shaft 108 ceases while the continually driven gear wheel 105 keeps on rotating. By reference to Figure 26 it will be noticed that the top and bottom of the guide and delivery tube 136 are provided with cut out portions 142, 143 for the passage of the rounded-off free end 135 of the arm 134 to allow movement thereof as above explained. From the foregoing it will be seen that by the arrangement described the shaft 108 is driven by power whenever a ticket 52 is pulled 55 out of the front end of the guide and delivery tube 136 to actuate the mechanisms of the unit, as hereinafter more fully described.

Hand operating mechanism

If desired, the shaft 108 may be actuated by the hand of the ticket agent in charge of the machine, or any other person, and for this purpose the following arrangement is provided, special reference being had to Figures 8 and 9: On an 65 extension 145 of the shaft 108 is mounted to rotate loosely a gear wheel 146 provided with a pawl 147 pressed on by a spring 148 in engagement with a tooth 149 formed on a disk 150 secured by a screw or other fastening means 151 to the shaft extension 145. A rack 152 is in mesh with the gear wheel 146 and this rack is formed on the rear end of a rod 153 mounted to slide on the framework 66 and extending through the front end thereof to the outside of the unit. 75

The rod 153 terminates at its outer forward end in a handle 154 adapted to be taken hold of by the ticket agent, to pull the rod 153 forward with a view to cause the rack 152 to rotate the gear wheel 146 which by means of the pawl 147 and the disk 150 now rotates the shaft 108 the same as above described in reference to the driving mechanism for driving the shaft 108 from the gear wheel 105. It is understood that on pushing the handle 154 rearward, the rack 152 rotates the gear wheel 146 in a reverse direction thus causing the pawl 147 to travel on the peripheral face of the disk 150 without, however, rotating the shaft 108.

Actuating mechanism

The shaft 108 is connected with an actuating mechanism 160 (see Figures 5, 6a, 12 and 13) which actuates and controls the following devices, namely, a main printing device for printing the body 56 including the destination 57 and the fare 58, a second printing device for printing the date 59, the identification character 60, and the ticket number 61, inking devices for the said printing devices, a ticket cutting-off device, and a ticket accounting means.

The actuating mechanism 160 is mounted on the auxiliary framework 127 located in front of the shaft 108, and is arranged as follows: On the shaft 108 is secured a gear wheel 161 in mesh with a gear wheel 162 secured on a shaft 163 journaled in the auxiliary framework 127. On the shaft 163 are secured four drive wheels 164, 165, 166 and 167, each provided with a friction roller 168 adapted to successively engage four radial slots 173 of four star wheels 174, 175, 176, and 177 attached to or forming part of gear wheels 178, 179, 180, and 181 mounted to rotate loosely on a shaft or rod 182 forming part of the auxiliary framework 127. Each of the star wheels 174, 175, 176 and 177 is provided with four peripheral segmental faces intermediate the slots 173 and adapted to be engaged by segmental locking members 184 forming parts of the corresponding drive wheels 164, 165, 166 and 167. Each star wheel 174, 175, 176, and 177 and its companion gear wheel 178, 179, 180, and 181 is given one quarter of a revolution for each revolution of the drive wheel 164, 165, 166, and 167, respectively. The gear wheels 178, 179, 180, and 181 are in mesh with intermediate gear wheels 185, 186, 187, and 188 (see Figure 6a) mounted to turn loosely on a shaft or rod 189 forming part of the auxiliary framework 127. The intermediate gear wheels 185, 186, 187, and 188 are in mesh with pinions 190, 191, 192, and 193 mounted to rotate loosely on a shaft or rod 194 forming part of the auxiliary framework 127. The pinions 190, 191, 192, and 193 are attached to or form part of cams 195, 196, 197, and 198 having cam grooves 199 engaged by pins or friction rollers 200 arranged on levers 201, 202, 203, and 204 fulcrumed on a shaft or rod 205 forming part of the auxiliary framework 127. It will be noticed that each of the gear wheels 178, 179, 180, and 181 during this quarter revolution imparts a full revolution by the corresponding intermediate gear wheel 185, 186, 187, or 188 to the corresponding pinion 190, 191, 192, or 193, and as the star wheels 174, 175, 176, and 177 are consecutively driven by their drive wheels 164, 165, 166, and 167, as above explained, it is evident that the levers 201, 202, 203, and 204 are successively given a full forward and backward rocking motion.

Main printing device and inking means therefor

The rocking levers 201 and 204 located on opposite sides of the main framework 66 control the main printing device and its inking means, and for this purpose the following arrangement is made, special reference being had to Figures 5, 6, 6a, 14, 15, 16, 17, 18, 19, and 20. The rocking levers 201 and 204 are provided at their free ends with studs 206, 207, of which the stud 206 pivotally connects with the rear end of a lengthwise extending link 210, and the stud 207 engages a slot in the rear end of a lengthwise extending link 211 (see Figure 18). The forward ends of the links 210 and 211 are provided with studs 212 and 213 engaging segmental slots 214, 215 formed in gear wheels 216, 217 mounted to turn on a shaft or rod 218 held on an auxiliary framework 219 attached to the main framework 66 a distance in advance of the auxiliary framework 127. The gear wheels 216, 217 are in mesh with gear wheels 220 and 221 secured on a shaft 222 journaled in side arms 223 and 224 forming part of the shaft or rod 218, thus constituting a swing frame adapted to swing up and down. The side arms 223 and 224 extend rearwardly from the shaft or rod 218, and in the free ends of the said side arms is journaled a shaft 225 carrying the main printing cylinder 226 provided on its peripheral face with type 227 for printing the body 56 and the destination 57 onto the strip of paper 53. The shaft 225 of the printing cylinder 226 is provided with gear wheels 228, 229 in mesh with the gear wheels 220 and 221 so that the rotary motion given to the gear wheels 216, 217 is transmitted by the gearing described to the printing cylinder 226 to impart a complete revolution to the printing cylinder 226 whenever the corresponding lever 201 or 204 is actuated as above explained.

Inking device for the main printing device

On the shaft 222 is secured an inking roller 230 in peripheral engagement with the type 227 to ink the latter, and the face of this inking roller 230 is in engagement with an inking pad of sponge or similar material 231 saturated with ink contained in an ink reservoir 232 mounted on the auxiliary framework 219.

The inking pad 231 is mounted in the lower contracted portion of the ink reservoir 232, and its under side is segmental to engage the face of the inking roller 230 at the time when the side arms 223 and 224 are in uppermost position and the bottom of the type 227 is a distance above the strip of paper 53, as shown in Figure 18. It is understood that the swing frame formed of the shaft or rod 218 and the side arms 223 and 224 is held normally in an uppermost position by a spring 235 attached at its lower end to the side arm 224 and at its upper end to the auxiliary framework 219 (see Figure 18). When the lever 201 is actuated from its cam 195 then a rearward swinging motion is given to the said lever 201 to cause the link 210 to turn the gear wheel 216 in the direction of the arrow x whereby a rotary motion is given to the inking roller 230 in the direction of the arrow x' and the printing cylinder 226 in the direction of the arrow x'' to ink the type 227 during the time the swing frame is in uppermost position and the type 227 is a distance above the strip of paper 53. During the rearward movement of the lever 201 the gear wheel 217 is given a quarter revolution, and the gear wheels 217, 221, and 229 are so proportioned 75

that a full revolution is given to the printing cylinder 226 at the time.

Platen

The printing cylinder 226 coacts with a platen 240 provided at the sides with gibs 241 engaging longitudinal guideways 242 formed on the base 65 of the main framework 66. A spring 243 is connected at its forward end to a lug 244 attached to the under side of the platen 240, and the rear end of said spring 243 is attached to a pin 245 secured to the base 65. By the arrangement described, the spring 243 normally holds the platen 240 in rearmost position. The strip of paper 53 passes over the platen and is held against upward movement at its side edges by retaining plates 246 secured to the top of the platen 240 at the sides thereof (see Figure 20). The platen 240 is provided at the rear side with a rack 250 in mesh with a gear wheel 251 secured on the shaft 225 of the printing cylinder 226 and hence when the latter is rotated in the direction of the arrow α^2 then a forward sliding movement is given to the platen 240 by the gear wheel 251 meshing with the rack 250. During the return swinging movement of the lever 201 the gear wheel 216 and the printing cylinder 226 are rotated in the reverse direction of the arrows α and α^2 and a return movement is thus given to the platen 240 aided by the spring 243, it being understood that during this movement the type 227 is out of engagement with the strip of paper 53 and the latter remains stationary during this first forward and return movement of the platen 240. The cams 195, 196, and 197 have concentric grooves (see Figure 12) to impart an uninterrupted rocking motion to the corresponding levers. The cam groove 199 of the cam 198 is formed of two concentric portions connected with each other (see Figure 12a) to impart an intermittent rocking motion to the lever 204, that is, to hold the lever 204 temporarily at a standstill after having completed its rearward stroke, to allow the printing cylinder 226 to move out of engagement with the strip of paper 53 after the impression is made and prior to rotating the printing cylinder 226 in the reverse direction of the arrow α^2 . The teeth of the gear wheel 251 on the printing cylinder 226 and those of the rack 250 are preferably of sufficient depth to remain in mesh whether the printing cylinder 226 is in lowermost or uppermost position, thus insuring correct feeding of the strip of paper 53.

Impression

In order to swing the side arms 223 and 224 downward with a view to move the type 227 in contact with the strip of paper 53 to make an impression thereon, the following arrangement is made (see Figures 18 and 19). The stud 207 of the rocking lever 204 besides engaging the slot 208 of the link 211 is pivotally connected with a bar 260 extending forwardly alongside the link 211. The forward end of the bar 260 is provided with a pin or screw 261 engaging a guide slot 262 formed in the link 211 to support the forward end of the bar 260 and guide the same in its sliding movement, as hereinafter more fully explained. On the pin 261 is mounted to swing a lever 263 provided at its rear end with a lug 264 on which presses the free end of a spring 265 attached to the bar 260. The downward swinging movement of the rear end of the lever 263 is limited by a stop lug 265 extending across the top of the bar 260. The forward end of the

lever 263 is provided with a cam 266 adapted to engage a cam face 267 formed on an extension 268 of the side arm 224, which latter is limited in its upward movement by a stop lug 269 engaging the auxiliary framework 219. It will be noticed that when the lever 204 is rocked its stud 207 first travels a short distance in the slot 208 of the link 211 without moving the latter, but the stud 207 imparts during this time a sliding movement to the bar 260 whereby the cam 266 in engagement with the cam surface 267 imparts a downward swinging movement to the side arm 224 and consequently to the swing frame of which the side arm 224 forms a member and carries the printing cylinder 226. This downward movement of the swing frame causes the printing cylinder 226 to move downward and its type 227 into engagement with the strip of paper 53 to press the latter into firm contact with the platen 240. The printing cylinder 226 is now rotated by the lever 204 imparting a sliding movement to the link 211 to rotate the gear wheel 217, as previously explained, thus rotating the printing cylinder 226. As the platen 240 now travels again forward by the action of the gear wheel 251 in mesh with the rack 250 it is evident that an impression is made on the strip of paper 53 by the type 227 and at the same time the strip of paper is fed forward the distance of the length of the ticket. As previously stated, the printing cylinder 226 makes one complete revolution and when this is completed the cam 266 drops off the rear end of the cam surface 267 thus allowing the spring 235 to return the swing frame and consequently the printing cylinder 226 to uppermost position. When this takes place, the strip of paper 53 is released by the type 227 and the platen 240 now returns to rearmost position on turning the printing cylinder in a reverse direction during the return forward movement of the lever 204. It is understood that the cam 266 is given a swinging movement on its return movement on the cam surface 267 to allow return movement of the swing frame carrying the printing cylinder 226, and when the bar 260 reaches the end of its forward movement the cam 266 returns to normal position on the cam surface 267 by the action of the spring 265 on the lug 264. It is understood that during the movement of the lever 201 the type 227 is inked and during the next following movement of the lever 204 an impression is made on the strip of paper 53 and the latter is fed forward the length of one ticket. The type 227 represents the body 56 and the destination 57, and in addition type 275 is provided for printing the fare 58. This type 275 is preferably arranged on the peripheral face of a type-carrying body 276 of polygonal shape inserted in a recess in the printing cylinder 226. Each side of the body 276 contains the type 275 representing different fares to permit of changing the body 276 whenever a change in the fare is made. It will be noticed that the type 275 prints the fare 58 onto the strip of paper 53 together with the body 56 and the destination 57.

Printing devices for the date, identification character, and consecutive ticket numbers

In order to print the date 59 and the station-identifying character 60 onto the strip of paper, use is made of a printing device 280, and to print the consecutive numbers 61 onto successive tickets use is made of a consecutive number printing device 281. The printing device 280 is of cylin-

drical shape and is provided on its peripheral face with type for each month, type for each day of the month, type for each year, and a station-identifying character, say a letter of the alphabet, to indicate the station at which the tickets are issued, it being understood that each station along the route uses a different identifying character 60. The date printing device is of the usual construction to allow convenient change of the date from day to day and year to year, and it is not deemed necessary to show or describe this date printing device in detail, it being sufficient to state that at the beginning of a day's work the necessary change is made as to the proper date.

The consecutive number printing device 281 is of usual construction and hence it is not deemed necessary to describe the same in detail. The printing devices 280 and 281 (see Figures 5, 6, 21, 22, 23, 24, 25) are mounted on shafts 300 and 301 journaled in a carriage 302 and engaging vertical slots 303 and 304 formed in an auxiliary framework 305 attached to the main framework 66. The printing devices 280 and 281 are inked by inking rollers 310 and 311 supplied with ink from ink fountains 312, 313 mounted on the auxiliary framework 305. The shafts 314 and 315 of the inking rollers 310 and 311 are journaled in swing frames 316 and 317 mounted to swing loosely on the shafts 300 and 301 as a fulcrum. The swing frames 316 and 317 are provided with segmental gear wheels 318 and 319 in mesh with racks 320 and 321 formed on a slide 322 provided with lengthwise extending slots 323 engaged by supporting studs 324 mounted on the carriage 302 (see Figures 21, 23, and 25). The slide 322 is provided with a vertical slot 325 engaged by a stud 326 held on an extension 327 of the link 210, previously mentioned, and controlled by the rocking lever 201. It will be noticed that when a rearward and forward sliding movement is given to the link 210 then its extension 327 and stud 326 impart a similar sliding movement to the slide 322 to cause the racks 320 and 321 to turn the segmental gear wheels 318 and 319, this imparting swinging movement to the swing frames 316, 317 to cause the inking rollers 310 and 311 to ink the printing devices 280 and 281. It is understood that during the rearward movement of the slide 322 the inking rollers 310 and 311 travel downward on the peripheral face of the printing devices 280 and 281 to insure inking of the bottom portions of the said printing devices 280 and 281 to make the proper impressions in the tickets whenever the carriage 302 is caused to slide downward, as hereinafter more fully explained. The carriage 302 is normally in the uppermost position shown in Figures 21, 22, 23, 24, and 25, and is moved down and back to uppermost position by mechanism connected with the rocking lever 202 previously mentioned. The rocking lever 202 is for this purpose pivotally connected at its upper end with the rear end of a link 330 extending forwardly and being provided at its forward end with a slot 331 (Figure 21) engaging a stud 332 held on the auxiliary framework 305 (see Figures 22 and 24). The forward end of the link 330 is provided with a rack 333 in mesh with a gear wheel 334 secured on a shaft 335 journaled on the auxiliary framework 305. On the shaft are secured two gear wheels 336 in mesh with corresponding gear wheels 337 secured on a shaft 338 likewise journaled on the auxiliary framework 305. The two sets of gear wheels 336, 337 are in mesh with corresponding vertically disposed racks

340 and 341 attached to the carriage 302. When the rocking lever 202 swings rearwardly then the link 330 and its rack 333 are moved in the same direction, and in doing so the rack 333 turns the gear wheel 334 whereby the sets of gear wheels 336 and 337 are rotated to move the racks 340 and 341 and consequently the carriage 302 in a downward direction to cause the printing devices 280 and 281 to make impressions on the strip of paper and thereby print the date, the identification character, and a ticket number on the strip of paper adjacent the ends of the ticket, as will be readily understood by reference to Figures 34 and 35. When the rocking lever 202 swings forward during its return movement then a reverse movement is given to the gearing above described whereby the carriage 302 is moved up to normal position this moving the printing devices 280 and 281 out of engagement with the strip of paper 53 held stationary during the time the impressions are made by the printing devices 280 and 281.

In order to advance the number wheels of the consecutive number printing devices 281 for each impression to print consecutive numbers on successive tickets, use is made of a link 350 (see Figures 25 and 32) connected with the rocking lever 203. For the purpose mentioned the link 350 is provided with spaced depending lugs 351 and 352 between which extends the upper end of the actuating lever 353 of the consecutive number printing device 281 and hence when the lever 203 is rocked a corresponding movement is given to the actuating lever 353 to turn the consecutive number printing device 281 to the next number.

Ticket cutting-off device

The ticket cutting-off device is actuated by the link 350 above mentioned, and for this purpose the forward end of the link 350 is pivotally connected with an arm 360 secured on a shaft 361 journaled in the forward portion of the main framework 66. On the shaft 361 is secured an arm 362 carrying a cut-off knife 363 operating in conjunction with a die 364 over which passes the strip of paper, as plainly shown in Figure 32. The die 364 is attached to the base 65 of the main framework 66 and is located immediately in the rear of the tube 136 through which passes the ticket 52 to the front end of the unit. The strip of paper 53 is guided to the die 364 through a short guide tube 365 mounted on the base 65 in the rear of the die 364. It will be noticed that when the lever 203 rocks rearwardly a rearward movement is given to the link 350 whereby a swinging movement is given to the arms 360 and 362 to cause the knife 363 to cut off the ticket 52 from the strip of paper 53 and at the time the strip of paper 53 is at a standstill with the forward end projecting a short distance beyond the forward end of the guide and delivery tube 136. During the return movement of the lever 203 the knife 363 is returned to uppermost position thus allowing the attendant of the machine to pull the ticket out of the tube 136 of the corresponding unit.

Accounting device

On the front auxiliary framework 133 is secured a transversely extending shaft or rod 370 on which is mounted to turn a number counter 371 of any approved construction for displaying a number corresponding to the consecutive ticket number 61 on the ticket 52 extending in the tube 136 at the time. The number counter 371 dis-

plays a number through a window 372 formed in the front 373 of the main framework 66, and the number counter may be of any approved construction. In order to actuate the number counter 371 the arm 360 is provided with an extension 375 (see Figure 32) provided with spaced pins 376, 377 adapted to engage the operating arm 378 of the number counter 371 to actuate the latter, that is, to display the number of the ticket in the tube 136 at the time. It is understood that the number counter 371 is of the non-reversing type, that is, the arm 378 actuates only the number counter during the return movement of the link 350. The two accounting tapes 380 and 381 are arranged in the front portion of the unit and display through windows 382 and 383 arranged in the front of the main framework 66 (see Figure 3). Each of the accounting tapes is provided with two sets of numerals 384 and 385 (see Figure 30) of which the numerals 384 indicate the number of tickets sold, and the numerals 385 indicate the total amount in dollars and cents of the corresponding tickets sold. Thus, as shown at the top of Figure 30, is disclosed 245 tickets to the value of \$220.50 with the price of each ticket at 90 cents, as indicated in Figures 34 and 35. The tape 380 is preferably used for indicating the daily sales and is more particularly designed for the use of the ticket seller in charge of the machine and is set daily to zero. The other tape 381 is more particularly designed for a given accounting period as decided on by the general accounting office. As the working of both tapes 380 and 381 is alike, it suffices to describe the mounting of one tape in detail, special reference being had to Figure 27. The tape 380 unwinds from a drum or spool 400 mounted to rotate on a shaft or rod 401 fixed on the auxiliary framework 133, and the said drum is pressed on by a helical spring 402 having one end attached to the shaft or rod 401 and the other to the drum, as plainly indicated in Figure 27. The tape 380 after leaving the drum 400 passes around a pair of sprocket wheels 405 secured on a shaft 406 journaled on the auxiliary framework 133. The tape 380 next passes under an idler 407 mounted on the auxiliary framework 133 and then extends upward in front of the corresponding window 382 or 383 to wind on a winding up drum or spool 408 mounted to rotate loosely on the rod or shaft 370 previously mentioned. A helical spring 409 is secured at one end to the rod or shaft 370 and at the other end to the drum 408 to place the latter under tension with a view to wind up the tape as the latter is caused to travel intermittently by the action of the sprocket wheels 405. The spring 409 is somewhat weaker than the spring 402 to allow of rewinding the tape 380 on the drum 400 at the time the operating devices for the tapes are released, as hereinafter more fully explained. An intermittent turning motion is given to the sprocket wheels 405 by the following mechanism: On the shaft 406 is secured a ratchet wheel 415 engaged by two pawls 416 and 417 fulcrumed at 418 on the extension 375 of the link 350. The pawls 416 and 417 are pressed into engagement with the ratchet wheel 415 by springs 419 and 420, and the said pawls 416, 417 are provided with forwardly extending handles 421 and 422 extending through an opening 423 formed in the front 373 of the main framework 66. The handles 421 and 422 for the operating mechanism of the tape 380 are under the control of the ticket seller in charge of the machine while the handles for the operat-

ing mechanism of the tape 381 are enclosed in a suitable key-controlled lock 425 (see Figure 3) and mounted on the front face of the front end 373 of the main framework 66. Thus the handles 421 and 422 for resetting the tape 380 can be readily pressed by the ticket seller to allow rewinding of the tape 380 on the drum 400 at the beginning of the day's work. The other tape 381 is reset at the end of a desired longer period by an authorized person from the accounting office 10 having the key for the lock 425 to allow of opening the latter to obtain access to the handles 421, 422 of the operating mechanism for the tape 381. It is understood that when the link 350 moves rearwardly the pawls 416 and 417 are carried along 15 by the extension 375 of the link 350 and in doing so the said pawls turn the ratchet wheel 415 and consequently the shaft 406 carrying the sets of sprocket wheels 405 to advance the tapes 380 and 381 to display the next set of numerals in 20 the windows 382, 383. During the return movement of the link 350 the pawls 416 and 417 glide over the teeth of the ratchet wheel 415 without turning the latter.

Automatic stopping device

In case the strip of paper 53 runs out on the spool 62, it is desirable to stop the actuating mechanism, and for this purpose an automatic stopping device is provided arranged as follows, special 30 reference being had to Figures 28 and 29: The strip of paper 53 after leaving the roll or drum 62 passes through a guide tube 430 arranged in the bottom portion of the main framework 66, and the said tube is provided on the top and bottom with openings 431 and 432 for the passage of the free end of a locking lever 433. The free end of the locking lever 433 normally rests on top of the strip of ticket paper 53, as plainly shown in Figures 28 and 29, to hold the lever normally in 40 unlocking position. The lever 433 is fulcrumed on a stud 434 attached to a bracket 435 forming part of the auxiliary framework 127 (see Figure 5), and the said lever 433 is pressed on by a spring 436 held on the stud 434 to impart a swinging 45 movement to the lever 433 whenever the strip of paper 53 runs out from under the free end of the said locking lever 433. The upper end of the locking lever 433 is normally out of the path of a lug 437 arranged on the arm 128 previously 50 mentioned, but when the locking lever 433 swings into locking position it engages the lug 437 and thus locks the arm 128 against swinging in a rearward direction and thereby preventing lifting of the arm 125 to release the locking arm 120 of 55 the clutch member 110. Thus the hub 106 is not coupled to the shaft 108 in case the ticket 52 is pulled out from under the arm 134 normally controlling the arm 128, as above explained.

Modified printing mechanism

In case it is desired to use a partly printed strip of paper 55, as previously explained, then use is made of the main printing cylinder 226 provided with type 440 representing the destination 57 65 only, as shown in Figure 33. In this case the contact of the type 440 with the strip of paper 53 is not sufficient to feed the latter forward, and in order to insure a positive forward feeding of the strip of paper the latter is provided with 70 spaced pairs of oppositely disposed apertures 441 (see Figure 35) adapted to be engaged by pins 442 held on a U-shaped spring frame 443 secured at the free ends of its side arms 444 to the platen 240. The side arms 444 register with the grooved 75

portions 445 arranged at the ends of the printing cylinder 226 and hence when the printing cylinder moves downward, as previously explained, then it engages the side arms 444 and thus swings the frame 443 downward thereby moving the pins 442 into engagement with a corresponding pair of apertures 441. When the platen 240 is next moved forward the pins 442 positively feed the strip of paper 53 forward during the time the type 440 and the fare die 275 make impressions on the strip of paper. As shown in Figure 33, the platen may be provided, besides the rack 250 in mesh with the gear wheel 251, with a rack 450 at the other side in mesh with a gear wheel 451 attached to the corresponding end of the printing cylinder 226.

Operation

The operation is as follows:

When the motor 70 is running then a continuous rotary motion is given to the gear wheels 105 of the units mounted in the casing 50. When a passenger calls for a ticket say at "Startout, N. Y." station for "Westchester, N. Y." then the ticket seller in charge of the machine pulls out the ticket 53 at the "Westchester" unit and collects the fare of 90 cents. On pulling the ticket 53 out of the guide and delivery tube 136 it moves out from under the free rounded-off end 135 of the arm 134 and hence the latter is released and swings downward by the action of its spring 137 (see Figures 26, 28) and hence a rocking motion is given to the shaft 132 which by the arm 131, the link 130, and the arm 122 imparts a rocking motion to the shaft 126 whereby the arm 125 (see Figure 7) is swung upward out of engagement with the arm 120 of the coupling or clutch member to allow the spring 121 to swing the said arm 120 rearwardly and thus turn the coupling member 110 to couple the rotating gear wheel 105 to the shaft 108 to rotate the latter. The rotary motion of the shaft 108 is transmitted by the gear wheels 161 and 162 to the shaft 163 carrying the several drive wheels 164, 165, 166, and 167.

First period

The drive wheel 164 by its pin or friction roller 168 imparts a quarter turn to the star wheel 175 which by its gear wheel 178 rotates the intermediate gear wheel 185 which imparts a rotary motion by the pinion 190 to the cam 195, the latter making one revolution during the quarter revolution given to the star wheel 174. During the first half of the revolution of the cam 195 a rearward swinging movement is given to the lever 201 by which the link 210 actuates the gear wheel 216 and the slide 322 whereby the types 227 and 275 on the main printing cylinder 226 and the printing devices 280 and 281 are inked by the corresponding inking rollers 230, 310, and 311.

Second period

When the cam 195 has completed its revolution then the pin or friction roller 168 of the fourth drive wheel 167 imparts a quarter turn to the star wheel 177 which by its gear wheel 181 and the intermediate gear wheel 188 and the pinion 193 rotates the cam 189 whereby a rocking motion is given to the lever 204. During the rearward movement of the rocking lever 204 the printing cylinder 226 is moved downward to engage the types 227 and 275 with the strip of paper 53 to make an impression thereon, that is, printing the body 56, the destination 57, and the fare 58 onto the strip 53, as indicated on the right-

hand portion of Figure 34, and at the same time the platen 240 is fed forward thus moving the strip of paper 53 the length of a ticket, and when this has been done the rocking lever 204 starts on the return stroke in a forward direction whereby the printing cylinder 226 is lifted and moved out of engagement with the strip of paper, and the said strip of paper 53 now remains at a standstill while the platen 240 returns with the return movement of the printing cylinder 226. The printing cylinder 226 during its upward movement rotates in the reverse direction of the arrow X² thus moving the platen 240 back to its rearmost position aided by the spring 265.

Third period

Immediately after the cam 198 has completed its revolution the pin or friction roller 168 of the drive wheel 165 imparts a quarter turn to the star wheel 175 which by the gear wheel 179, the intermediate gear wheel 186, and the pinion 191, rotates the cam 196 thus imparting a rocking motion to the rocking lever 202. During the rearward movement of this rocking lever 202, the link 330 imparts a rearward movement to the rack 333 (see Figure 22) whereby a downward sliding movement is given to the carriage 302 to move the printing devices 280, 281 into contact with the now stationary strip of paper 53, to make impressions thereon, that is, to print the date (say November 20, 1919), the station-identifying character (say the letter G), and a ticket number (say 065413) on this strip, as shown in Figure 34. During the return swinging movement in a forward direction of the rocking lever 202 the carriage 302 returns to uppermost position and the printing devices 280 and 281 move out of engagement with the strip of paper.

Fourth period

When the strip of paper 53 is fed forward during the first period of the actuating mechanism, the forward end of the paper with a ticket printed thereon passes into the tube 136 with the forward end projecting a short distance beyond the front end of the tube. After the completion of the revolution of the cam 196 the friction roller 168 of the drive wheel 166 imparts a quarter revolution to the star wheel 176 by which its gear wheel 180, the intermediate gear wheel 187, and the pinion 192, impart a single revolution to the cam 197 whereby a rocking motion is given to the lever 203, which by the link 350 actuates the cutting-off knife 363 to cut off the ticket 52 from the strip 53, and at the same time the link 350 actuates the counter 371 to turn the latter to the number printed on the ticket visible on the end that extends from the tube 136. At the same time the accounting tapes 380, 381 are advanced. The tape 380 discloses the number of tickets sold by the ticket seller, say during a day, and the total amount thereof while the tape 381 records the number of tickets sold during a longer period and the total amount thereof.

During the return movement of the link 350 the knife 363 is raised to the position shown in Figure 32 and at the same time the link imparts a rocking motion to the actuating arm 353 of the consecutive number printing device 281 to advance the latter to the next number. When the strip of paper 53 is fed forward the first period, as above explained, and enters the tube 136 then it swings the arm 134 upward whereby a return rocking movement is given to the shaft 132 which, by the arm 131, the link 130, and the

arm 128, imparts a return rocking movement to the shaft 126 whereby the arm 125 is swung downward into the path of the arm 120 to arrest the latter on the gear wheel 105 completing one revolution, thus moving the clutch or coupling member 110 out of engagement with the hub 106 of the gear wheel 105 to stop the rotary motion of the shaft 108. When this takes place the fourth period of the actuating mechanism is completed and the several parts except the driving mechanism are at rest.

The above operation is repeated on the ticket seller pulling out the projecting end of the ticket in the tube 136.

The ticket paper is preferably provided with the usual safeguards to protect against counterfeiting.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:—

1. In a machine of the class described, a plurality of units, each having ticket printing, issuing, and accounting devices each having individual and independent feeding means, each unit having an actuating device for the printing, issuing, accounting and feeding devices, driving mechanism for the said actuating device of a unit, a main driving shaft selectively connected with the said driving mechanisms of the several units, and a hand-controlled operating device connected with the said driving mechanism of a unit.

2. In a machine of the class described, a plurality of ticket producing units, each comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter forward the length of a ticket, a cutting off device for cutting off the printed ticket from the strip, actuating means for the said printing and cutting devices, a driving mechanism common to the several units for the said actuating means, and a controlling device controlled by the cut-off ticket and selectively controlling the said actuating means.

3. In a machine of the class described, a ticket producing unit, comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter intermittently forward the length of a ticket, accounting devices indicating the transactions of a unit, a cutting off device for cutting off the printed ticket from the strip, actuating means for the said printing, feeding, accounting, and cutting off devices, a driving mechanism for the said actuating means, and a controlling device for the said driving mechanism and controlled by the said cut off ticket.

4. In a machine of the class described, a ticket producing unit, comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter intermittently forward the length of a ticket, accounting devices indicating the transactions of a unit, a cutting-off device for cutting off the printed ticket from the strip, actuating means for the said printing, feeding, accounting, and cutting off devices, a driving mechanism for the said actuating means, a controlling device for the said driving mechanism and controlled by the said cut off ticket, and a locking device controlled by the strip of ticket paper for locking the said controlling device on the strip of paper running out of engagement with the locking device.

5. In a machine of the class described, a ticket producing unit comprising a printing cylinder adapted to print ticket matter onto a strip of

ticket paper, guiding means for the strip, a slidable platen adapted to coast directly with the said printing cylinder for making an impression on the strip of paper and for feeding the paper forward the length of a ticket while printing the ticket.

6. In a machine of the class described, a ticket producing unit comprising a printed cylinder adapted to print ticket matter onto a strip of ticket paper, guiding means for the strip, a slidable platen adapted to coast with the said printing cylinder, platen driving means connecting the said printing cylinder with the said platen to feed the latter forward the length of a ticket while printing the ticket, and mechanism moving the said printing cylinder into engagement with the said ticket paper immediately prior to moving the platen forward, and to move the printing cylinder out of engagement immediately prior to the platen reaching the end of its stroke.

7. In a machine of the class described, a ticket producing unit comprising a printing cylinder, adapted to print ticket matter onto a strip of ticket paper, a slidable platen adapted to coast with the said printing cylinder, platen feeding mechanism connecting the said printing cylinder with the said platen to feed the latter forward the length of a ticket while printing the latter, mechanism moving the said printing cylinder into engagement with the said ticket paper immediately prior to moving the platen forward and to move the printing cylinder out of engagement immediately prior to the platen reaching the end of its stroke, and a spring connected with the platen to return the latter after the platen having reached the end of its forward stroke.

8. In a machine of the class described, a main printing device for printing the body of a ticket and the fare onto a strip of ticket paper, the said main printing device including a movable platen and a feeding means for intermittently reciprocating the said platen, an inking means for the said printing means, a second printing device for printing the date, an identification mark, and a number on the ticket, the said printing devices being arranged one in front of the other, a cutting-off device for cutting off the printed ticket, and actuating means connected with the said printing devices, the said inking device and the said cutting off device for actuating the said devices.

9. In a machine of the class described, a main printing device for printing the body of a ticket and the fare onto a strip of ticket paper, an inking means for the said main printing means, a second printing device for printing the date, an identification mark, and a number on the ticket, the said printing devices being arranged one in front of the other, a cutting off device for cutting off the printed ticket, and actuating means connected with the said printing devices, the said inking device, and the said cutting off device for actuating the said devices, the said actuating means having cam-controlled mechanisms, one for the said inking device, one for the said main printing device, one for the said second printing device, and one for the said cut-off device to actuate the said devices in the sequence mentioned.

10. In a machine of the class described, a main printing device for printing the body of a ticket and the fare onto a strip of ticket paper, the said main printing device including a movable platen and feeding means for intermittently reciprocating the said platen, an inking means for the said main printing means, a second printing device

- for printing the date, an identification mark, and a number on the ticket, the said printing devices being arranged one in front of the other, a cutting-off device for cutting off the printed ticket, and actuating means connected with the said printing devices, the said inking device, and the said cutting off device for actuating the said devices, the said actuating means having cam controlled mechanisms, one for the said inking device, one for the said main printing device, one for the said second printing device, and one for the said cut-off device to actuate the said devices in the sequence mentioned.
11. In a machine of the class described, a main printing device for printing the body of a ticket and the fare onto a strip of ticket paper, an inking means for the said main printing means, a second printing device for printing the date, an identification mark, and a number on the ticket, the said printing devices being arranged one in front of the other, a cutting-off device for cutting off the printed ticket, an accounting device operating in unison with the said cutting-off device, the said cutting-off device, and the said accounting mechanism being arranged in front of the said second printing device, and actuating means connected with the said printing devices, the said inking device, the said cutting-off device, and the said accounting mechanism, the said actuating means having cam controlled mechanisms, one for the said inking device, one for the said main printing device, one for the said second printing device, and one for both the said cutting-off device and the said accounting device to actuate the said several devices in the sequence mentioned.
12. In a machine of the class described, a casing provided with tiers of cells open at the front, self-contained ticket producing units, each containing ticket feeding and severing mechanism, one removably held in each cell, and a power driving mechanism mounted in the casing and common to the said units.
13. In a machine of the class described, a casing provided with tiers of cells open at the front, a ticket producing unit including ticket printing, issuing, and accounting devices removably held in each cell, and a driving mechanism mounted in the said casing and adapted to selectively drive the said devices in each unit.
14. In a machine of the class described, a casing provided with tiers of cells open at the front, a ticket producing unit including ticket printing, issuing, and accounting devices removably held in each cell, each unit having a driving coupling member for the said devices and a driving gear mounted in the said casing and having coupling members one for each unit and engaging the coupling member of the corresponding unit.
15. In a machine of the class described, a casing provided with tiers of cells open at the front, a ticket producing unit including ticket printing, issuing, and accounting devices removably held in each cell, each unit having an actuating mechanism for the said devices and provided with a coupling member, and a driving gear mounted in the said casing and having coupling members, one for each unit, each coupling member of a unit being adapted to engage the corresponding coupling member of the driving gear on inserting a unit into the corresponding cell.
16. In a machine of the class described, a casing provided with tiers of cells open at the front, ticket producing units, one in each cell, a power driving gear mounted in the casing and common to the said units, and a hand-operated power transmitting mechanism mounted on each unit to actuate the same independently of the said power driving gear.
17. In a machine of the class described, a casing provided with tiers of cells open at the front, a ticket producing unit including ticket printing, issuing, and accounting devices removably held in each cell, each unit having an actuating mechanism for the said devices, hand controlled operating means mounted on each unit for operating the corresponding actuating devices by hand power, and a power driving gear mounted on the casing and common to the said units to operate the said actuating devices of the units by power.
18. In a machine of the class described, a plurality of successively driven cams each making a complete revolution, link and lever mechanisms connected with and actuated by the said cams, a main printing device mounted to swing and having a printing cylinder and an inking roller therefor, a driving gear for the said printing cylinder and the said inking roller connected with one of the said link and lever mechanisms, means imparting a swinging motion to the said main printing device and controlled by another of the said cam and lever mechanisms, and a platen over which passes ticket paper to be printed by the said printing cylinder, the said platen being mounted to slide and being geared with the said printing cylinder to impart a sliding motion to the platen while printing face of the printing cylinder is in printing contact with the ticket paper on the platen.
19. In a machine of the class described, a plurality of successively driven cams each making a complete revolution, link and lever mechanisms connected with and actuated by the said cams, a printing device mounted to slide up and down and having two printing members adapted to make impressions on ticket paper, inking devices for the said printing members, a driving gear for the said inking devices and controlled by one of the said link and lever mechanisms, and means imparting an up and down sliding motion to the said printing device and controlled by another of the said link and lever mechanisms.
20. In a machine of the class described, a ticket producing unit comprising two sets of printing devices for printing ticket matter on a strip of paper and feeding the latter forward step by step, the devices being located one in front of the other, a ticket cutting-off mechanism for cutting off a printed ticket from the strip of paper, an accounting device accounting for the tickets printed, a plurality of successively driven cams each making a complete revolution, and a corresponding plurality of link and lever mechanisms connected with and actuated by the said cams, the said link and lever mechanisms being connected with the said printing devices, the said ticket cutting-off mechanism, and the said accounting device.
21. In a mechanism of the class described, a platen mounted to reciprocate and over which extends a strip of ticket paper, a printing cylinder adapted to print ticket matter onto the said strip of paper, a gearing connecting the said printing cylinder with the said platen to reciprocate the latter, a swing frame in which the said printing cylinder is journaled, an inking roller in peripheral contact with the said printing cylinder, means rotating the said cylinder and printing roller, and means imparting a swinging motion to the said frame.

22. In a mechanism of the class described, a platen mounted to reciprocate and over which extends a strip of ticket paper, a printing cylinder adapted to print ticket matter onto the said strip of paper, a gearing connecting the said printing cylinder with the said platen to reciprocate the latter, a swing frame on which the said printing cylinder is journaled, an inking roller in peripheral contact with the said printing cylinder, successively driven cams each making a complete revolution, and link and lever mechanisms connected with the said printing cylinder, the said inking roller, and the said frame.

23. In a machine of the class described, a carriage mounted to slide up and down, spaced printing devices mounted on the said carriage and adapted to print ticket matter onto a strip of ticket paper, inking means for inking the said printing devices, successively driven cams each making a complete revolution, and link and lever connections connected with and actuated by the said driven cams, one of the said link and lever connections being connected with the said inking device to periodically ink the said printing devices, and the other of the said link and lever connections being connected with the said carriage to move the latter periodically up and down.

24. In a machine of the class described, a ticket-producing unit, comprising printing and feeding devices for printing ticket matter on a strip of paper and feeding the latter intermittently forward the length of a ticket, inking devices for the said printing devices, a cut-off device for cutting off a printed ticket from the strip of paper, and actuating means having cams, and lever mechanisms connected with the said printing, inking and cutting-off devices, the cams being driven successively and each making a complete revolution for each ticket printed.

25. In a machine of the class described, an actuating mechanism comprising a plurality of drive wheels rotating in unison, star wheels successively and intermittently rotated by the said drive wheels, cams driven successively from the said star wheels, each cam making a complete revolution for each partial revolution of the corresponding star wheels, and rocking levers actuated successively by the said cams and connected with the devices to be actuated.

26. In a machine of the class described, an actuating mechanism comprising a plurality of drive wheels rotating in unison, star wheels successively and intermittently rotated by the said drive wheels, cams driven successively from the said star wheels, each cam making a complete revolution for each partial revolution of the corresponding star wheels, rocking levers actuated successively by the said cams and connected with the devices to be actuated, a continually driven driving means, a clutch mechanism adapted to connect the said driving means with the said actuating means, and a clutch controlling mechanism controlled by a printed ticket to connect the driving means with the actuating means on removal of the ticket.

27. In a machine of the class described, means printing ticket matter successively on a strip of ticket paper, means feeding the strip of ticket paper intermittently forward, means cutting off a printed ticket from the strip of paper, and actuating mechanism for the said ticket printing, feeding, and cutting off means, continually driven driving means for the said actuating mechanism, a clutch adapted to connect the said driv-

ing means with the said actuating means, and a clutch controlling device for the said clutch mechanism and controlled by the said ticket to connect the driving means with the actuating means on removing the said ticket.

28. A machine of the class described, comprising a casing provided with tiers of cells, a ticket producing unit in each cell, the several units having means for printing tickets for the several stations along a given route, a power driving means common to the units in the casing, and a hand power mechanism for each unit to permit of actuating the same in case the said common power driving means fails to work.

29. In a machine of the class described, a casing provided with tiers of cells, a ticket producing removably held unit in each cell, the several units having means for printing tickets for the several stations along a given route, a power driving means common to the units in the casing, and an automatic controlling device adapted to connect the said power driving means with the said ticket printing means of a unit, the said controlling device being controlled by a printed ticket of the corresponding unit.

30. A machine of the class described, comprising a casing provided with tiers of cells, a ticket producing unit in each cell, the units covering the printing of tickets for the several stations along a given route, each unit being provided with a drum adapted to carry a roll of ticket paper, each unit having ticket printing, paper feeding, and ticket cutting-off devices, for printing ticket matter onto the strip of paper, feeding the latter intermittently forward, and cutting off a printed ticket from the strip of paper, a driving means common to the said devices of the several units, and an automatic controlling device adapted to selectively connect the said power driving means with the said ticket printing means of a unit, the said controlling device being controlled by a printed ticket of the corresponding unit.

31. In a machine of the class described, a ticket producing unit comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter forward the length of a ticket, a cutting off device for cutting off the printed ticket from the strip, actuating means for the said printing and cutting devices, a driving mechanism for the said actuating means, and a mechanical contact device connected to the said driving mechanism in contact with and controlled by removal of the cut off ticket and controlling the said driving mechanism.

32. In a machine of the class described, a ticket producing unit comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter forward the length of a ticket, a cutting off device for cutting off the printed ticket from the strip, actuating means for the said printing and cutting devices, a driving mechanism for the said actuating means, and an arm controlled by removal of the cut off ticket and controlling the said driving mechanism.

33. A ticket issuing unit comprising an issuing device and an actuating device therefor, arranged to position a ticket at a discharge point, means whereby a ticket located at said point controls the actuating device; a motive assembly comprising a motor and associated mechanism for driving the said ticket issuing unit, the said motive assembly and the said ticket issuing unit being coupled together and arranged for dis-asso-

ciation and re-coupling at will in intact operable condition.

34. A ticket issuing machine comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter intermittently forward the length of a ticket, a device for cutting off a printed ticket from the strip, actuating means for said printing, feeding and cutting off devices, a driving mechanism for the said actuating means, and a controlling device for the said driving mechanism controlled by a cut off ticket.

35. A ticket issuing machine comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter intermittently forward the length of a ticket, a device for cutting off a printed ticket from the strip, actuating means for said printing, feeding and cutting off devices, a driving mechanism for the said actuating means, a controlling device for the said driving mechanism controlled by a cut off ticket, and a locking device controlled by the strip of ticket paper for locking said controlling device if the strip of paper runs out of engagement with the locking device.

36. A ticket issuing machine comprising printing and feeding devices for printing ticket matter on a strip of ticket paper, and feeding the latter intermittently forward the length of a ticket, a device for cutting off printed tickets from the strip, actuating means for said printing, feeding and cutting off devices, a continuously driven driving means for said actuating means, and means controlled by removal of a ticket for connecting said driving means and actuating means and, at the end of a cycle of operation, automatically disconnecting them.

37. A ticket issuing machine comprising means for feeding a ticket strip, means for severing tickets from the strip, actuating means for the feeding and severing means, a continuously driven driving means for said actuating means, and means controlled by removal of a ticket for connecting said driving means and actuating means and, at the end of a cycle of operation, automatically disconnecting them.

38. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor, and a plurality of self-contained ticket issuing units independently and simultaneously receivable in the casing and guided thereby into operative connection with the intermediate driving devices.

39. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor, and a self-contained replaceable ticket issuing unit receivable in the casing and guided thereby into operative connection with the intermediate driving devices.

40. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor including a driving element mounted in the casing, and a self-contained replaceable ticket issuing unit including a driven element, said unit being receivable in the casing and guided thereby so that said driving and driven elements are engaged to provide driving connections between the motor and unit.

41. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor, including a plurality of driving elements mounted in the casing, and a plurality of self-contained ticket issuing

units each including a driven element, said units being independently and simultaneously receivable in the casing and guided thereby so that their driven elements are engaged with the driving elements mounted in the casing to provide driving connections between the motor and the units.

42. A ticket issuing machine comprising means for guiding a check strip; means for severing a ticket from the strip; means for presenting a severed check in delivering position; means for effecting a cycle of operation of the machine including a member effective upon removal of a check from delivering position to initiate a cycle of operation; and means for preventing initiation of such cycle of operation if there is no strip available to form a subsequent check.

43. A ticket issuing machine comprising means for guiding a ticket strip; means for severing a check from the strip; means for presenting a severed check in delivering position; means for effecting a cycle of operation of the machine including a member effective upon removal of a check from delivering position to initiate a cycle of operation; and means for preventing initiation of such cycle of operation if there is no strip available to form a subsequent check, said last means including a finger arranged to engage the ticket strip.

44. In combination, a plurality of ticket issuing units, each comprising ticket strip feeding means, means for severing tickets from the strip, and actuating means for said feeding and severing means, a driving mechanism for the actuating means common to the several units, and controlling devices in the various units each being controlled by a cut off ticket and selectively controlling its actuating means.

45. A ticket issuing machine comprising printing and feeding devices for printing ticket matter on a strip of ticket paper and feeding the latter intermittently forward the length of a ticket, a device for cutting off a printed ticket from the strip, actuating means for said printing, feeding and cutting off devices, a driving mechanism for the said actuating means, a controlling device for said driving mechanism controlled by a cut off ticket, said controlling device effecting operation of the driving mechanism upon removal of a cut off ticket, means for indicating the number of tickets issued, and means for preventing the operation of said indicating means if the strip of paper becomes exhausted.

46. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor, a plurality of self-contained replaceable units, each containing ticket issuing mechanism, receivable in the casing, rotatable means forming parts of said units arranged to operatively engage said intermediate driving devices to be rotated thereby, a clutch in each of said units between its rotatable means and its ticket issuing mechanism, and means in each of said units for effecting engagement of the clutch when a ticket is to be issued, each rotatable means being operable by the intermediate driving devices, when the clutch is disengaged, without effecting issue of a ticket.

47. A ticket issuing machine comprising a casing, a motor, intermediate driving devices arranged to be driven by the motor, a plurality of self-contained replaceable units, each containing ticket issuing mechanism, receivable in the casing, rotatable means forming parts of said units arranged to operatively and permanently engage said intermediate driving devices to be rotated

thereby when the units are in normal position within the casing, a clutch in each of said units between its rotatable means and its ticket issuing mechanism, and means in each of said units for effecting engagement of the clutch when a ticket is to be issued, each rotatable means being operable by the intermediate driving devices, when the clutch is disengaged, without effecting issue of a ticket.

48. A ticket issuing machine comprising means for feeding a ticket strip intermittently forward the length of a ticket, means for cutting off a ticket from the strip, actuating means for said feeding and cutting off means, a driving mechanism for said actuating means, and a controlling device for the said driving mechanism controlled by a cut off ticket, said actuating means including a rotary driven element and a rotary driving element which during a substantially uniform rotation imparts a non-uniform rotation directly to the driven element, said driven element controlling the feed of the ticket strip so that the strip is substantially stationary when cutting takes place.

49. A ticket issuing machine comprising means for feeding a ticket strip intermittently forward the length of a ticket, means positively actuated in both directions for cutting off a ticket from the strip, actuating means for said feeding and cutting off means, a driving mechanism for said actuating means, and a controlling device for the said driving mechanism controlled by a cut off ticket, said actuating means including a rotary driven element and a rotary driving element which during a substantially uniform rotation imparts a non-uniform rotation directly to the driven element, said driven element controlling the feed of the ticket strip so that the strip is substantially stationary when cutting takes place.

50. A ticket issuing machine comprising means for feeding a ticket strip intermittently forward the length of a ticket, means for cutting off a ticket from the strip, actuating means for said feeding and cutting off means, a driving mechanism for said actuating means, and controlling

means for the said driving mechanism, said actuating means including a rotary driven element and a rotary driving element which during a substantially uniform rotation imparts a non-uniform rotation directly to the driven element, said driven element controlling the feed of the ticket strip so that the strip is substantially stationary when cutting takes place.

51. A ticket issuing machine comprising means for feeding a ticket strip intermittently forward the length of a ticket, means positively actuated in both directions for cutting off a ticket from the strip, actuating means for said feeding and cutting off means, a driving mechanism for said actuating means, and controlling means for the said driving mechanism, said actuating means including a rotary driven element and a rotary driving element which during a substantially uniform rotation imparts a non-uniform rotation directly to the driven element, said driven element controlling the feed of the ticket strip so that the strip is substantially stationary when cutting takes place.

52. A ticket issuing machine comprising means for feeding a ticket strip to a delivering position; means for severing a ticket from the strip; driving means; a clutch between the driving means and the feeding means; and means for effecting a cycle of operation of the machine including a member effective upon removal of a check from delivering position to cause engagement of the clutch.

53. A ticket machine comprising printing means coacting with a platen to print a ticket while feeding it forward, means for supporting a printed ticket for removal from the machine, a driving mechanism for the printing means, and controlling means for the driving mechanism including an element engageable with the ticket when it is supported by said supporting means, said element being moved upon removal of the ticket to effect operation of the driving mechanism.

FRED A. PURDY.
HERBERT McLEAN PURDY.
EUGENE LETSCH.