May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

Filed Aug. 29, 1950 19 Sheets-Sheet 1

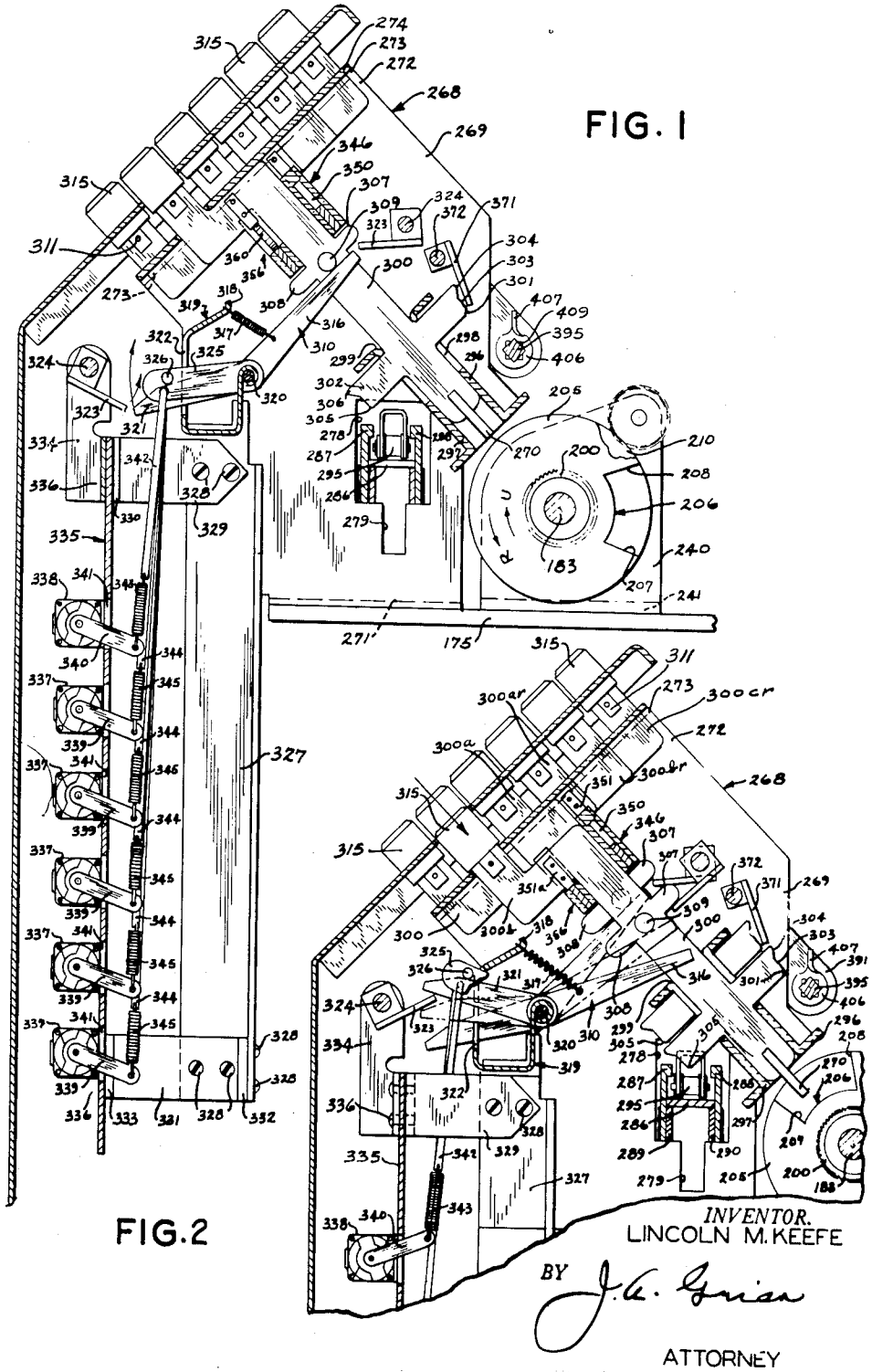


FIG. 1

FIG. 2

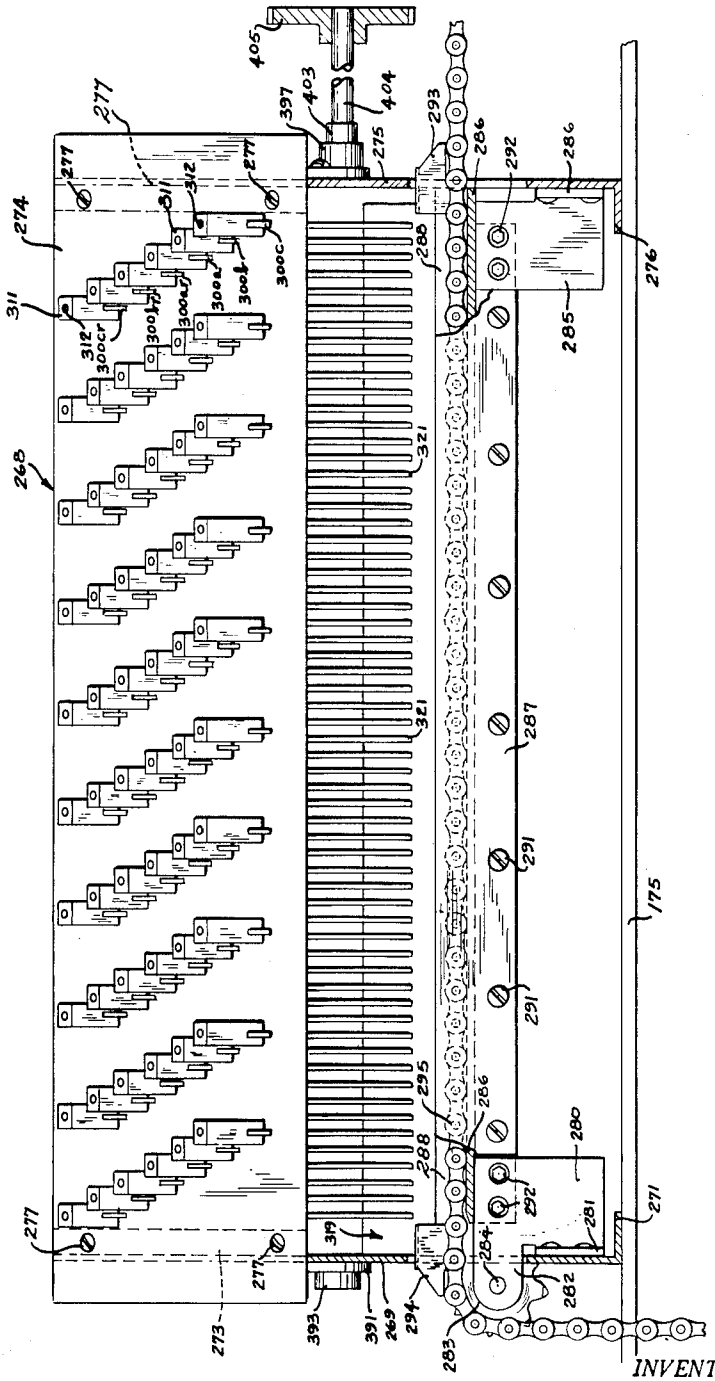
INVENTOR.
LINCOLN M. KEEFE
BY J. A. Brian
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

Filed Aug. 29, 1950 19 Sheets-Sheet 2

FIG. 3




INVENTOR.
LINCOLN M. KEEFE

BY J. A. Geier

ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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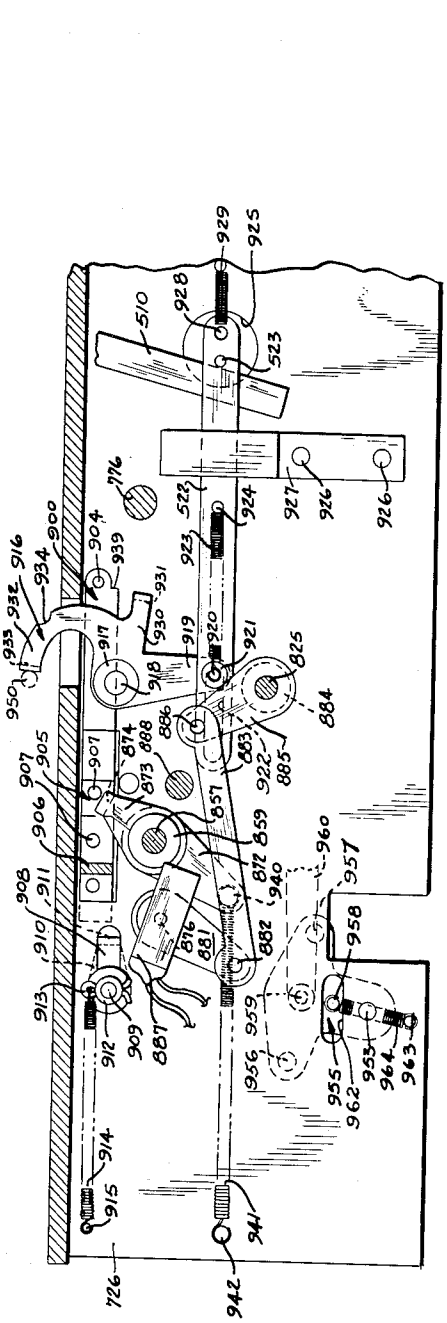


FIG. 36

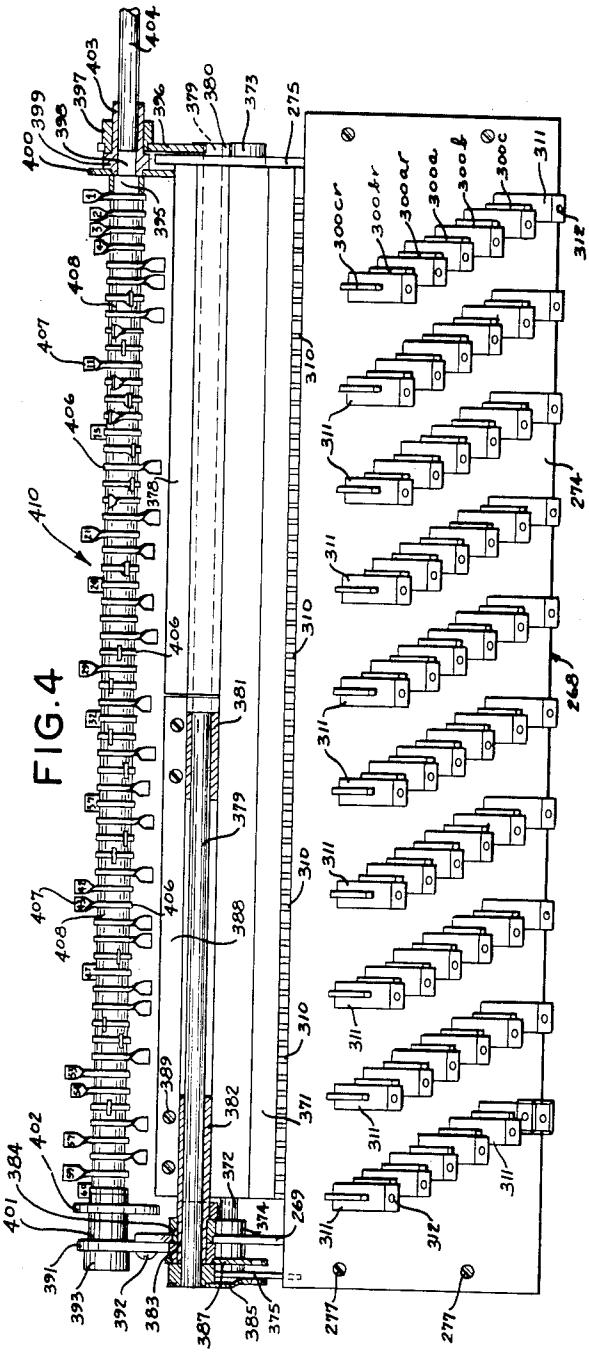


FIG. 4

INVENTOR.
LINCOLN M. KEEFE
BY J. A. Geier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG.5

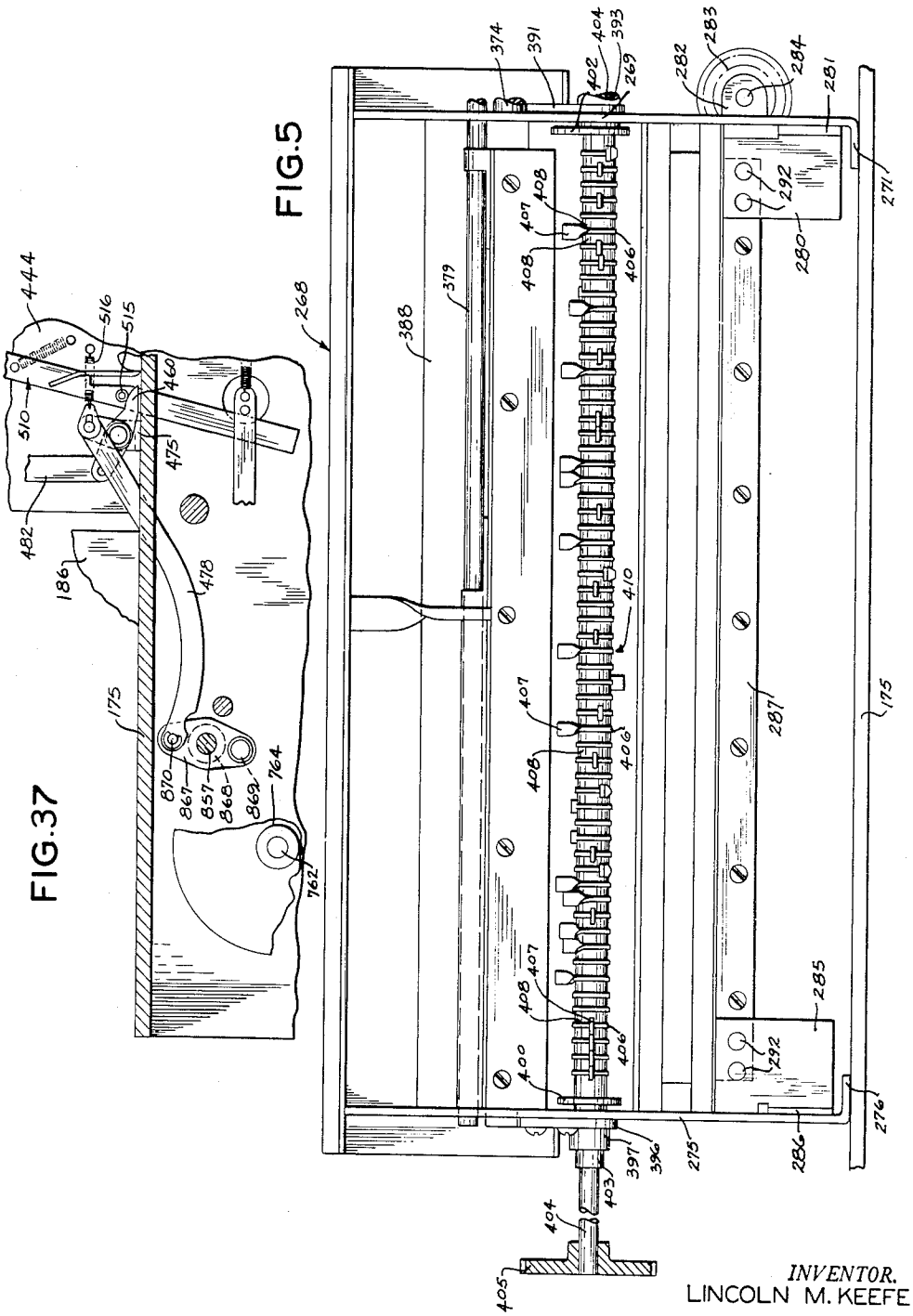



FIG.37

INVENTOR.
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 8

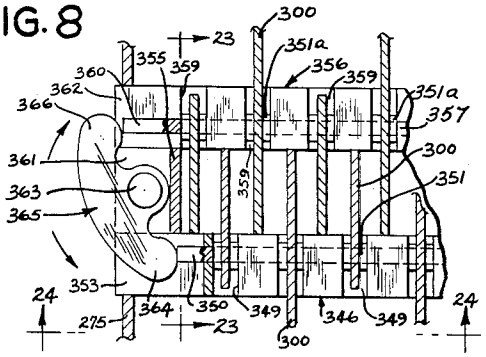
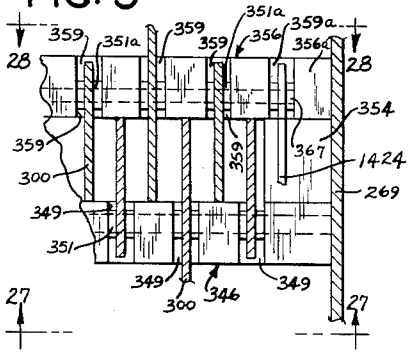



FIG. 9



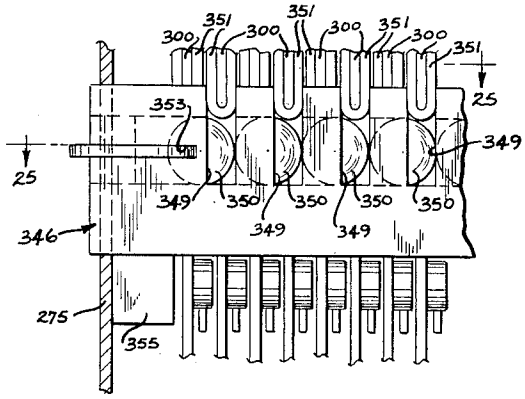




FIG. 7

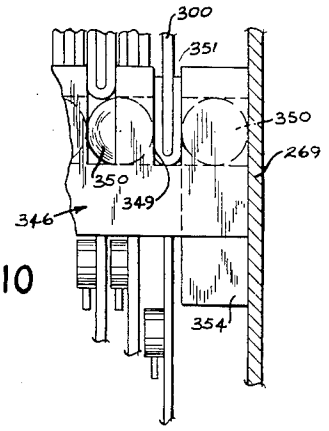



FIG. 10

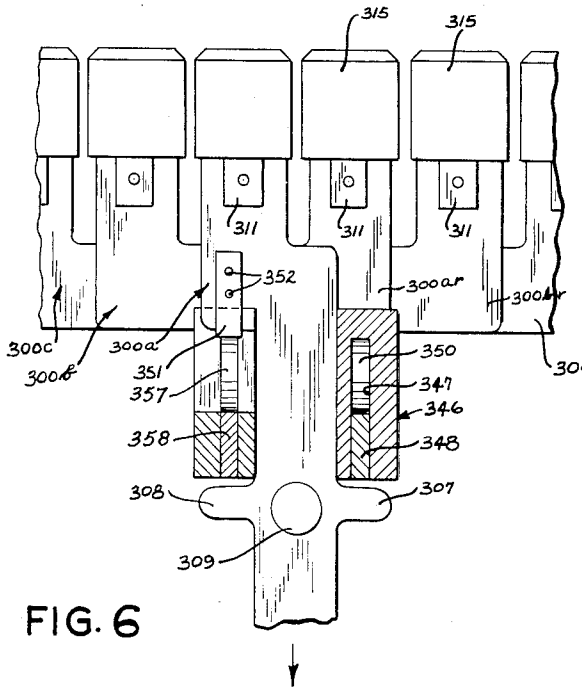



FIG. 6

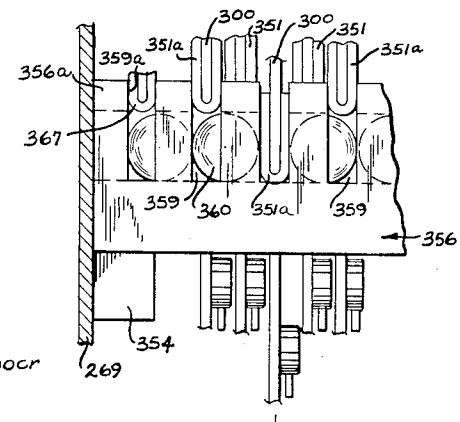



FIG. 11

*INVENTOR.*
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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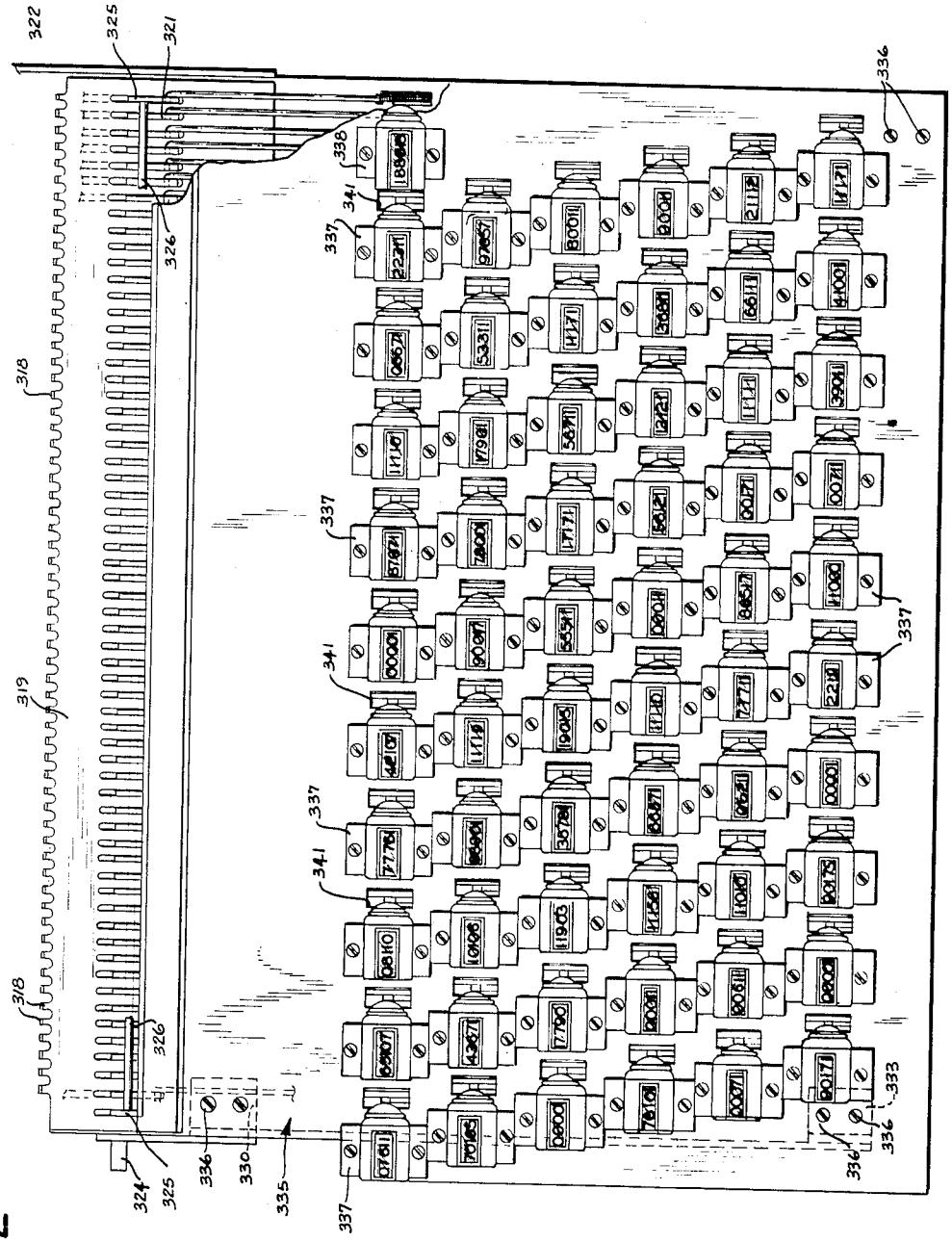



FIG. 12

INVENTOR.
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

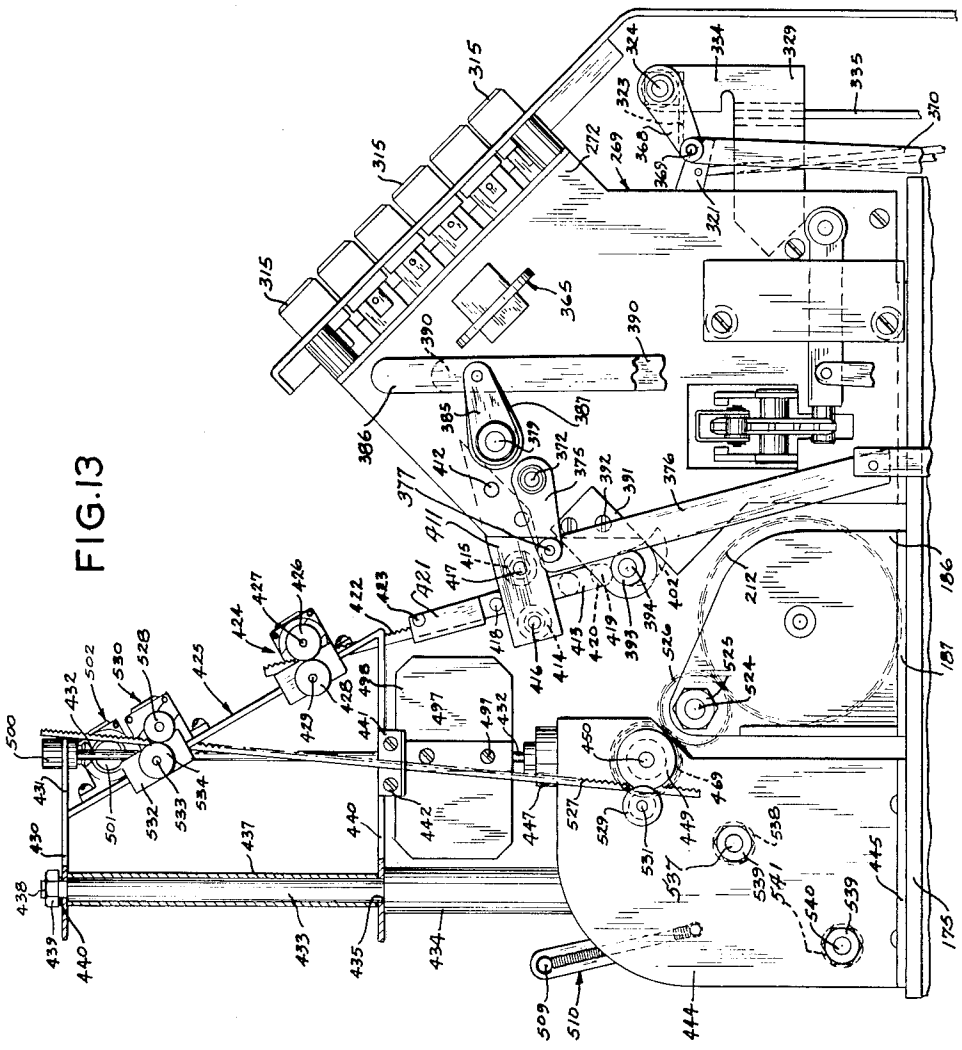
May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 13



INVENTOR.
LINCOLN M. KEEFE

BY J. A. Geier

ATTORNEY

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TICKET VENDING MACHINE

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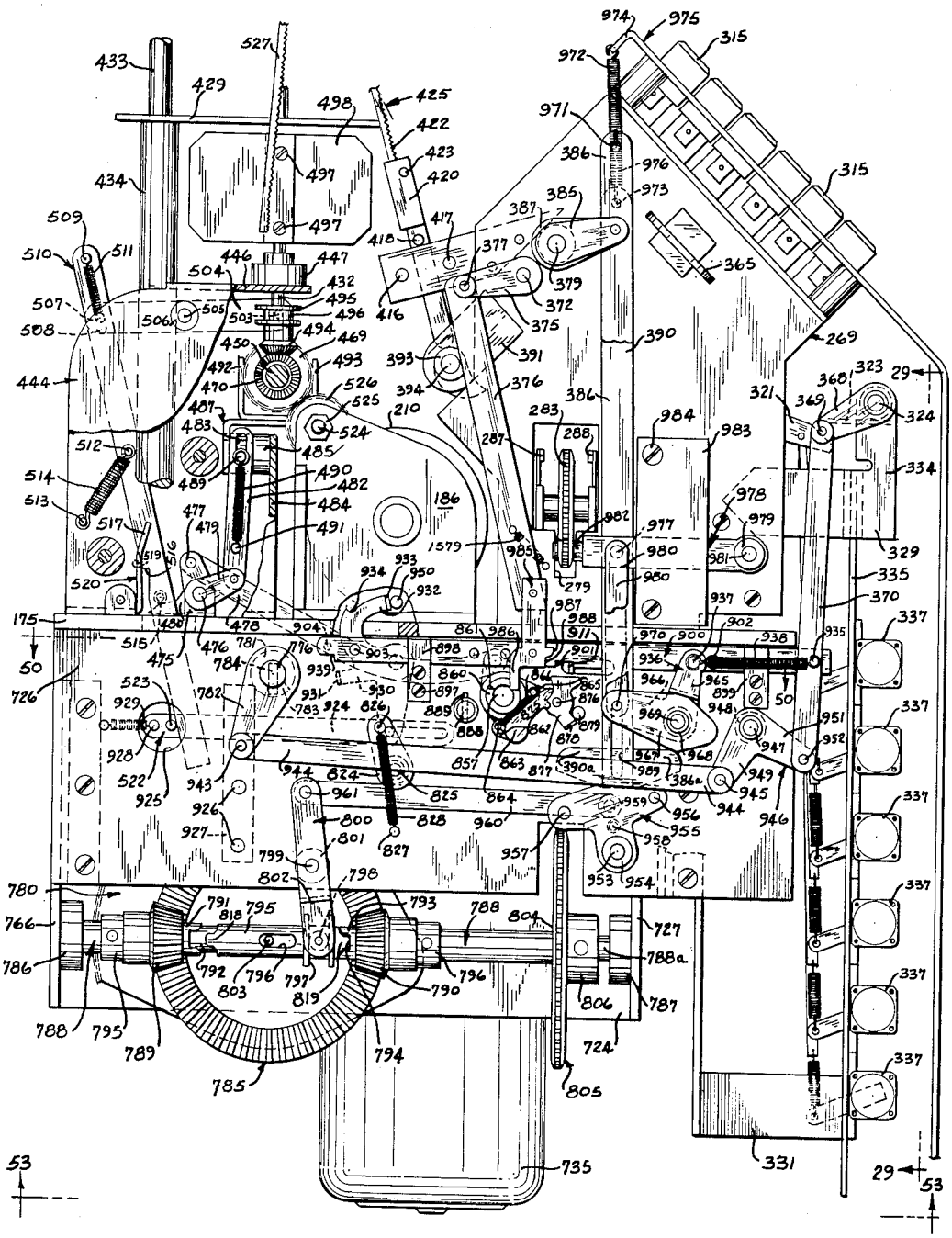


FIG. 14

INVENTOR.
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG.15

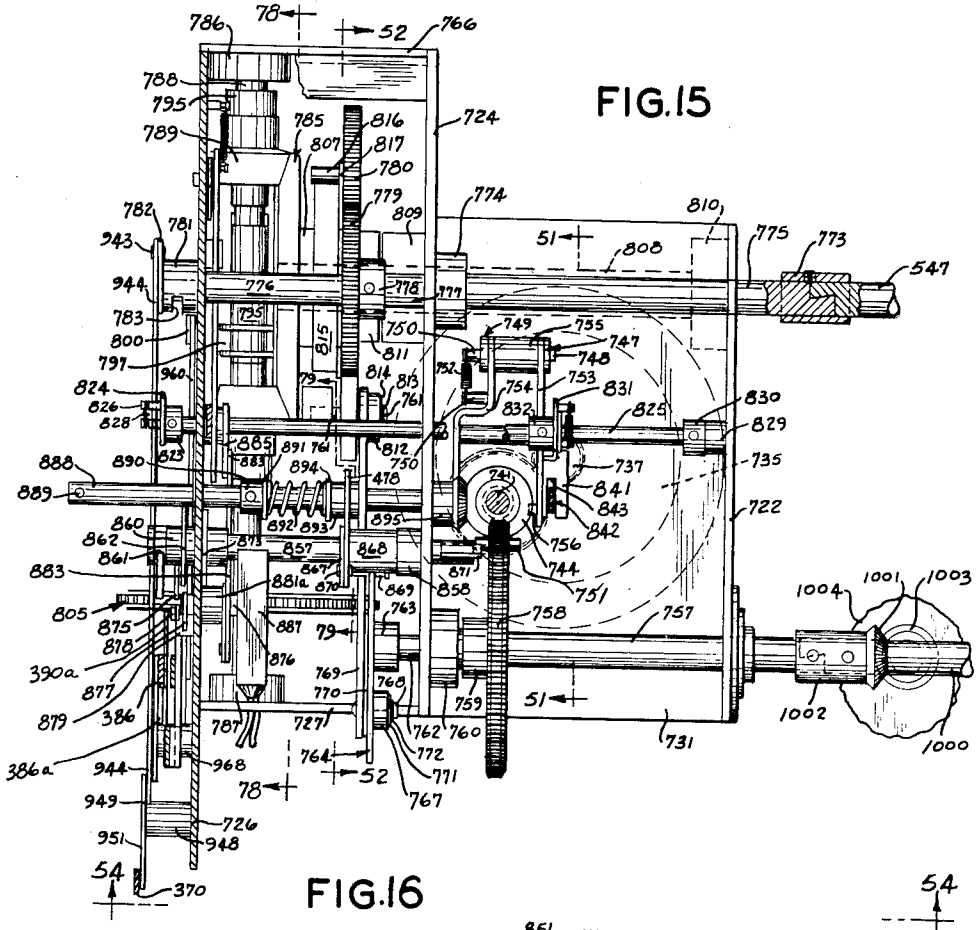


FIG.16

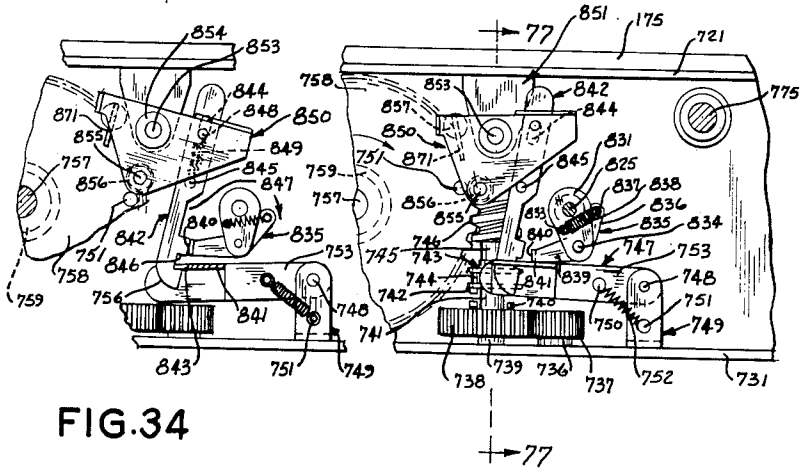


FIG.34

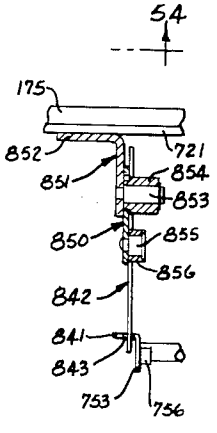


FIG.35

INVENTOR.
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

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TICKET VENDING MACHINE

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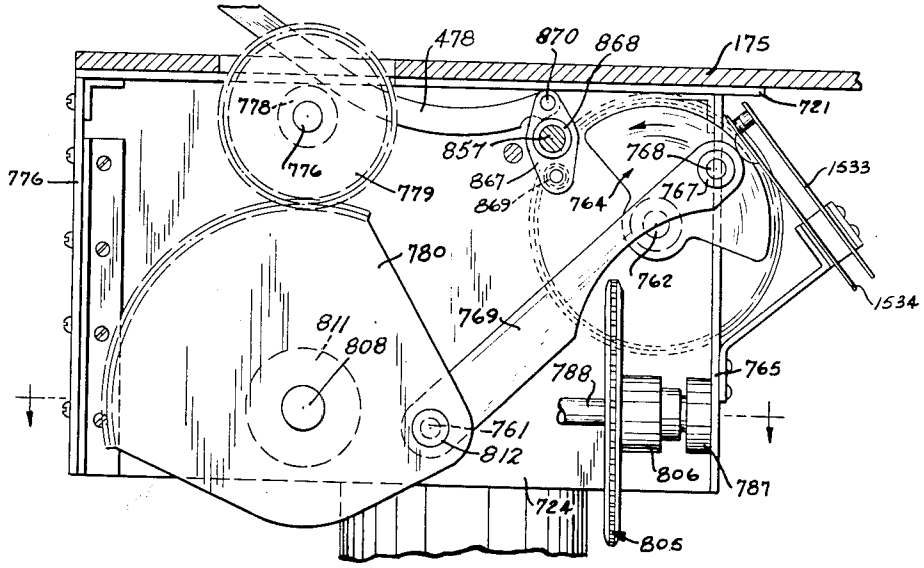



FIG.17

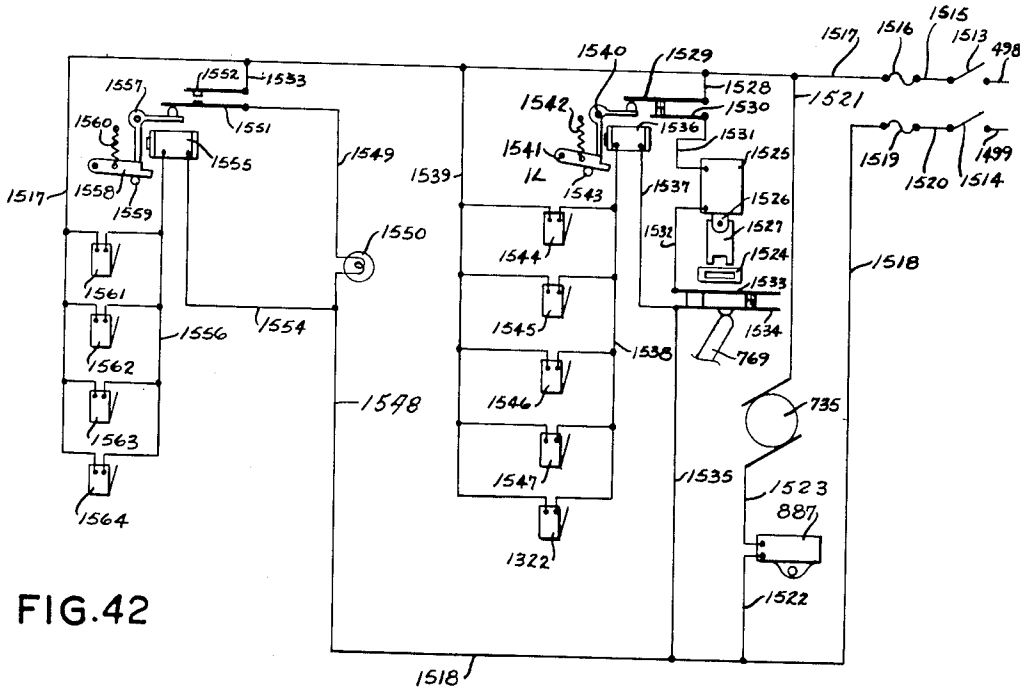



FIG.42

*INVENTOR.*
LINCOLN M. KEEFE

BY J. A. Geier

ATTORNEY

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TICKET VENDING MACHINE

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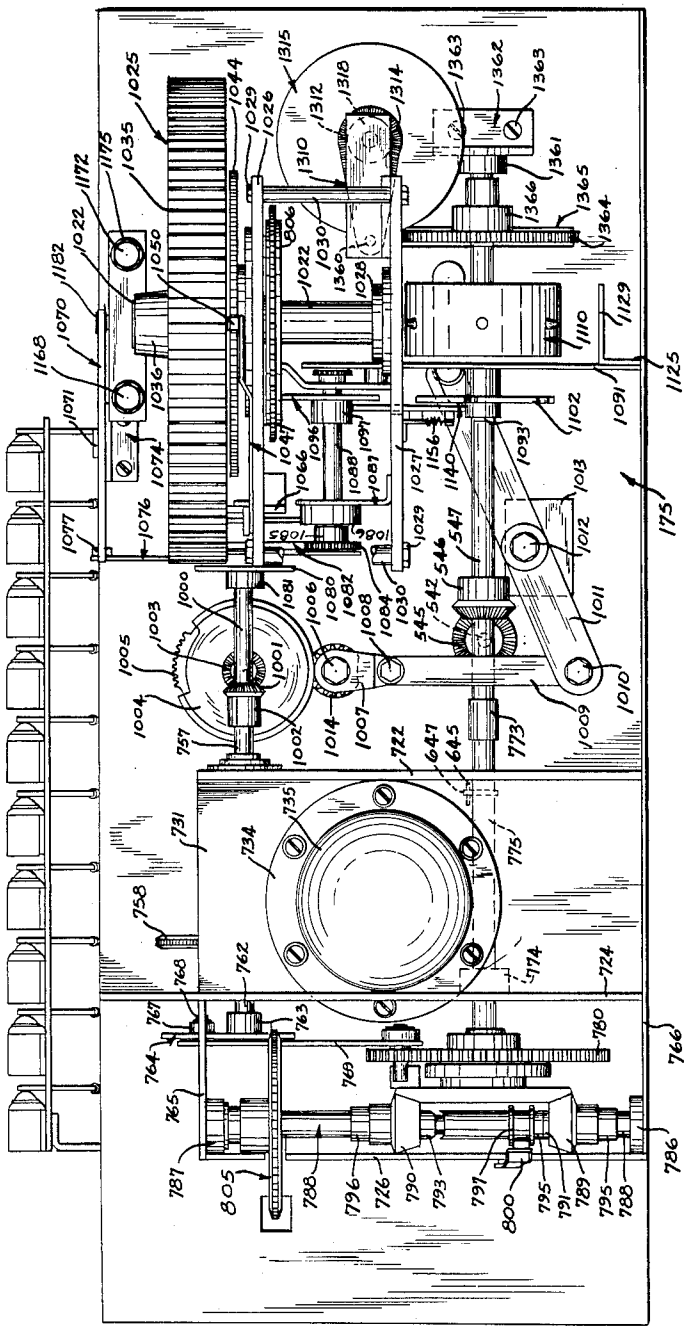


FIG. 18

*INVENTOR.*
LINCOLN M. KEEFE
BY J. A. Grier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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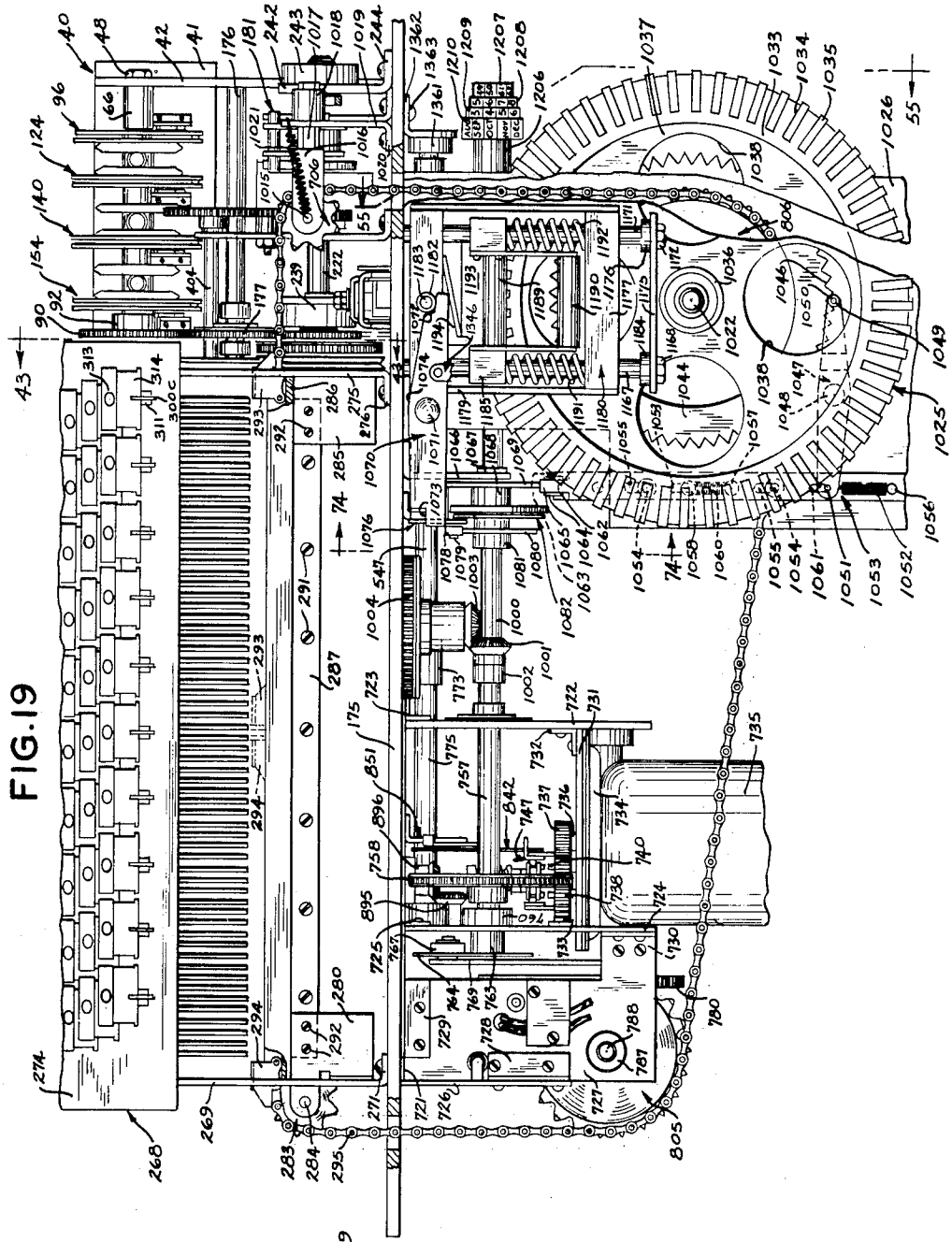


FIG. 19

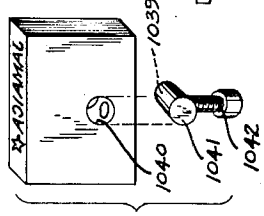


FIG. 38

INVENTOR.
LINCOLN M. KEEFE
BY J. A. Geier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG.21

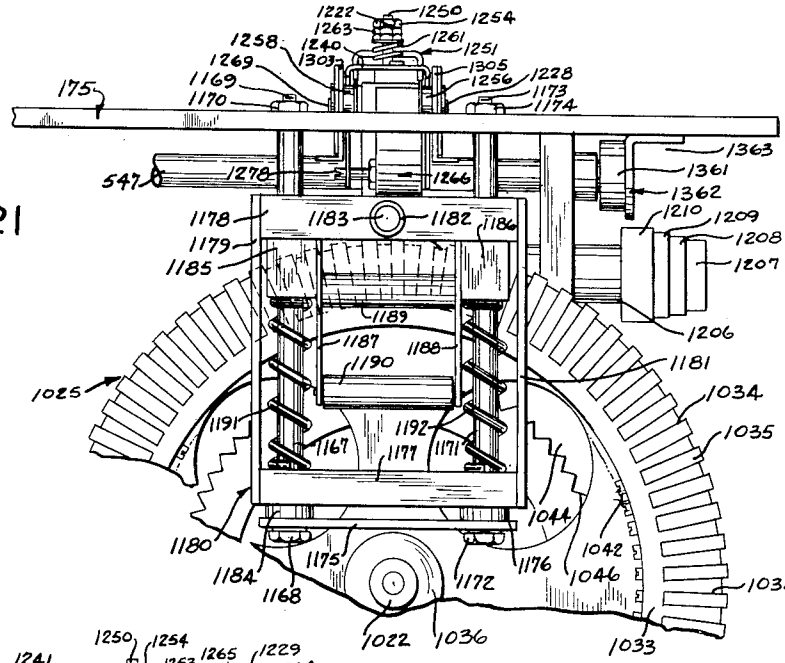
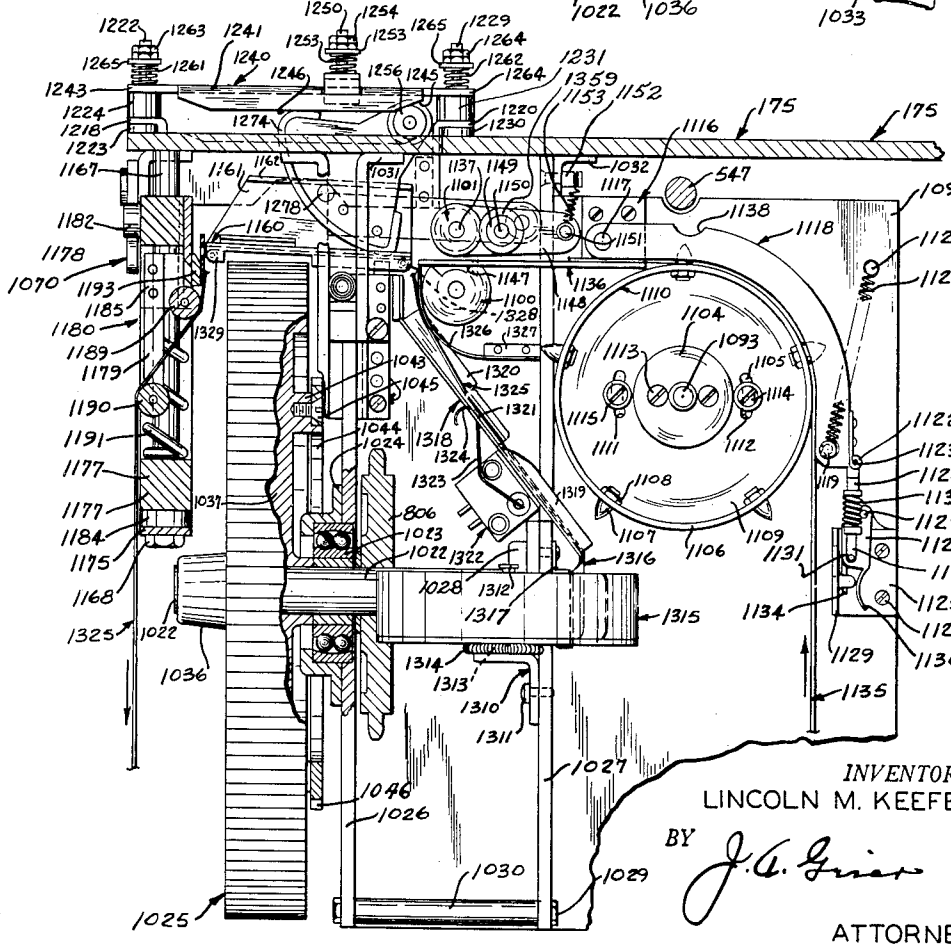


FIG.20



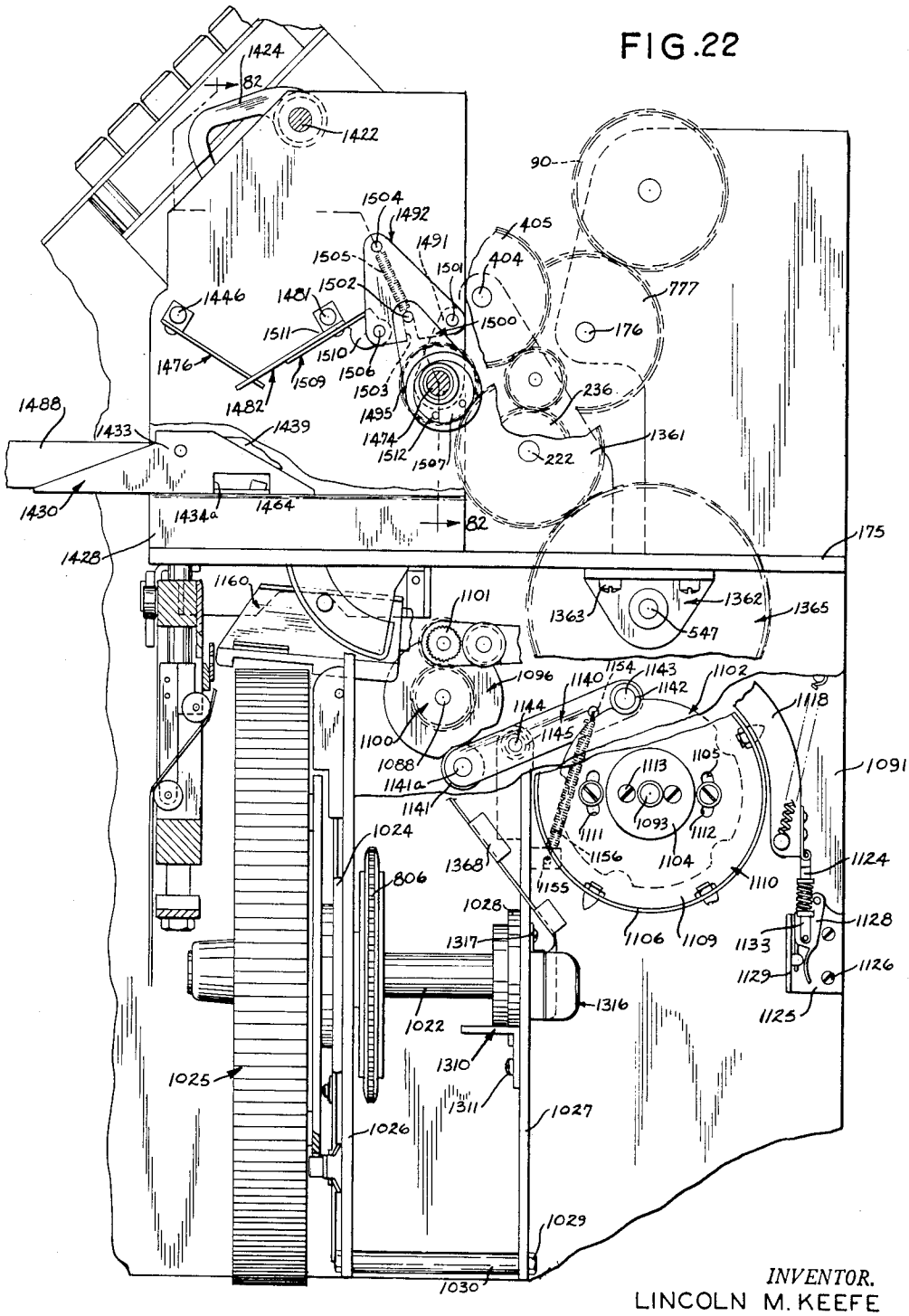
INVENTOR.
LINCOLN M. KEEFE
BY J. A. Grier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 22




*INVENTOR.*
LINCOLN M. KEEFE

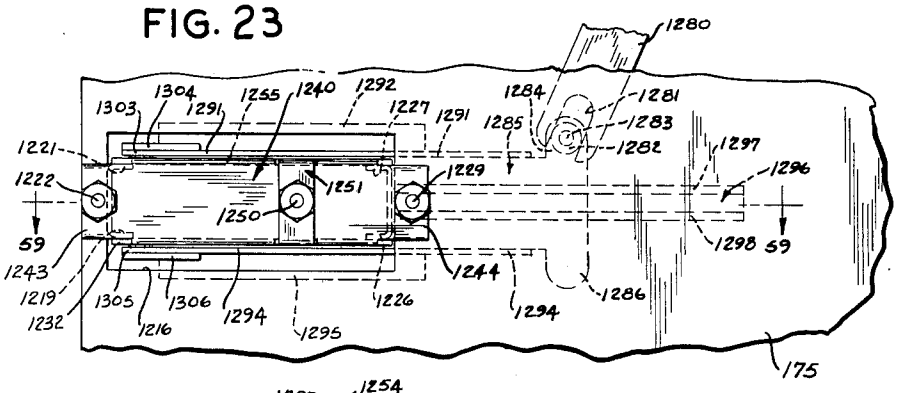
*BY*
J. A. Grier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 23



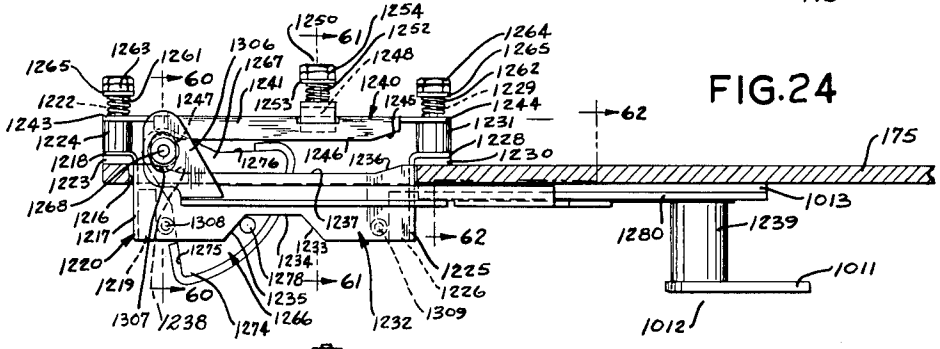




FIG. 24

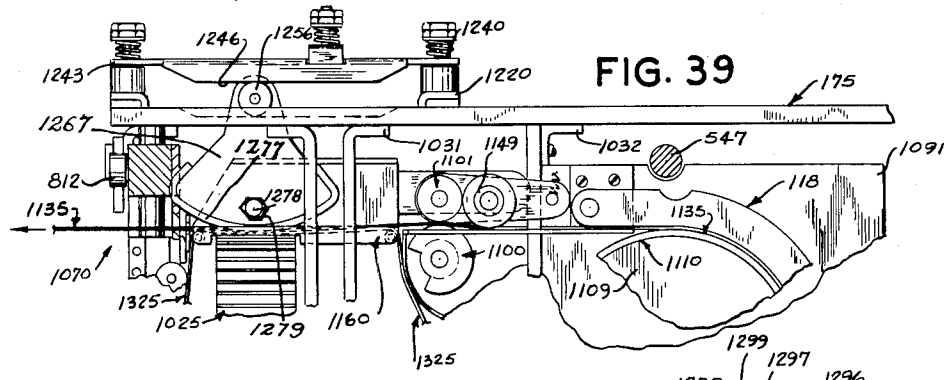



FIG. 39

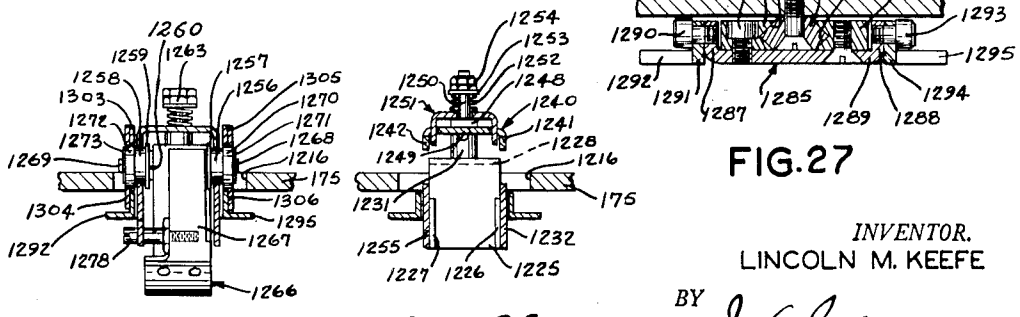



FIG. 27




FIG. 25




FIG. 26

INVENTOR.
LINCOLN M. KEEFE

BY J. A. Grier

ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 28

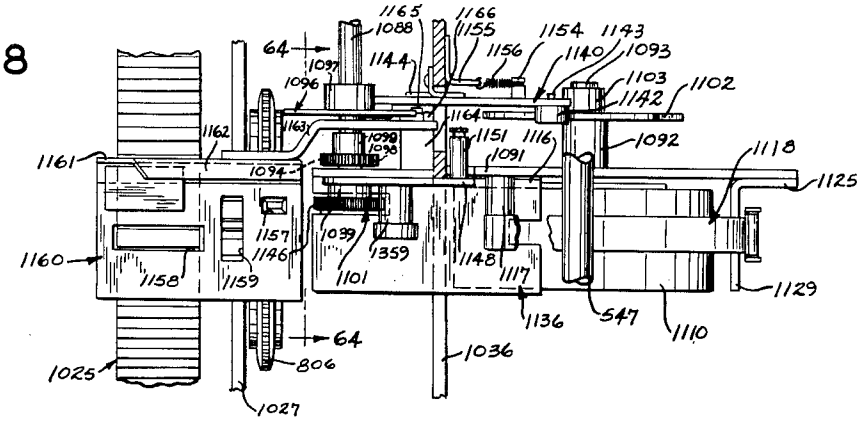



FIG. 30

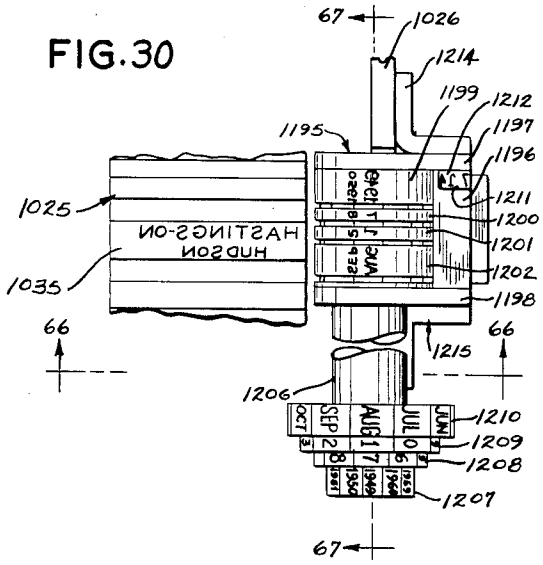



FIG. 29

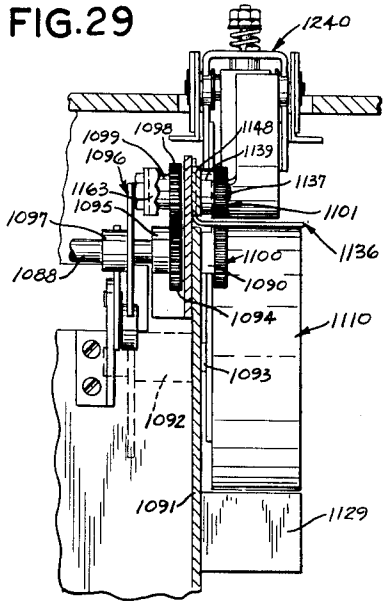



FIG. 31

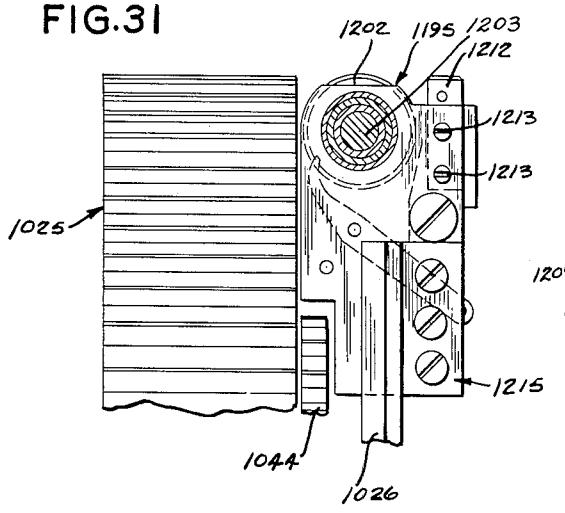
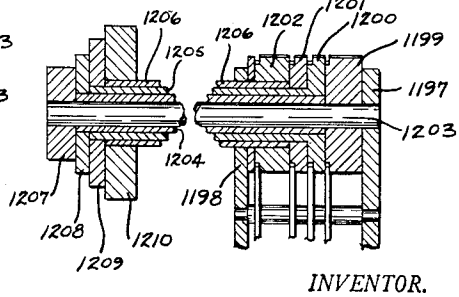



FIG. 32




INVENTOR.
LINCOLN M. KEEFE
BY J. A. Greiner
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May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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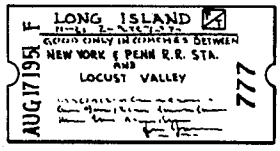



FIG. 45

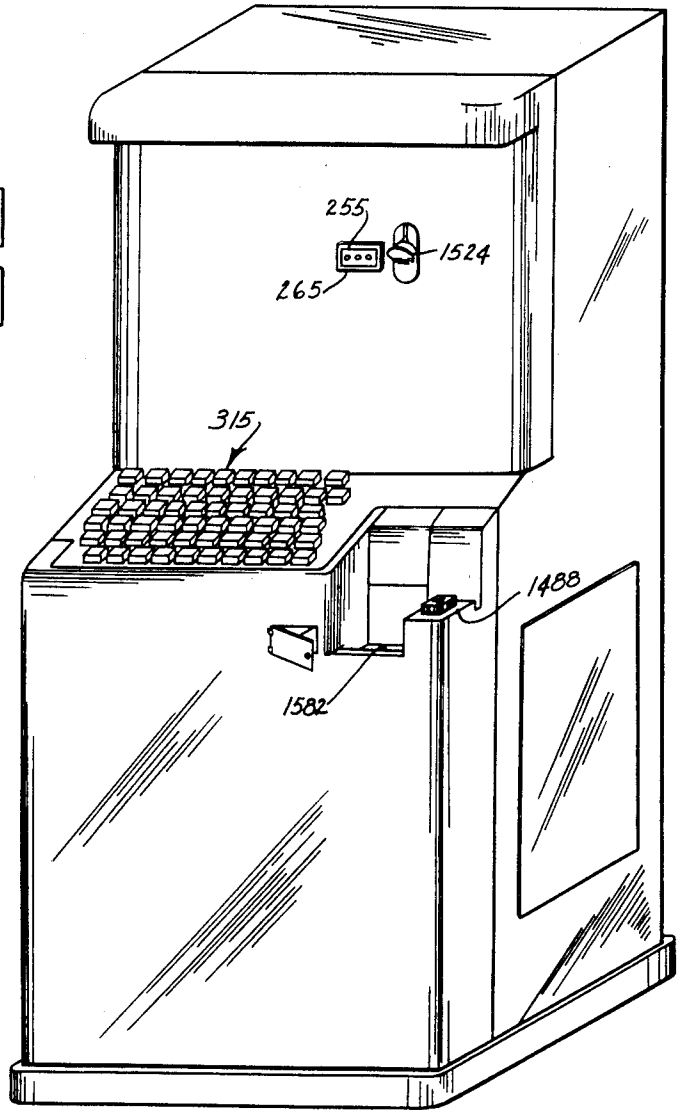



FIG. 44

Inventor

LINCOLN M. KEEFE

By J. A. Greer

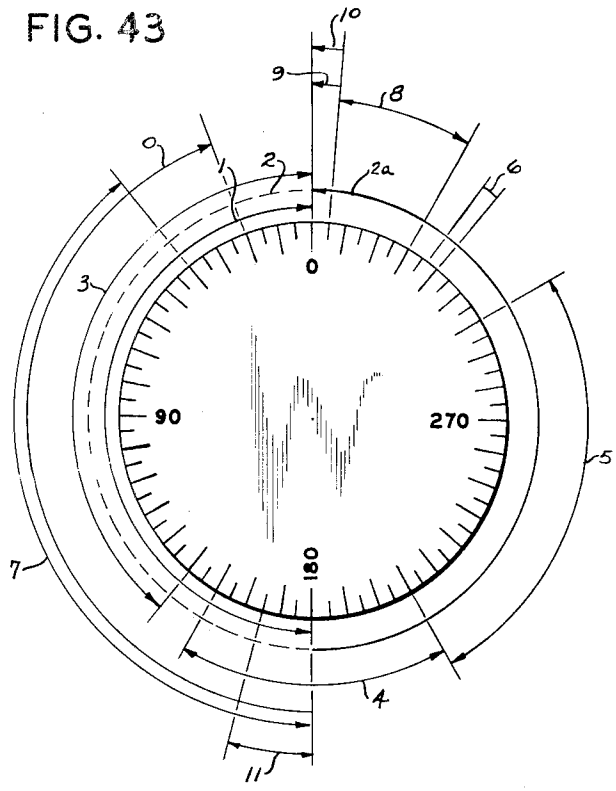
Attorney

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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FIG. 43




*INVENTOR.*
LINCOLN M. KEEFE
*BY* J. A. Grier
ATTORNEY

May 8, 1956 L. M. KEEFE 2,744,463

TICKET VENDING MACHINE

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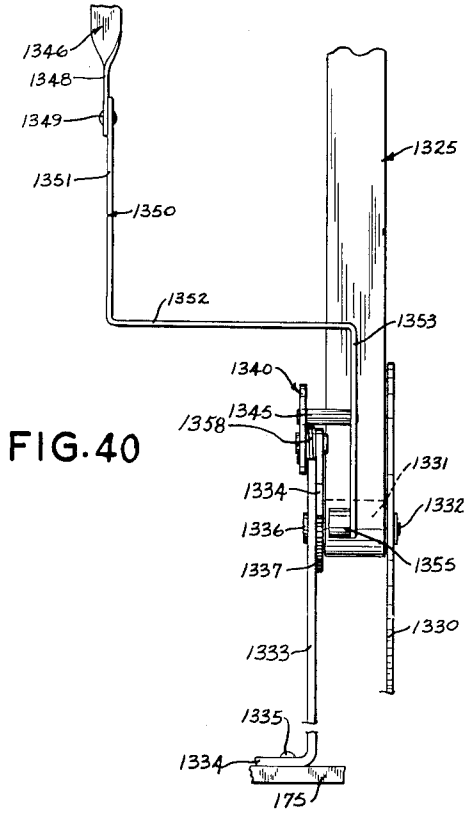



FIG. 40

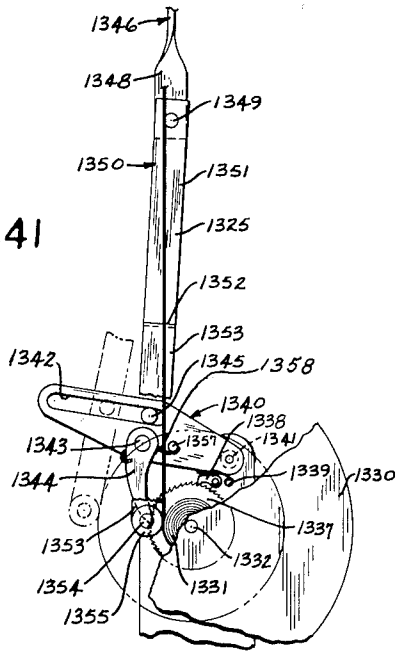
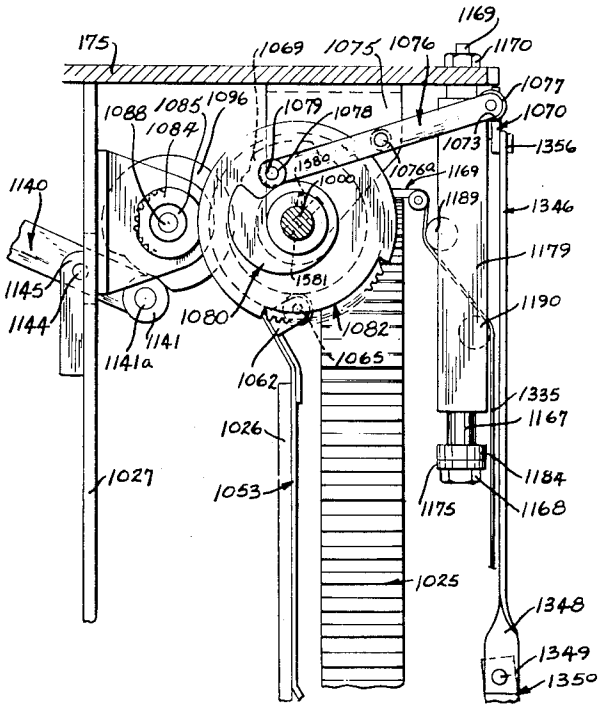



FIG. 41

FIG. 33




*INVENTOR.*
LINCOLN M. KEEFE
BY J. E. Greer
ATTORNEY

United States Patent Office

2,744,463

Patented May 8, 1956



2,744,463

# TICKET VENDING MACHINE

Lincoln M. Keefe, Woodside, N. Y., assignor to Richard I. N. Weingart, Long Island City, N. Y.

Application August 29, 1950, Serial No. 182,031

17 Claims. (Cl. 101—67)

This invention relates to improvements in vending machines and has for an object the provision, in a vending machine, of a coin counter which accepts one or more coins of different denominations, integrates the values of the coins accepted and sets up a credit in the machine representing the total value of the coins.

Still another object of the invention is the provision in a transportation ticket vending machine of a group of selector keys, each representing a different destination, a plurality of locks normally preventing said keys from being depressed, means for progressively unlocking said keys and ticket issuing means for issuing a ticket having a representation of the destination selected by the depression of a desired selector key.

A further object of the invention is the provision, in a ticket issuing machine, of a support carrying a plurality of lines of type, of different designations, a printing stage a web of ticket material and means to intermittently advance the same along a path through said stage, selector means including settable push buttons, each corresponding to a different designation, for effecting the positioning of a line of type of a selected designation in registration with said web, means in said machine for printing on said web with the selected line of type, and cutting means for severing the printed portion of said web from the remainder and issuing the same as a ticket.

Another object of the invention is the provision, in a ticket issuing machine, of a bank of selector buttons in cooperation with the latter, a wheel-like member arrested by any of said buttons with a corresponding line of type in printing position, a series of tickets in the form of a strip intermittently moved in a path crossing said printing position, means for effecting a printing operation after the arrest of said wheel-like member, and cutting means for thereafter cutting off a portion of said strip which was printed on and delivering the same outside said machine.

Other objects and advantages of the invention will be apparent to those skilled in the art from a study of this specification and the accompanying drawings.

Referring to the drawings, which are given by way of example to illustrate the invention:

Figure 1 is an elevation, partly in section, showing the relation between a bank of selector keys and the locking means and also showing a bank of counters and means carried by the selector keys for actuating said counters;

Figure 2 is a view similar to Figure 1 except that one of the keys of the bank has been depressed, and its plunger end extends into the cut-out portion of one of the locking drum discs;

Figure 3 is a front elevation showing a bank of selector keys, the supports therefor, and a control member for the ticket printing mechanism which is arrested by a depressed key;

Figure 4 is a plan view of the key bank shown in Figure 3 which also shows certain bails and which also shows



one of the elements for determining the number of pennies to be given in change;

Figure 5 is a rear elevation of the key bank shown in Figures 3 and 4;

Figure 6 is a view showing the key bank of Figure 1 enlarged and showing a cross-section of the lockout chain;

Figure 7 is a fragmentary view of the lockout chain at one end of the key bank showing in elevation a locking member connecting the portion of the lockout chain on one side of the key stems to the portion of the lockout chain on the other side of the key stems;

Figure 8 is a view, partly in section, taken along the line **8—8** of Figure 7;

Figure 9 is a view similar to Figure 8, except that it shows the opposite or barrier end of the lockout chain;

Figure 10 is an elevation taken along the line **10—10** of Figure 9;

Figure 11 is an elevation, taken along the line **28—28** of Figure 9;

Figure 12 is a front elevation of the counter panel for indicating the numbers of tickets sold to each destination and the total tickets sold and showing means for actuating the counters thereon;

Figure 13 is a left end elevation showing the relation of several cooperating elements of the machine;

Figure 14 is an elevational view similar to Figure 13, except that a control section is provided below the main supporting plate, and interconnection between various elements are shown;

Figure 15 is a view of the control section as seen along the line **15—15** of Figure 14;

Figure 16 is a view taken along the line **16—16** of Figure 15;

Figure 17 is an elevation taken along the line **17—17** of Figure 15;

Figure 18 is a view taken below the main support plate looking upwardly and showing the bottom of the control section and mechanism extending therefrom to the ticket printing mechanism and to other elements of the machine;

Figure 19 is a front elevation of the machine showing mechanism for setting the printing wheel to print a station name corresponding to the name on the key selected;

Figure 20 is a right side elevation of the printing mechanism taken along the line **20—20** of Figure 19;

Figure 21 is a fragmentary view of the upper portion of the printing wheel and showing the knife for severing a printed ticket from a strip;

Figure 22 is an elevation, partly broken away, and showing mechanism for feeding tickets to the printing wheel and other details;

Figure 23 is a plan view of the mechanism for effecting printing operations;

Figure 24 is an elevation, partly in section, taken along the line **24—24** of Figure 23;

Figure 25 is a sectional elevation taken along the line **25—25** of Figure 24;

Figure 26 is a sectional elevation taken along the line **26—26** of Figure 24;

Figure 27 is a sectional elevation taken along the line **27—27** of Figure 24;

Figure 28 is a plan view showing other details of the ticket feed and the relation between the station name, the date, and code character;

Figure 29 is an elevation, partly in section, taken along the line **29—29** of Figure 28;

Figure 30 is a plan view of the registered type of the printing wheel and its relation to the date printer;

Figure 31 is a fragmentary view taken along the line **31—31** of Figure 30;

Figure 32 is a sectional elevation taken along the line **32—32** of Figure 30;

Figure 33 is a detail view of the sheer actuator;

Figure 34 is a view similar to Figure 16, showing some of the elements in other positions to illustrate a certain action;

Figure 35 is a sectional elevation taken along the line 35—35 in Figure 16;

Figure 36 is an elevation taken along the line 36—36 in Figure 15;

Figure 37 is a fragmentary view taken along the line 37—37 of Figure 16;

Figure 38 is an exploded view showing one method of detachably securing the type slugs in the printing wheel;

Figure 39 is a view showing the path of the ticket stock past the printing elements and through the shearing means;

Figure 40 is a view of the carbon paper strip feed;

Figure 41 is a side elevation of the carbon paper strip feed;

Figure 42 is a circuit diagram of the electrical circuits in the machine;

Figure 43 is a polar diagram showing the various actions occurring in the machine during different phases of the machine cycle;

Figure 44 is a perspective view of the machine showing the location of the selector keys, the coin return, the cup into which the ticket and change or the returned money is deposited, and showing the coin slot and the device indicating the amount of money accepted by the machine; and

Figure 45 is a view of a ticket made by my device.

## SELECTOR KEY BANK

The selector key bank **268** forms a unitary structure which may be bodily assembled into or removed from the machine. This structure is shown in Figures 3, 4 and 5. In Figure 19, its relation to other elements of the machine is shown, as seen from the front. In Figures 13 and 14, end elevations of this structure and its relation to other elements of the machine may be seen, while sectional elevations Figures 1 and 2 show the relation between the selector keys, the discs of the locking drum and other features.

The selector key bank **268** has a left vertical end plate **269** with an inturned foot portion **271**. The upper end **272** of this end plate is angular with respect to the vertical axis, as the keyboard is to be inclined, and an inturned flange **273** thereon has secured thereto by means of screws, a top plate **274** through which the key stems, to be presently described, extend.

A second or right vertical end plate **275** has an inturned foot portion **276** adapted to be secured to the main base plate **175**. The upper end of this end plate is also angular and has an inturned flange **277** to which the top plate **274** is secured by means of screws.

The end plates **269** and **275** have aligned rectangular holes **278** and rectangular holes **279** communicating therewith (Figure 1). A block member **280** has flanges **281** secured to the end plate **269** and a projection thereof **282** extends through the rectangular hole **278**. This projection is slotted to accommodate a sprocket **283** and this sprocket is journaled on a shaft **284** positioned in aligned holes in the slotted projection. A block member **285** has flanges **286** secured to the end plate **275** and has a central slot therein. A chain support channel **286** extends from a point, where it clears the sprocket **283**, adjacent to end plate **269**, to contact the other end plate **275**. Along each edge of the channel **286** are overhanging flanged rails **287** and **288**, which are secured to the flanges **289** and **290** of the channel, respectively, by means of screws **291**. The channel **286** is secured to the blocks **280** and **285** by means of screws **292**. The purpose of the channel **286** with the overhanging rails is to provide a positive track for a chain **295** carrying a right hand engaging member **293** and a left hand engaging member **294**, the functions of which will be explained herein.

A pair of opposed channels **296** and **297** are secured to the end plates **269** and **275** and have the adjacent faces of their main webs in spaced parallel relation and the axis of the space between them is 90° with respect to the plane of the top plate **274**. The main webs have a plurality of aligned slots **298** and **299**, respectively, therein.

A plurality of key stems **300** are reciprocally carried between the channels **296** and **297** as follows: Each key stem has a lateral tab **301** which extends into a different slot **298** in the channel **296**. Each key stem also has a like lateral tab **302**, in alignment with the tab **301** and extending in the opposite direction and into a slot **299** in the channel **297**. The extremity of the tab **301** has a right angled portion **303** and an angular portion **304**. The extremity of the tab **302** has corresponding portions **305** and **306**.

The key stems also have aligned oppositely extending lateral tabs **307** and **308** which are spaced apart, lengthwise of the stem, from the tabs **301** and **302**. Secured to the stem **300** between the tabs **307** and **308** is a stud **309** which actuates a lever **310** when the key on said lever is depressed. Since there are six selector keys in each group, and 10 groups making a total of 60 selections, the key stems per se are made with the two pairs of opposed tabs and are consequently reversible. Now, with six keys in each group and with the stems reversible, it is only necessary to make three forms of keys to make up the entire keyboard. In Figure 2 the key stem **300** has an offset extension **300***a*, which has the smallest amount of offset. Now take one with the same amount of offset and turn it over, and it assumes the position **300***ar* (**300***a* reversed). The next greater amount of offset is shown in Figure 2 at **300**b. Now, when a key like **300***b* is turned over, it assumes the position **300***br* (**300***b* reversed). At **300***c* the greatest amount of offset for the extension is shown, and when a key like this is turned over, it assumes the position **300***cr* (**300***c* reversed).

Secured on each key, for example by riveting or welding, is a stem **311**, and each stem carries a tapped hole **312** (as seen in Figure 3). Secured on each stem by means of a screw **313** engaging tapped hole **312**, is a stamped hollow rectangular springy member **314**, as seen in Figure 19. Mounted on each member **314** is a hollow rectangular button member **315**, Figures 1 and 2, bearing the name of the station to which the key corresponds.

Returning to the levers **310**, Figure 1, these are really bell-cranks, each having an arm **316** held in contact with the stud **309** of its associated key stem **300** by means of a spring **317**, one end of which is connected to the arm **316** and the other end of which is connected to a serration on the serrated edge **318** of a guide member **319**. The levers **310** are all journaled on a shaft **320** supported in the guide member. Each lever has a second arm **321**, and all of these arms extend through a different one of a series of vertical slots **322** in the guide member **319**. At the extremities, each of the levers **321** is beveled and they are all normally disposed along a line adjacent to the edge of a bail **323** carried on a bail shaft **324**. Each lever is provided with a hole near its beveled end, the function of which will be presently described.

The guide member **319** is secured to and supported by the end plates **269** and **275**.

A lever **325** has a bearing hole in one end which is journaled on the shaft **320** at one end of the array of bell cranks **310** and a second like lever **325** has a hole therein journaled on the shaft **320** at the other end of the array of bell cranks **310**. The two levers **325** have aligned holes therein near the other ends thereof, and secured in these holes, and thereby tying the levers together, is a rod **326** which rests on the upper surfaces of all of the arms **321** of the bell cranks, so that as any arm in said array is raised, it in turn raises the rod **326** and the levers **325** supporting it, and the function of this will presently be explained.

## COUNTER PANEL

Depending from the left end plate **269**, Figure 1, is an angle iron support **327**, and secured thereto by means of screws such as screws **328** is a bracket member **329** having a right angled tab **330**. Secured to the lower end of the support **327** is a U-shaped bracket **331** having legs **332** and **333**. The leg **332** is secured to this support **327** by means of screws **328**. An extension **334** of the bracket **329** carries a bearing (not shown) in which the bail shaft **324** is journaled. The right end plate has a depending angle iron support like **327**, and this support carries members like **329** and **331** and also an extension like **334**, in which the other end of the bail shaft **324** is journaled.

A panel **335**, Figure 12, is secured to these tabs and legs by means of screws **336**. This panel has mounted thereon sixty counters **337** arranged ten in each of six rows, each row being displaced with respect to its neighbor. Since the machine has 60 keys, each representing a different destination, I provide one counter **337** for each destination, so that at any time the number of tickets sold for each specific station can be read off. Another counter **338** is also provided for counting the total of all tickets sold for any and all destinations. Each one of the counters **337** is provided with an actuating lever **339**, and although the lever on the total counter **338** is like the others, it is designated by the numeral **340** to simplify this explanation. Adjacent to each lever, the panel has a rectangular hole **341** therein, through which the lever extends.

Referring also to Figure 1, the arm **325** has a hole therein to which one end of a pull rod **342** is connected. The other end of the pull rod is connected to one end of a spring **343** and the lower end of the spring is connected to a suitable hole near the outer end of the lever **340**. Whenever any key **315** is depressed to select the destination, the lever **321** corresponding to the key raises the rod **326** and consequently the levers **325**. This causes the pull rod to pull the counter lever **340** to move upwardly, thereby actuating the total counter **338**. In case the lever **340** gets stuck or too hard to move, the spring **343** will stretch and prevent breakage or other damage.

Each of the other counters **337** is connected to a different lever **321** by means of a similar pull-rod-spring arrangement. As seen, for example, in Figure 1, the lever **339** of each counter is connected to its corresponding lever **321** by means of a pull rod **344** and a spring **345** in series therewith.

## LOCKOUT CHAIN

In most vending and dispensing devices where the vendee selects by means of keys or other means, some form of "lockout chain" is provided to prevent another key or other selector from affecting the machine in any way after a selection has already been made. My lockout out chain is shown in Figures 1, 2, and 8 to 11 inclusive. Referring to said figures, a bar **346** has a longitudinal slot **347** formed therein, and a member **348** forming a closure for the slot, defines a passage in which a plurality of discs **350** are positioned. A plurality of lateral slots **349** are formed in the bar **346**, each communicating with said passage. Each slot is in alignment with a plunger **351** on a different key stem **300**. Each plunger **351** is formed by securing a U-shaped metal member onto **300** by means of two escutcheon pins **352**. The end of the bar **346** has a horizontal slot **353** formed therein and communicating with the passage in the bar.

The end plate **269** has a metallic block **354** secured to its inner face, in any suitable manner, and the axis of block **354** is parallel to the axes of the key stems **300**. Secured to the opposite end plate **275** and in alignment with the block **354** is a similar block **355**. The bar **346** is secured to faces of the blocks **354** and **355** in any suitable manner, and it will be noted in Figure 26 that the edge of the last lateral slot **349** in the right end



thereof is exactly the diameter of a disc **350** from the adjacent surface of the end plate **269**.

A second bar **356** has a longitudinal slot **357** formed therein, and a member **358** forming a closure for the slot, defines a passage in which a plurality of discs **360** are positioned. A plurality of lateral slots **359** are formed in the bar **356**, each communicating with said passage. Each slot is in alignment with a plunger **351***a* on a different key stem **300**. These plungers are identical with the plungers **351** described above, except that they are oppositely disposed on their key stems and are in alignment with the slots **359** in the bar **356**.

One end of bar **356** is secured to the opposite face of the block **354**; and the other end is secured to the opposite face of the block **355**, so that one bar lies adjacent to the edges of the row of key stems **300**, and the other bar lies adjacent to the opposite edges of said row, as may be clearly seen in Figure 6. The end portion **356***a* of the bar **356**, between the last slot **359** and the end plate **269**, is left solid as seen in Figure 9 and it forms a solid barrier at one end of the chain. The barrier at the other end of the chain is the portion of the end plate **269** which abuts the right end of the bar **346**, also seen in Figure 9.

The horizontal slot **353** in the bar **346**, coincides with a corresponding slot **361** in the block **355**, Figures 7 and 8, and a corresponding slot **362** in the bar **356** matches the slot **361**, so that collectively they form a continuous passage. The block **355** has a vertical hole therein to accommodate a shaft **363** upon which a link member **365** is journaled. The link member has a rounded lobe **364** which contacts the left end disc **350** in the channel in bar **346** and a rounded lobe **366** which contacts the left end disc **360** in the channel in bar **356**, thus the link member connects the two series of discs in their respective channels to form the lockout chain. The relation of the discs **350**, the link member **365** and the discs **360** is such that when one plunger **351**, or one plunger **351***a*, enters between adjacent discs **350**, or between adjacent discs **360**, it is impossible for any other plunger to enter between the discs in either bar.

Referring to Figures 1 to 4, and 13, the bail shaft **324** has secured on its outer end a crank arm **368** which is pivotally connected, as seen in Figure 13, by means of a clevis pin **369** to a bar **370**, which is in turn connected to control mechanism to be presently described.

A bail **371** is carried on a bail shaft **372** which is journaled in bearings **373**, in end plate **275**, and **374** in end plate **269**. The shaft **372** extends through the bearing **374** and has secured thereon a crank arm **375** (Figure 4). The crank arm is pivotally connected to a bar **376** by means of a clevis pin **377** (Figure 13). The bail **371** functions to swing above the lateral tab **301** of a depressed key to prevent it from returning to its normal position until the end of a machine cycle.

A bail **378** has a shaft **379**, one end of which is journaled in a bushing **380** in the end plate **275**, and the other end is journaled in a sleeve **381** and a second sleeve **382** (Figure 4). The sleeve **382** is stepped and has a portion **383** journaled in a bushing **384** fixed in the end plate **269**. The shaft **379** extends beyond the left end of the sleeve **382** and has secured thereon a crank arm **385** to which a bar **386** is pivotally connected as shown in Figures 13 and 14. The sleeve portion **383** projects beyond the left end of the bushing **374** and has, secured at its outer end, a crank arm **387**.

A bail **388** is secured to the sleeve **381** and to the sleeve **392** by means of screws **389**, and normally the bails **378** and **388** are in alignment as seen in Figure 1. The crank arm **387** has pivotally connected to it a bar **390**.

In the embodiment of the invention herein disclosed, it has been described that the machine prints and delivers tickets for sixty different destinations. This means that a printing wheel (to be presently described) carries sixty different type set-ups and this printing wheel is rotated,

in accordance with the selection made, to bring the type set-up of the destination selected into registration with the ticket, so that printing may be effected during the operating cycle of the machine. Now, since the printing wheel is of considerable weight, it is desirable to move it the least distance possible in order to avoid excessive momentum. For this reason the control mechanism, to be presently described, is so arranged that when any key **315** in the first group of thirty keys, controlled by the bail **378**, is depressed, the printing wheel (which is moved by the chain **295**) rotates in one direction; and when any key in the second group of thirty (thirty-one through sixty) controlled by the bail **388**, is depressed, the printing wheel rotates in the opposite direction. This means that the rotation of the printing is from a few degrees to a maximum of about one-half revolution.

Secured to the end plate (Figures 4 and 13) is a plate member **391** in any suitable manner, as, for example, by means of screws **392**. The plate member carries a bearing bushing **393** into which the round end portion **394** of a shaft **395** is journaled. A second plate member **396** is similarly secured on the end plate **275** and carries a bearing bushing **397** in axial alignment with the bushing **393**. The shaft has a round portion **398** on its other end, to which is keyed a hub **399** carrying a cam **400**. The hub has a shank portion **403** of reduced diameter journaled in the bearing **397**. The shaft **395** has secured on its left end (Figure 4) the hub **401** of a cam **402**. On the shaft **395** is positioned a plurality of discs **406**, each having a tab extension **407** with a spacer washer **408** between each disc, so that the tabs **407** each is in cooperative relation with a lateral tab **301** of a different key stem **300**. There are sixty discs **406** with tab extensions **407** thereon, numbered from one to sixty and they are positioned on the shaft in that order from left to right.

Each disc **406** has a hole **409** therein in the form of an eight-pointed star, and since these fit on a square shaft, each disc has eight possible positions thereon, and the position thereon determines the number of cents to be given in change. The entire assembly of shaft, cams, discs and tabs is referred to hereinafter as "the cents sensing device **410**."

Detachably mounted in and keyed to the interior bore of the bushing extension **403** is a shaft **404** which in turn has a spur gear **405** keyed on the other end thereof. The spur gear **405** meshes with a gear in the locking drum resetting device **181** which will presently be described.

Secured on the end plate **269** by means of screws **412** is a plate member **411** which is slotted to form a reciprocal mounting for a bar **413**, and which carries rollers **414** and **415** on shafts **416** and **417**, respectively, to reduce the friction and yet to more positively guide the bar **413**. The bar has a stop pin **418** to limit its downward motion. A roller **420**, journaled on a stud shaft **419** is in cooperative relation with and is reciprocated by the cam **402**. The upper end of the bar **413** carries a socket member **421** in which a rack member **422** is mounted and secured therein by means of a screw **423**.

## PANEL FOR MONEY COUNTERS

A money counter panel **425** carries a counter **424** having a gear **426** on its shaft **427** which meshes with the teeth of the rack **422**. A free roller **428** on a stub shaft **429** maintains the rack in mesh with the gear **426**. The counting is effected, in the counter **424**, when the gear **426** rotates in one direction, and does not count when rotated in the opposite direction. The money counter panel **425**, which is preferably formed of metal, has formed integral therewith a base horizontal extension **440** and an upper horizontal extension **430**. Continuous with and extending forwardly from the extension **430** is a plate extension **431** which carries a bearing bushing **500** for the upper end of a shaft **432** (Figure 13).

The portions **430** and **440** have aligned holes therein to accommodate the portions **433**, **433***a* of vertical rods **434**, **434***a*, which are smaller in diameter than said rods and form shoulders, such as the shoulder **435**, upon which the horizontal extension **440** rests. The rods **434** and **434***a*, respectively, are mounted on the main base **175** by means of bolts **436** and **436***a* passing through suitable clearance holes in said base and screwed into the ends of the respective rods. Positioned on the portion **433** of the rod **434** is a sleeve **437** against which the extension **430** rests. The upper end **438** of **433** is threaded to accommodate a nut **439**, and a washer is positioned between the nut and the upper surface of the extension **430**, so that when the nut is tightened a rigid mounting of the panel and its extensions is effected. The extensions of the panel are also mounted on a like extension of the rod **434***a* in a like manner.

The extension **440** has a depending tab **443** on one side thereof, to which a guide block **441** is secured by means of screws **442**.

An end plate **444** has a foot portion **445** secured on the main base **175**, and has a right angled top extension **446** carrying a bearing bushing **447** in which the shaft **432**, near its lower end, is journaled. The end plate **444** also carries a ball bearing **448** in which one end of a shaft **450** is carried. Secured on the outer end of shaft **450** is a gear **449** with a spacer sleeve **451** between it and the bearing **448**.

Spaced apart, on the main plate **175**, from the end plate **444**, is an end plate **452** of a turret frame **455**. This frame includes a second end plate **453** spaced apart from the end plate **452**, a top plate **454**, and a bottom plate **456**. The end plate **452** has a top flange **457** secured to the top plate and a bottom flange **458** secured to the bottom plate. Likewise, the second end plate **453** has top and bottom flanges **459** and **460** secured to said top and bottom plates respectively. The frame **455** is mounted on the main base **175** with spacer strips **461** and **462** therebetween by means of screws **474** passing through the bottom flanges, the bottom plate and said strips.

Mounted on the base **175** is a U-shaped bracket **475** having aligned holes therein, in which a shaft **476** is journaled. Keyed on the right end of the shaft **476** (Figure 14) is the hub of a crank arm **477**, and a clevis pin in this crank arm pivotally connects it to a bar **478** having a stop pin **481** thereon. Keyed on the other end of the shaft **476** is the hub of a crank **479**. Formed integral with the crank **479** is a tail **480**. Pivotally connected to the crank **479** (by means of a pivot pin) is a bar **482** having a slot **483** near its upper end.

Mounted on the end plate **444** is a bracket **484** carrying a bearing boss **485** in which a shaft **486**, carried by a yoke member **487**, is journaled. The yoke member has a lateral extension **488** which carries a stud **489** extending through the slot **483**. A spring **490**, connected to the stud **489** and to a post **491** on the bar **482**, urges the stud **489** to the lower end of the slot **483**. The yoke has spaced arms **492** and **493** carrying opposed studs engaging the external groove **473**.

The shaft **432** has slidably keyed thereto a beveled gear **494** which is adapted to cooperate with the beveled gear **470**. The hub of the gear **494** has an enlarged portion **495** with an external groove **496** formed therein. The shaft **432** has secured thereto, by means of screws **497**, a vane **498**. Keyed to the shaft **432** and having its hub abutting the bearing bushing **500** is a beveled gear **499**.

Secured on the panel **425** is a counter **502** which counts the money accepted and delivered into the coin box. The counter **502** has secured on its shaft a beveled gear **501** which meshes with the gear **499**. A lever **504** having a stud **503** engaging the groove **496** has a shaft **505** (Figure 14) journaled in a bushing **506** mounted in the end plate **444**. The lever **504** carries a stud **507** in its left end which stud extends through an elongated slot **508** in a bar **510**. This bar has a stud **509** thereon near its upper end, and a spring **511** connected to the studs **507** and **509** urges the stud **507** to the upper end of the slot **508**. The bar

510 also carries a stud 512, and spaced apart therefrom a stud 515 which is normally in contact with the tail 480 of the crank 479. A stud 513 is carried by the end plate 444, and a spring 514 connected to the stud 513 and the stud 512 constantly urges the bar 510 downwardly and maintains the stud 515 in engagement with the tail 480.

The bar 510 has a notch 516 in the left edge thereof (Figure 14) and when the bar is in its normal position, the two legs 517 and 518 of a bifurcated bracket 520 straddle the bar above the notch 516. The bracket 520 is secured on the main plate 175.

When the bar 478, which extends through a slot 521 in the main plate, is moved downwardly (in a manner to be presently described) the clutch member 472 is brought into engagement with the clutch member 468. At the same time, the crank 479 is moved clockwise as seen in Figure 14, thereby causing the tail 480 to move the stud 515, and the bar 510 upwardly. The spring 514 is urging the bar 510 toward the left, so that as the bar is raised the notch 516 in the bar engages and hooks into the crotch 519 of the bracket 520 and remains so hooked until it is reset. The bar, via the stud 507, moves the lever 504 clockwise about its fulcrum 505, and the lever, via its stud 503, shifts the beveled gear 494 into mesh with the gear 470. During a reset period of the cycle, a bar 522 carrying a stud 523, to be presently described, is moved to the right, thereby the stud 523 moves the bar 510 counterclockwise about stud 507 as a fulcrum and disengages the notch 516 from the crotch 519 and the bar returns to its normal position under the urge of spring 514.

The locking drum end plate 186 has a shouldered stud 524 secured thereto by a nut 525 and this stud has journaled thereon a gear 526 which meshes with the gear 210, on the locking drum, and with the gear 469, so that the movement of the locking drum is imparted to the clutch member 468.

## DRIVING MECHANISM

Referring now to Figures 14 to 19 inclusive, the frame of the driving mechanism includes a horizontal top plate 721. A depending plate 722 is secured to the top plate, near the right end as seen in Figure 19, by means of an angled bracket 723. Spaced apart from the plate 722 is a depending plate 724 secured to the top plate by an angled bracket 725. A third depending plate 726 is secured to an end plate 727, positioned between it and the plate 724, and disposed 90° with respect to plates 724 and 726, by means of a bracket 728. The plate 727 is secured to the top plate by means of a bracket 729, and to plate 724 by a bracket 730.

A horizontal plate 731 is connected to plates 722 and 724 by means of brackets 732 and 733 respectively. The plate 731 has secured to its lower face, the mounting plate 734 of an electric motor 735. The shaft 736 of this motor extends through a hole in the plate 731 and carries a pinion 737 which meshes with a gear 738, carried on a stud shaft 739. This shaft has an extension 741 of smaller diameter. A ball bearing (not shown) is set into the gear 738 and its inner race engages the extension. A movable clutch member 743, having clutch teeth 742 and an annular groove 714 is keyed on and movable on the hub 745 of a worm 746 journaled on the extension 741. A shifter yoke 747 includes a straight arm 753 and an offset arm 754 joined together by a boss 755 which is journaled on a shaft 748 carried in aligned holes in a yoke member 749 secured on the plate 731. The arms 753 and 754 carry pins, such as the pin 756, engaging the groove 744. A spring post 750 is mounted on the arm 754, and a second spring post 750 is mounted on the yoke 749, and these posts are joined by a spring 752.

A shaft 757 has keyed thereto the hub 759 of a worm gear 758 carrying a cross pin 751, and a bearing holder 760 carried on the plate 724 has a ball bearing therein adjacent to said hub. An extension 762 of the shaft 757, of smaller diameter extends through the bearing and has secured thereto (Figure 15) the hub 763 of a crank disc 764.

The crank disc 764 carries a bearing bushing 767 in which a stud shaft 768, carried by a connecting rod 769, is journaled. A washer 770 is positioned on the stud shaft between the connecting rod and the crank disc. A second washer 771, on the stud shaft, contacts both the face of the bushing 767 and a snap ring 772 engaging a groove in the stud shaft.

The shaft 547 and a shaft 775, in axial alignment are coupled together and so secured by a sleeve 773. The shaft 775 has a portion 776 of its length of reduced diameter beginning at the right edge of the ball bearing holder 774, therefore the shoulder between the two sizes abuts the ball bearing therein. Between the ball bearing and the hub 778 of a gear 779, is a spacer sleeve 777. The shaft portion 776 extends through a clearance hole in the control panel plate 726. Mounted on the protruding end of 776 is a crank arm 782 having a hub 781 with a slot 783 formed therein. The shaft 776 carries a cross-pin 784 which extends into this slot.

As seen in Figure 15, the end plate 727 joins one end of the plate 724 and joins the control panel 726, and a plate 766 joins the other end of plate 724 and joins the control panel 726. These end plates form supports for bearings and other elements to be presently described.

Secured on end plates 766 and 767 are aligned ball bearings in holders 786 and 787 respectively carrying a shaft 788, a portion 788*a* of which is smaller in diameter with a shoulder 804 therebetween (Figures 14 and 15). Journaled on the shaft 788 are beveled pinions 789 and 790 having bushings 791 and 793 respectively. The bushing 791 has aligned slots 792 therein, and in the bushing 793 are aligned slots 794. Between these slots is a clutch member which will be presently described.

The beveled pinions face each other and mesh with a beveled gear 785 which has a hub 807. The beveled gear 785 is journaled on a shaft 808 which is carried in bearings 809 and 810. The large gear 780 has a hub 811 and is keyed on the shaft 808, below the shaft 775, as seen in Figure 15. A helical spring 815 has its inner end set into a radial slot (not shown) in the hub 811 of the beveled gear 785 and its outer end has a looped portion 816 which embraces the shank of a stud 817 mounted on the gear 780, thereby resiliently connecting the latter with the beveled gear 785. The clutch member 795, which may be best seen in Figure 14, forms a working fit on the shaft 788 and has tongues 818 on one end to cooperate with the aligned slots 792 in the bushing 791, and the other end has tongues 819 to cooperate with the aligned slots 794 in the bushing 793. The clutch member 795 also has aligned elongated slots 796 extending axially therein, and a cross-pin 803 in the shaft 788 extends into the slots and permits limited axial movement of the clutch member from a position where its tongues 819 engage the slots 794, to a position where the tongues 819 are disengaged from slots 794 and the tongues 818 engage the slots 792 in the bushing 791 of the pinion 789. As will be explained hereinafter, the last mentioned position places the shaft 788 in driven relation with the pinion 789, and this occurs when any one of the key stems 300 in the group numbers 31 to 60 is depressed. The relation is just as shown in Figure 49 if any of the key stems numbers 1 to 30 is depressed.

The clutch member 795 also has an annular groove 797 thereon formed between two spaced flanges thereon. A stud 798 carried by a lever 800 engages the groove 797, and this lever is fulcrumed on a stud 799 carried by a boss 801 on the panel 726. The lever is offset rearwardly at 802 as seen in Figure 14. A sprocket 805 is keyed on the shaft portion 788*a* and abuts the shoulder 804.

The gear 780, Figure 15, carries a stud shaft 761, and the connecting rod 769 carries a bushing 812, the interior bore of which is journaled on stud shaft 761. On this

shaft, adjacent to the bushing, is a washer 814 which in turn is in contact with a snap ring 813 engaging a groove formed in the shaft 761.

The motor clutch shaft 825, Figures 15, 16 and 34, is positioned in aligned holes in the panel 726, and in the plate 724, and one end extends into a bearing bushing 829 carried on the rear plate 722. The other end extends through the front panel and has secured thereon a crank arm 824, having a hub 823. The crank arm 824 carries a spring post 826, and a spring 828 is connected to the post 826 and to a spring post 827 carried by the panel 726. A collar 830 secured to the shaft 825 abuts the bushing 829 and limits the depth of the shaft into the bushing.

Secured on the shaft is a crank arm 831, having a hub 832 and carrying a stud 834 upon which a bell crank 835 is journaled. One arm 836 of the bell crank carries a spring post 837 which is connected to a spring post 833, on crank arm 831, by means of a spring 838. The other arm 839 of the bell crank has an angular tab 840 thereon which effects the engagement of the clutch, as will hereinafter be explained.

The arm 753 of the shifter yoke 747 carries a lateral ear 841 having a slot 843 therein to accommodate a clutch lock bar 842. The lock bar has an elongated hole 844 therein and spaced apart from this hole is a spring post 845. Near its lower end, the lock bar has a slot 846 formed therein adapted to engage the tab 841 at the end of the slot 843 as will hereinafter be described. The lock bar also has a clearance notch 847 formed therein.

The lock bar 842 is supported on a stud 848 carried by a cradle 850, said stud extending through the elonged hole 844 in the lock bar and having one end of a spring 849 connected thereto, the other end of the spring being connected to spring post 845.

Referring also to Figure 35, a bracket 851 has a foot 852 secured to the top plate 721 in any suitable manner. This bracket has secured thereto a horizontal stud 853, upon which a bearing bushing 854, carried by the cradle 850 is journaled, thus the cradle is supported by the bracket 851. The cradle carries a shouldered stud 855 upon which a roller 856 is journaled.

A shaft 857 is journaled in a hole in the panel 726 and in a bearing bushing 858 carried in the plate 724. This shaft has a sleeve member 860 secured on the end thereof which projects through the panel 726, and the sleeve member has a slot 861 therein. The sleeve member has an arm 862 integral therewith which carries a stud shaft 863, upon which a pawl 875 is journaled. A spring post 864 carried by the pawl is connected, via a spring 866, to a spring post 865 carried by the arm on the sleeve member. Secured on the shaft 857 is a dog 867 having a hub 868. The dog carries a stud 870, to which the connecting bar 478 is connected. The dog also carries a roller 869 which is engaged by the perimeter of the crank disc 764, during the first 20° of each machine cycle. The other end of the shaft 857 is slotted and carries a tab 871 with which the cross-pin 751 in the worm gear 758 cooperates.

The shaft 857 (Figure 36) also carries hub 859 to which an extended arm 872 is secured. The hub 859 also carries an arm 873 having a tab 874 thereon which cooperates with a motor bar, to be presently described.

The mercury switch shaft 876 is journaled in a bearing bushing 880, Figures 49, 50 and 78, and has secured on its outer end a dog 877 having an outwardly extending tab 878 which cooperates with the pawl 875 as will hereinafter be explained. An arm on this dog, carrying the tab engages a stud 879 on the panel 726. Secured to the shaft 876 behind the panel is the hub 881*a* of a crank arm 881. The crank arm 881 carries a clevis pin 882 pivotally connecting it to a connecting rod 883 which is in turn connected to a clevis pin 886 carried by a crank arm 885 having a hub 884 keyed to the shaft 825, so that as the shaft 825 is moved, the switch shaft is moved, through the linkages described. A mercury switch 887 is mounted in a suitable holder carried on the inner end of the shaft 876.

A shaft 888 is journaled in the panel 726 and in the plate 724, and it carries, on its outer end, a cross-pin 889 to be engaged by corresponding slots in a hand crank (not shown) for the purpose of manually rotating the mechanism, when desired, in servicing the machine. The shaft 888 carries on its inner end a beveled gear 895 adapted to be meshed with a beveled gear 896 which is movable with the worm 746 (Figure 19). The beveled gear 895 is normally held out of engagement with the beveled gear 896 as follows: a collar 890 is keyed to the shaft 888, and between the collar 890 and the plate 724 are, a washer 891 abutting the collar, a spring 892 in contact with the washer 891, a second washer 894 in contact with the other end of the spring, and a sleeve 893 having one end in contact with the washer 894 and the other end against the plate 724. Thus the shaft 888 is urged to the left, as seen in Figure 15, and the hub of the beveled gear is thereby held in contact with the right face of the plate. Now when a crank is placed on the left end of the shaft 888 and the shaft is pushed endwise to the right and against the urge of the spring 892, the beveled gear 895 is brought into mesh with the beveled gear 896 and the mechanism can be rotated by rotating the crank.

A motor bar 900 is slidably carried in spaced slotted blocks 898 and 899 secured on the control panel by means of screws 897. The motor bar has a notch 901 formed therein. Spaced to the right of this notch, as seen in Figure 14 is a stud 902, and spaced from this stud is a spring post 935. To the left of the block 898 is a post 903 projecting forwardly and a second post 904 projecting rearwardly, and on the left end the bar has a notch 939 therein. Secured on the rear face of the motor bar by screws 907 (Figure 37) is a strip 905 having a right angled tab 906 formed integral therewith, adapted to cooperate with the tab 874.

An elongated horizontal slot 908 is formed in the panel 726. An arm 910, having an outwardly (as seen in Figure 15) extending tab 911, also has a rearwardly extending shaft 909 which forms a working fit in the slot, and carried on this shaft against the rear face of the panel (Figure 36) is a sleeve 912 which is retained on the shaft by means of a cotter pin 913. A spring 914 is secured to the eye of the cotter pin and to a spring post 915 mounted on the panel. This arrangement urges the tab end of the arm upwardly and thereby insures the engagement of the tab with the notch 901 in the motor bar.

A bell crank 936, which will presently be described, has one arm carrying a spring post 937, which is connected by a spring 938 to the spring post 935 on the motor bar 900.

The motor bar locking member 916, which may best be seen in Figure 36, has a bearing bushing 917 which is journaled on a stud shaft 918 carried on the panel 726. The locking member has a downwardly extending arm 919, carrying a stud 920 which forms a working fit in an elongated slot 922 formed in the bar 522, described above in connection with the engagement of pinions 470 and 494. A washer 921 is positioned on the stud 920 and a spring 923 connects to stud 920 and to a spring post 924 on the bar 522, and functions to hold the stud 920 in contact with the right end of the slot 922. The main panel has a hole 925 through which the stud 523 extends to engage the bar 510.

The bar 522 extends through a slot in a guide member 927 which is secured to the panel by means of screws 926. On the right end of the bar 522 is carried a spring post 928, and a spring 929 connected to this post and to a bracket supporting the main panel urges the bar to the right as seen in Figure 36, which is to the left as seen in Figure 14.

The locking member 916 has a lateral arm 930 having a right angled tab 931 thereon which cooperates with the notch 939 in the motor bar 900 for locking the latter.

The locking member also has an arcuate arm **932** which has a right angled tab **933** on the end thereof, which cooperates with the stud **950** on the locking drum assembly to be presently described. The arm **932** has rounded depression **934** formed therein.

The arm **872**, Figure 36, carries a spring post **940**, to one end of which a spring **941** is connected. The other end of this spring is connected to a spring post **942** on the panel **726**.

The crank arm **782** is connected by means of a stud shaft **943** to one end of a bar **944**. A bell crank **946** has a bushing **948** therein journaled on a stud shaft **947** carried by the panel **726**, and has one arm **949** pivotally connected to the other end of the bar **944** by a pivot pin **945**. The other arm **951** of this bell crank is connected to the bar **370** (which controls the counter bail **323**) by means of a pivot pin **952**.

A stud shaft **953**, mounted on the panel, has a bushing **954** journaled thereon. The bushing is carried by a rocking dog **955** which has one arm carrying a stud **956** and a second arm carrying a stud **957**. A bar **960** carries a stud **961** pivotally connecting it to the clutch shifting lever **800**. The other end of the bar (Figure 14) is pivotally connected to the rocking dog **955**, at a point substantially above the fulcrum of the latter, by means of a pivot stud **959**. The rocking dog has a rearwardly extending spring post **958**, which projects through an oval hole **962** in the panel. A fixed spring post **963** is mounted on the rear of the panel (Figure 36) and a spring **964**, connected to posts **958** and **963**, functions to retain the rocking dog in whichever position it is shifted to.

The bar **386**, which is associated with the bail cooperating with the selector keys Nos. 31 to 60, extends downwardly and has formed integral therewith, and extending to the right, a foot portion **386***a*, the lower surface of which is inclined and which is adapted, when the bar is moved downwardly, to engage the stud **956** and rock the dog **955** in a clockwise direction on its fulcrum **953**. This would result pulling in the bar **960** to the right (Figure 14), the swinging of the shifting lever **800** in a clockwise direction about its axis, and the shifting of the clutching sleeve **795** to the left into engagement with the beveled pinion **789** to cause the sprocket **805** to rotate in one direction, as will be explained in connection with the printing mechanism.

The bar **390**, which is associated with the selector keys Nos. 1 to 60, also extends downwardly and has formed integral therewith and extending to the left, a foot portion **390***a*, the lower surface of which is inclined and adapted, when the bar **390** is moved downwardly, to engage the stud **957** and swing the dog rocker to the position shown in Figure 14, thereby causing the shaft **788** and the sprocket **805** thereon to rotate in the opposite direction. It will be understood that the rocking dog only has a possible two positions, so when a key of the group 1 to 30 is depressed, the rocking dog **955** is shifted to the position shown in Figure 14, and the machine completes a cycle. At the end of such cycle the rocking dog remains in the position it was in during the cycle. Now, if in the next operation of the machine a key in the group 1 to 30 is depressed, the rocking dog is already in the position intended and will continue to remain in this position as long as keys in the group 1 to 30 are successively depressed. As soon as any key in the group 31 to 60 is depressed, the bar **386** effects the shifting of the rocking dog to its other position, etc.

Referring again to the bell crank **936**, the spring post **937** thereon is carried on an upwardly extending arm **965** thereof, and the bell crank has a lateral arm **966**. Parallel to and spaced apart from the arm **966** is a plate member **967**. The bell crank and the plate member are rigidly joined together by a bushing **968**. The bushing is journaled on a stud shaft **969** secured on the panel, so that the bell crank and the plate move in unison thereon and they have aligned holes therein to fit a clevis pin **970**. The bars **386** and **390** have identical elongated slots **989** therein, and the clevis pin **970** extends through these slots, so that as either one of the bars moves down, the bell crank assembly **936** is moved in a counter-clockwise direction on its axis **969**. The bar **386** carries a spring post **971**, and a spring **972** is connected to this post and to a flange portion **974** of a cover plate **975**. The bar **390** carries a spring post **973**, and a spring **976** is connected to this post and to the flange portion **974**. These springs are sufficiently strong to balance the weight of the bars **386** and **390** respectively.

A link member **980** has a hole in its lower end forming a working fit on the clevis pin **970**, so that as either one of the bars **386** or **390** moves downwardly, the link moves therewith without any lost motion.

The upper end of the link **980** has a hole therein engaging a pivot pin **977** carried by a lever **978**. This lever has a bushing **979** journaled on a stud shaft **981** carried on the end plate **269** of the selector key bank; the lever on its left end carries a round boss **982** which normally engages the sprocket **283** between teeth, locking it against movement. A guide plate **983** for the lever **978** is secured on the end plate **269** by means of screws **984**.

The bar **376**, connected to the motor bail crank arm **375**, has secured on its lower end, as seen in Figure 14, a selector key lock link **985**, which has a depending locking arm **986**, a lateral engageable face **988**, and a camming ear **987**. When a selector key is depressed, the arm **986** rests on the slot surface **861**. As the motor bar **900** moves to the left, as seen in Figure 14, the tab **911** engages the face **988** and moves the key lock link **985** to the left, so that the arm **986** is pushed off the slot surface **861** and down into the hollow of the tube **960**. As it moves down, the tab **911** is thereby moved downwardly with it, and out of engagement with the notch **901** in the motor bar and between the face **988** and the left edge of the dog **877**. Due to the fact that the tab is free of the notch **901**, its spring **914** snaps it back to a point where stud **909** reaches the right end of the slot **908** in the panel **726**. This movement causes the dog **877** to move rotatively in a clockwise direction until it is arrested by the stud **879**. The shaft **876** on which the dog **877** is secured: (1) tilts the mercury switch to the "on" position, and (2) causes the clutch **740**, **743** of the motor to engage in time with the starting up of the motor **735**. The machine then functions to issue the ticket corresponding to the selector key depressed and to deliver with said ticket the difference, in change, between the value of the money inserted and the price of the ticket. Of course, if the exact amount of money is inserted, there will be no change delivered.

Near the end of the cycle, the stud **761** in the worm gear **758** engages the tab **871** in the end of the reset shaft **857**, moving the latter rotatively. This results in the restoration of the motor bar ⅛" beyond its "at rest" position, thereby stretching the strong spring **938**, because the bail **323** is held down by the lateral tab **307** on the depressed key stem, and the lateral tab on the latter is still locked by the bail **371** (see Figure 2). The sleeve **860** is thereby rotated below the end of the locking arm **986**, and the latter moves over to be pushed up by the surface of **861**. The pawl **875** drops into engagement with the tab **878** for restoring the dog **877** to its normal position. At the same time, the tab **931** on the motor bar locking member **916** engages the notch **939** in the motor bar **900** and locks the latter, so that the spring **938** pulls hard to release the depressed key, and so that the machine cannot be again operated until the locking drum is restored to its normal position after the depressed key is released and the tab **911** has re-entered the notch **901** in the motor bar.

Now, as the stud **861** on the worm gear **758** passes off of the tab **871** and releases it, the strong spring **941** rocks the shaft **857** back counter-clockwise to its rest

position. During this motion, the key lock **986** was lifted by **861**, releasing the depressed key stem tab **303** from the bail and allowing the depressed key to return to its normal position.

If the vendee holds the key in the depressed position, the tension of spring **938** holds constant until the key is released. When the key is released, the spring **195** in the locking drum assembly **182** restores the latter to zero. As the latter almost reaches the zero point on its return, the stud **950** carried thereon engages the tab **933**, swings the motor bar locking member to a position where the tab **931** is disengaged from the notch **939** on the motor bar, releasing the latter so that spring **938** pulls the motor bar forward about ⅛" until pin **902** on the motor bar engages the bell crank arm **965**.

## PRINTING MECHANISM

The printing mechanism not only includes mechanism driven by the shaft **547** (Figure 18) but also mechanism driven by a shaft **1000** which is coupled to the shaft **757**, the junction of the two shafts being enclosed in the sleeve like hub **1002** of a beveled gear **1001**. Meshing with the latter is a beveled gear **1003** which is mounted on a mutilated gear **1004**. The mutilated gear has teeth **1005** thereon which are sufficient in number to rotate a mutilated pinion **1014** one-half revolution (180°), thereby functioning like a "Geneva" movement.

Secured to the pinion **1014**, and offset upwardly, is a crank **1007**. The pinion and crank are journaled on a shouldered screw **1006**. A shouldered wrist pin screw **1008** is screwed into the arm of the crank **1007**, and journaled on it is one end of a connecting rod **1009**, which has its other end journaled on a shouldered screw **1010**. The screw **1010** engages one end of a lever **1011**, which is fulcrumed on a shouldered screw **1012** which, in turn, engages a base block **1013**. The other end of the lever **1011** is operatively connected to a device which effects printing operations per se, which will be described.

Referring to Figure 19, the chain **295** engages the sprocket **283** on the selector key bank, the sprocket **805**, a sprocket **806**, and a sprocket **706** on a device for tightening the chain.

The sprocket **706** is journaled on a shaft **1015** which is supported in horizontal alignment with the shaft **284**, supporting the sprocket **283**, by means of a bifurcated yoke **1016**. This yoke has aligned holes therein supporting the shaft **1015**, and has a shank **1017** polygonal in form and reciprocally carried in a hole of the same form in a boss **1018** on a standard **1019**. The standard **1019** has a foot portion **1020** which is secured on the main base plate **175**. Secured to the ends of the shaft **1015** and to the upper end of the standard **1019** are springs **1021** (one of which is seen in Figure 19) which constantly and firmly urge the sprocket **706** to the right, thereby maintaining the chain **295** taut.

The sprocket **806** is secured on a shaft **1022** which carries the printing wheel **1025**. This shaft is supported in a ball bearing **1023** mounted in a bearing holder **1024** secured to a sub-frame member **1026**, Figures 18, 19 and 20. A second sub-frame member **1027** carries a ball bearing and holder **1028** which supports the other end of the shaft **1015**. The sub-frame members **1026** and **1027** are secured in fixed spaced relation by means of bolts **1029** and spacer sleeves **1030** as shown, and the sub-frame members are provided with feet **1031** and **1032**, respectively which are secured to the main plate **175** by means of screws or by any other suitable means.

The printing wheel **1025** includes a rim **1033** having a plurality of slots **1034** which extend inwardly from the outer perimeter of said rim. These slots are equidistant, angularly, from each other. Removably seamed in each slot **1034** is a "type slug" **1035** comprising an element which will print upon the ticket, in a manner to be presently described, the name or designation to be printed on said ticket. The printing wheel shown carries sixty type slugs **1035** each corresponding to a different key in the selector bank **268**.

The printing wheel has a hub **1036** which is detachably secured on the shaft **1022**, and a web **1037** is formed integral with the hub and the rim and has a plurality of holes or openings **1038** symmetrically arranged and extending therethrough.

As seen in Figure 38 each type slug **1035** has a hole **1040** extending therethrough to accommodate a disc member **1041**. The slug also has a cross-hole **1039** communicating with the hole **1040** and forming a clearance hole for a screw **1042** which threadedly engages a tapped cross-hole in the disc **1041**. Each slot has a corresponding clearance hole therein at the bottom thereof extending through the inner periphery thereof, so that in mounting a slug in the printing wheel, a disc **1041** is positioned in the hole **1040** in a slug with the threaded hole therein coinciding with the hole **1039**. Then the slug is positioned in the slot (**1034**) with its ends flush with the sides of the rim **1033**, and then the screw **1042** is positioned in the through hole in the bottom of the slot in which the slug is positioned and engaged with the threaded hole in the disc, and then the screw is tightened, forcing the slug firmly against the bottom of the slot.

The web **1037** has a plurality of bosses **1043** formed therein and extending slightly beyond the plane of the right face of the wheel **1025**, as seen in Figure 20. These bosses are counterfaced to centralize a ring **1044** thereon, and the ring is secured to these bosses by means of flat head screws **1045** passing through countersunk holes in the ring and engaging threaded holes in each boss. The outer periphery of the ring has a plurality of teeth or detents **1046** formed therein, one detent for each slot **1034** in the printing wheel.

A lever **1047**, fulcrumed on a shouldered stud **1048** mounted on the sub-frame member **1026**, carries a stud **1049** upon which a free roller **1050** is journaled. The other end of the lever **1047** carries a stud **1051** to which one end of a spring **1052** is connected. The other end of the spring is connected to a stud **1056** secured on a vertical bar **1053** which is reciprocally carried on the sub-frame member **1026** by a plurality of studs **1054** mounted on the frame member and extending through elongated slots **1055** and carrying washers which are larger in diameter than the widths of said slots. The bar **1053** also carries a stud **1057**, and spaced apart from it is a stud **1058** which extends through an elongated slot **1059** in the bar. A spring **1060**, lighter than the spring **1052**, is connected to the studs **1057** and **1058** and urges the bar **1053** upwardly. The bar also has an elongated slot **1061** through which the stud **1051** on the lever **1047** extends.

The bar **1053** has mounted on its upper end spaced lugs **1062** and **1063** with aligned holes therein to accommodate a shaft **1064** upon which a roller **1065** is journaled. The right end of the shaft **1000** is carried in a ball bearing in the holder **1067** carried on a standard **1066**, secured to the main plate **175**.

Secured on this shaft, near the right end thereof, is the hub **1068** of a cam **1069**. The high portion of the periphery of the cam cooperates with the roller **1065** to lock the roller **1050** in engagement with the detent **1046** after the printing wheel is set to print a ticket. When the cam **1089** is in other positions, the roller **1050** freely rides over the detents under the urge of the spring **1052** and the printing wheel may be moved freely in either direction to position the type slug in position to print the name of the station corresponding to a depressed selector key as will be explained hereinafter.

## SHEAR ACTUATOR

A shear actuating lever **1070** is pivotally carried on

a shouldered screw **1071** which is screwed into a bracket **1074**, which is secured to the lower surface of the main plate **175** by means of screws or in any other suitable manner. The lever **1070** has a notch **1072** formed in the right end thereof, as seen in Figure 19, and has a notch **1073** formed in the left end thereof. A bracket **1075** is also secured on the under surface of the main plate **175** and carries a shouldered screw **1076***a* (Figure 33) forming a fulcrum for a lever **1076**, which carries a stud upon which a roller **1077**, engaging the surface of the notch **1073**, is mounted. The lever **1076** carries on its other end a suitable stud **1079** upon which a roller **1078**, cooperating with a cam **1080** is mounted. The cam **1080** has a hub **1081** which is movably fixed on the shaft **1000**.

## TICKET STOCK FEEDER

A mutilated gear **1082** has a hub **1083** which is fixed on the shaft **1000**, and meshing with this gear is a mutilated pinion **1084** which intermittently makes one revolution when engaged by the teeth of the mutilated gear **1082**. The pinion has a hub **1085** which is fixed on a shaft **1088**, and the shaft **1088** is supported in bearings **1086**, carried on a standard **1087**, and **1090** carried on a sub-frame member **1091**. The standard **1087** is mounted on the frame member **1027**, Figures 18, 28 and 29. A cam **1096** has a hub **1097** which is fixed on the shaft **1088**. The shaft **1088** also has fixed thereon a gear **1094** having a hub **1095**, and pressed on the end of the shaft is a knurled wheel **1100**.

The sub-frame member **1091** carries a bearing bushing **1092**, in which a shaft **1093** is journaled, and fixed on this shaft is the hub **1103** of a detent disc **1102**. Meshing with the gear **1094** is a gear **1098** having a hub **1099** secured to a shaft **1137**, to be presently described, and fixed on the shaft **1137** is a knurled wheel **1101**.

A cup-like member **1110**, over which the ticket stock **1135** is fed, has an end wall **1109** and an annular rim **1106** formed integral with each other. The length of the perimeter of the rim **1106** is exactly equal to the lengths of five ticket blanks. The stock has a hole therein which is cut in two when the ticket, Fig. 45, is cut off from the stock so the ticket is rectangular in form with centrally located concavities in the form of semi-circles on each end. The cup-like member has five holes through the rim **1106** located centrally therein and equidistant from each other. Mounted in each hole is the shank of a bullet shaped tooth **1107**, and the tooth is positively secured by means of a nut **1108** engaging threads on said shank. The strip of ticket stock **1135** passes over the rim **1106** with the teeth **1107** engaging the holes in the stock **1135**.

The cup-like member **1110** is mounted on a boss member **1105** secured on the shaft **1093** and having a locating boss **1104** secured thereon by screws **1113**. The wall **1109** of member **1110** has a central hole therein which forms a working fit on the locating boss, and has arcuate slots **1111** and **1112** through which screws **1114**, with washers **1115** thereon, extend to engage threaded holes in the boss member **1105**. By this arrangement, the cup-like member **1110** may be set so that it feeds the ticket stock to a knife which cuts off from the stock the printed ticket. The setting to be maintained should deliver the stock to the knife so that the latter cuts the ticket off, leaving exactly half of the hole in the stock remaining on the severed end of the web of stock **1135**.

A bracket **1116** secured to the frame member **1091** in any suitable manner carries a stud **1117**. A generally curved member **1118** of channeled cross-section has aligned holes in one end which are journaled on the stud **117**. The inner surfaces of the member **1118** clear the surface of the member **1110** sufficiently to permit the ticket stock **1135** to very freely pass therebetween, in fact the main function of the member **1118** is to maintain the stock with the holes therein engaging the portions of the teeth of maximum diameter, thereby insuring proper registration with the knife.

The member **1118** carries a spring post **1119**, to which one end of a spring **1120** is attached. A spring post **1121** mounted on the frame member **1091** has the other end of the spring secured to it, so that the spring **1120** urges the member **1118** away from the surface of the member **1110** for convenience in rethreading ticket stock into the device.

The member **1118** has a bifurcated rolled bracket **1122** secured adjacent to its lower end, as seen in Figure 20, and this bracket carries a pivot pin **1123** therethrough to which one shank end **1123**, of an expansible link, is pivotally connected. The expansible link is comprised of the shank end **1124** and a second shank end **1133** having a spring **1132** positively secured to and forming an expandable connection with each.

A bracket **1125**, secured to the frame member **1091** by means of screws **1126**, has an angle portion **1129**. This bracket carries a stud **1127** upon which a toggle member **1128** is pivoted, and this toggle member has a depending thumb tab **1130** thereon, and it also carries a stud **1131** to which the shank end **1133** is pivotally connected. The toggle member also has a tab **1134** which is adapted to engage an ear formed on the bracket part **1129**. Now when the parts are in the relation shown in Figure 20, the ticket stock is maintained on the member **1110** with the teeth **1107** engaging the holes in the ticket stock. Whenever it is desired to move the member **1118** away from the surface of member **1110**, the toggle member is swung about the stud **1127** in a counter-clockwise direction, thereby causing the spring **1120** to move the lower end of the member **1138** upwardly to a point where the clearance notch **1138** approaches the shaft **547**.

The bracket **1116** has a horizontal portion **1136** forming a table or ledge along which the ticket stock **1135** is advanced to the printing wheel. This ledge has a clearance slot **1146** to clear the knurled wheel **1100**. This knurled wheel has a cut away sector **1147**, and cooperates with the knurled wheel **1101** to advance the ticket stock to the left, as seen in Figure 20. The gears **1094** and **1098** mesh, so the relative movements of the knurled wheels is the same even though the latter may be disengaged by the interposition of the ticket stock between them.

The shaft **1137** (Figures 28 and 29) previously referred to as carrying the knurled wheel **1101** and the gear **1098**, is journaled in a bushing **1139** which is mounted on a lever **1148**. The knurled wheel **1101** is fixed on the shaft **1137**, and the latter extends through bushing **1139** and through the gear **1098** and its hub **1099**, the gear being secured on the shaft by a set screw (not shown).

The lever **1148**, Figure 20, carries a bushing **1149** which is fulcrumed on a stud **1150** supported on the frame member **1091**. The lever **1148** also carries a spring post **1151**, and the foot **1032** carries a spring post **1152**, and a spring **1153**, secured to both these spring posts urges the lever **1148** in a counter-clockwise direction about the fulcrum **1150**, and consequently the knurled wheel **1101** is urged into contact with the knurled wheel **1100**.

## TICKET REGISTRATION

Referring now to Figures 22 and 28, a boss **1145** carried on frame member **1091** has journaled therein a shaft **1144** supporting a detent lever **1140** which carries, on one end thereof, a roller **1141** which is journaled on a stud **1141***a* on the lever and cooperates with the cam **1096**; and the lever carries, on the other end thereof, a stud **1143** upon which a roller **1142**, cooperating with the detent cam **1102** is mounted. The lever carries a spring post **1154** to which one end of a spring **1156** is connected. The other end of this spring is connected to a tab **1155** on the frame member **1027** and thus the lever **1140** is constantly urged in a clockwise direction, as seen in Figure 22, thereby

maintaining the roller 1142 in contact with the periphery of the detent cam 1102 until such time as the high portion of the cam 1096 acting against roller 1141, frees the roller 1142 from the cam 1102.

## MASK PLATE

A mask plate 1160 has: a rectangular opening 1158 through which the station names carried by the type slugs 1035 are printed on the ticket stock; a rectangular opening 1159 through which the date, carried by a dater to be presently described, is printed; and a third opening 1157 through which an identification number or symbol is printed. Formed integral with the plate 1160 is an upright side 1161, and formed integral with the upper edge of the side 1161 is a laterally extending camming ledge 1162 which is actuated in a manner to be presently described. A Z-shaped arm 1163 has one end secured to the side 1161, and the other end thereof has a boss 1164 secured thereto. This boss is journaled on a stud shaft 1165 carried on the frame member 1091 and is retained thereon by a nut 1166 engaging a threaded end of the shaft and abutting a shouldered portion of the shaft.

## TICKET SHEARING DEVICE

A shaft 1167 has a hexagonal head 1168 formed on one end. The other end has a portion 1169 of reduced diameter which extends through a hole in the main plate 175 with the shoulder thus abutting the lower surface of the main plate and secured in this relation by a nut 1170. A second shaft 1171 also has a hexagonal head 1172 formed on one end and a shoulder and a portion 1173 of reduced diameter on the other end. Said portion extends through a hole in the main plate 175, spaced apart from the shaft 1167, and secured therein by means of a nut 1174 with the shoulder hard against the lower surface of the plate, whereby the two shafts are parallel. A bridge member 1175 has holes in each end which fit the shafts, and this member rests on the heads 1168 and 1172. A rectangular frame 1180 is comprised of; a horizontal bar 1177 having spaced parallel bearing holes therein which form working fits on the shafts 1167 and 1171; a second horizontal bar 1178 having spaced parallel bearing holes which form working fits on the shafts 1167 and 1171; and vertical bars 1179 and 1181 which are secured to the ends of the bars 1177 and 1178 to form a rigid frame.

The bar 1178, intermediate its ends, carries a stud 1183, upon which a roller 1182 is journaled. This roller is engaged by the notched end 1072 of the knife actuating lever 1070. A block member 1185 is fixed on the shaft 1167 a predetermined distance below the main plate 175, and a second block member 1186 is fixed on the shaft 1171 the same distance below the main plate. Secured to the block members 1185 and 1186 are depending arms 1187 and 1188 respectively which form supports for the ends of spaced rollers 1189 and 1190. A spring 1191 is positioned on the shaft 1167 between the bar 1177 and the block member 1185, and a second spring 192 is positioned on the shaft 1171 between the bar 1177 and the block member 1186 and constantly urge the frame member 1180 downwardly toward rubber buffers 1184 and 1176 carried on the shafts 1167 and 1171 respectively. A knife or shear blade 1193 is fixed to the block members 1185 and 1186, and a cooperating knife or shear blade 1194 is pivotally connected to the blade 1193 and is linked to and movable with the bar 1178.

As the shaft 1000, carrying cam 1080, rotates the lever 1076, which engages the notch 1073 in the knife actuating lever 1070, moves the latter in a counter-clockwise direction and it, acting against the roller 1182 raises the rectangular frame 1180 up from its normal position in contact with the buffers 1176 and 1184, to an elevated position where the shear blades 1193 and 1194 are open so that the ticket stock 1135 may pass between them. At the proper time in the operating cycle of the machine, the cam allows the rectangular frame 1180 to drop downwardly, as seen in Figure 19 under the urge of the springs 1191 and 1192, thereby closing the shear blades 1193 and 1194 and severing the printed ticket from the ticket stock strip 1135.

## DATING AND CODING MEANS

A dating device, Figures 30, 31 and 32, is secured to the plate 1026 by means of a bracket 1214 which is secured to the end plate 1197 and to the plate 1026 in any suitable manner, and the bracket 1215, which is secured to the end plate 1198 and to the plate 1026. The dater includes; a "year" printing wheel 1199 which is secured on a shaft 1203 journaled in the end plate 1197 and in a sleeve shaft 1204. The shaft 1203 carries on its outer extremity a knob 1207 with indications of the years thereon. The sleeve shaft 1204 has a printing wheel 1200 carrying the "unit" dates thereon on one end thereof and has a knob 1208 on the other end indicating the unit dates. A sleeve 1205 has thereon a printing wheel 1201 carrying "tens" dates on one end and a corresponding knob 1209 on the other end. A sleeve 1206 has a printing wheel 1202 on one end for printing "months," and has a corresponding knob 1210 on the other end thereof. The dater includes a washer between the wheel 1202 and the end plate 1198 and a pawl, for each printing wheel, which engages ratchet teeth thereon. The body plate 1196 has a depression or well 1211 therein in which a printing slug 1212 bearing identification data is positioned and secured therein by means of screws 1213.

## PRINTING PAD

Referring to Figures 23 to 26, the main base plate 175 has a rectangular hole 1216 formed therein. A shouldered stud 1224 has a threaded shank (not shown) extending downwardly through a clearance hole in the main base plate adjacent to the left edge of the hole 1216, Figure 24, and is secured therein by a nut. However, before the nut is applied, the shank is passed through a clearance hole in a tab 1218, forming part of an end plate 1217, and is also passed through a cushioning washer 1223 which is positioned between said tab and the base plate. A second shouldered stud 1231 also has a threaded shank (not shown) which extends downwardly through a clearance hole in a tab 1228, forming part of an end plate 1225, through a cushioning washer 1230 and through a clearance hole formed in the base plate 175 adjacent to the other end of the rectangular hole 1216. The end plate 1217 has a right angled ears 1219 and 1221, and the end plate 1225 has right angled ears 1226 and 1227. A side plate 1232 has one end spot welded to the ear 1219 and the other end spot welded to the ear 1226. An opposite side plate 1255 has one end spot welded to the ear 1221 and the other end spot welded to the ear 1227, thereby forming a rigid structure 1220, generally in the form of a hollow rectangle.

The side plate 1232 has a portion cutaway extending upwardly from its bottom edge of rhomboidal form, leaving an angular camming surface 1233, a straight horizontal surface 1234 and a second angular camming surface 1235, all said surfaces being joined. The opposite side plate 1255 has its bottom edge straight in a horizontal sense. The upper edge of the side plate 1232 has an inclined portion 1236, joining a depressed horizontal portion 1237 and joined by an inclined portion 1238. The upper edge of the side plate 1255 has identical portions which are individually in horizontal alignment with the surfaces 1236, 1237 and 1238.

The shouldered stud 1224 has a shank 1222 extending upwardly and its upper end is threaded. Likewise the shouldered stud 1231 has a shank 1229 extending upwardly and its upper end is threaded. A top plate 1240 has turned down edges 1241 and 1242 and beyond these

edges at the ends thereof are: a tab **1243** with a clearance hole therein and positioned on the shank **1222** of shouldered stud **1224**, and a tab **1244** with a clearance hole therein and positioned on the shank **1229** of the shouldered stud **1231**. The turned down edges are identical (on both sides) and include edges such as the inclined edge **1245**, the straight edge **1246** and the inclined edge **1247**. The edges **1236**, **1237**, and **1238** are parallel to the edges **1245**, **1246**, and **1247**, so that a roller, such as the roller **1256** may easily traverse the space between the oppositely positioned surfaces, and on the opposite side a roller **1258** may do likewise.

Positioned on the shank **1222** in contact with the end **1243** is a spring **1261** with a washer **1265** on top, and by means of locknuts **1263** any desired pressure may be obtained by adjusting the nuts **1263** and they may be locked to retain such adjustment. Positioned on the shank **1229** of the shouldered stud **1231** is a spring **1262** with a washer **1265** on top, and by means of nuts **1264** a desired pressure may be adjusted for and the nuts may be locked to retain such adjustment.

The printing pad **1266** includes a body **1267** carrying a through shaft **1260** with extended ends **1268** and **1269** carrying grooves to accommodate snap rings. Journaled on the end **1268** is a roller **1256** having a flange **1257**, Figure 25, and journaled on **1269** is a roller **1258** having a flange **1259**. Also journaled on **1268** and **1269** are rollers **1270** and **1272** respectively which are retained on the respective shaft ends by means of snap rings **1271** and **1273**. The purpose of the rollers **1270** and **1272** will be presently explained.

A shouldered stud **1248** has a shank **1249** which is riveted to the top plate **1240**, and a shank **1250** extending upwardly and having its end threaded. An inverted U-shaped member **1251** has a central clearance hole through which the shank **1250** extends and the extremities extend through spaced slots in the top plate **1240**. A spring **1252** positioned on the shank **1250** with a washer **1253** presses the member **1251** against the shoulder of stud **1248**, and this pressure may be set as desired by means of nuts **1254** on the shank. The extremities of member **1251** cooperate with the rollers **1256** and **1258** in a manner to be presently explained.

The body **1267** of the printing pad has an arcuate surface **1274** the periphery of which is radial about the axis of the shaft **1260**. The body includes angular surfaces **1275** and **1276** which join the surface **1274** with convex fillets therebetween, the included angle of surfaces **1275** and **1276** being about 84°. The body also includes a boss portion about the shaft and tangential surfaces joining surfaces **1275** and **1276**. A pad **1277** of leather or any other suitable material spans the arcuate surface **1274** and has ends overlapping and secured to the angular surfaces **1275** and **1276**.

A lateral stud **1278** is screwed into the body **1267** and secured with a locknut **1279**. This stud cooperates with and cams on the surfaces **1233**, **1234** and **1235**.

The means for reciprocating the frame or structure **1220** carrying the printing pad includes the Geneva movement **1004**, **1014**, the crank **1007**, the connecting rod **1009**, and the lever **1011**, which have already been described in connection with Figure 18. The lever **1011** is secured to a bearing boss **1239**, and this boss is in turn secured to a second lever **1280**, as may best be seen in Figures 24 and 23. The end of the lever **1280**, as may be seen in Figure 23, has a slot **1281** formed therein, and a roller **1282** forms a working fit in the slot **1281**. A member **1285**, which may be seen in cross-section in Figure 27, has upwardly directed flanges **1287** and **1288** formed integral with a horizontal web therebetween. Secured to the flange **1287**, by means of screws **1290**, is an elongated vertical strip **1291** having a horizontal flange **1292** along a portion of its length. Secured to the flange **1288**, by means of screws **1293**, is an elongated strip **1294** having a horizontal flange **1295** along a portion of its length paralleling the flange **1292**. The member **1285** on its right end, Figure 23, beyond the ends of the strips **1291** and **1294** is flat and has oppositely extending ears **1284** and **1286** formed thereon.

A stud shaft **1283**, upon which the roller **1282** forms a working fit, is riveted or otherwise secured on the ear **1284**. An elongated "way" strip **1296** has V-shaped edges **1297** and **1298** formed thereon. A block member **1299** has in its right edge, a V-shaped groove which matches and forms a working fit on the V-shaped edge **1297** of the strip **1296**. The block member **1299** is secured to the member **1285** by means of filister head screws, one of which is shown at **1300**, the heads of the screws being countersunk in the block member and the threaded shanks engaging threaded holes in the web **1289**.

A block member **1301** has in its left edge, a V-shaped groove which matches and forms a working fit on the V-shaped edge **1298** of the strip **1296**. In mounting the member **1285** and its assembled parts on the strip **1296**, the block member **1299** is secured therein by means of the filister head screws **1300** first. The block member is then positioned with its groove in contact with the edge **1298**. Then the assembly is applied with the groove in the block member **1299** engaging the edge **1297**, following which flat head screws **1302** are caused to engage threaded holes in the block member **1301** and they are screwed in until their heads occupy the countersinks in the web **1289**, thus the assembly may be reciprocated along the strip **1296**.

The strip **1291** has a tab **1303** formed on the left end, as seen in Figure 23, and a like tab **1304** is applied to reinforce the tab **1303**. Likewise the strip **1294** has a tab **1305** formed on its left end and a like tab **1306** is applied to reinforce it, see Figures 24 and 25 also. These tabs all have aligned, elongated holes **1307** which are of diameters to accommodate the rollers **1270** and **1272**, said holes being elongated to permit a predetermined rise and fall of the axis of the printing pad. Within the structure **1220** are two studs **1308** and **1309** which are spaced apart from each other and which are sequentially engaged by and arrest the printing pad as the latter reaches the end of its stroke in each direction.

In Figure 24 is shown one normal or at rest position of the printing pad, and the other normal or at rest position of the printing pad may be seen in Figures 20 and 22.

## CARBON PAPER STRIP

Referring to Figure 20, a bracket **1310** has a vertical leg secured to the frame member **1027** by mens of screws, one of which is shown at **1311**. The horizontal leg of this bracket carries a vertical shaft **1312** which carries a friction disc **1313** which is engaged by a wire belt **1314**, which also spans a grooved stud **1360** on the bracket **1310**, the function of which is to impose friction on the disc and consequently on any roll of strip carbon placed on the shaft **1312**. A drum like casing **1315** is provided, and a roll of strip carbon paper is placed on the shaft **1312** and is pressed downwardly until it seats in the casing. A guide member **1316** has a tab **1317** which is secured to the upright **1027**, thereby rigidly positioning the exit of the guide member in registration with the lower end of a chute **1318** which has guide flanges **1319** and **1320** along opposite edges thereof. Midway the chute **1318** is a bridge portion **1321** which has a rectangular aperture (not shown) therein. In registration with this aperture is a second aperture formed in the body of the chute. A microswitch **1322** is mounted on the underside of the chute and the actuating arm **1323** of this switch has a curved end **1324** which extends through the aperture in the chute and contacts the carbon paper strip **1325**. This strip prevents the curved end **1324** from entering the aperture in the bridge portion **1321**. However, when the supply of carbon paper runs out, said last mentioned aperture is uncovered, the curved end **1324** enters it and closes the contact members in the micro-switch, thereby setting up

a signal indicating that the carbon paper is exhausted, as will be described in connection with the circuit diagram.

A curved guide member 1326 extends downwardly from the ledge 1136 and it has a tab 1327 which is secured on the frame 1027, and this guide member guides the carbon paper strip from the chute 1318 to a roller 1328 carried by the mask plate 1160. The carbon paper extends across the mask plate in contact with the upper surface thereof with the carbon carrying surface up. The ticket stock 1135 also extends across the mask plate face down and in contact with the carbon carrying surface of the carbon paper. The carbon paper passes over a roller 1329 on the other end of the mask plate. (The left end, Figure 20.) After the carbon paper leaves the roller 1329, it passes under the roller 1189 and over the roller 1190 to a take-up mechanism.

## CARBON TAKE-UP REEL

Referring now to Figures 33, 41 and 40, the carbon paper strip leaving the roller 1190 passes down to the hub 1331 of a takeup reel 1330. A support member 1333 has a foot piece 1334 which is secured to the main plate 175 by means of screws one of which is indicated at 1335 in Figure 40. A stud 1336 secured to the support member has formed integral therewith a shaft 1332 upon which a ratchet wheel 1337 is fixed. The hub 1331 of the take up reel fits the shaft 1332 sufficiently tight to be driven by the shaft and yet to be removable therefrom when the reel becomes filled with carbon paper. A pivoted lock pawl 1338 is mounted on the support member adjacent to the ratchet wheel 1337 and a spring on the pawl shaft engages a stud 1339 and the pawl, thereby constantly urging the latter into engagement with the teeth of the ratchet wheel. A leverage member 1340 has one end journaled on a stud shaft 1341, carried by the support member, and has formed therein an elongated slot 1342 which normally is slightly inclined with respect to the horizontal. This leverage member also carries a stud shaft 1343 upon which a pawl 1344 is journaled. A spring 1358 embracing the hub of the pawl has one end engaging a pin 1357 and the other end partially embraces the pawl, urging it into engagement with the ratchet wheel 1337.

A shouldered screw 1356 extends through a clearance hole formed in the upper end of a connecting rod 1346 and engages a threaded hole 1347 in the knife actuating lever 1070. The lower end 1348 of the connecting rod is twisted to lie in a plane at a right angle to the plane of the main portion of the connecting rod, and extending through a hole in said lower end is a shouldered rivet 1349 extending through a corresponding hole in one leg 1351 of a Z-shaped member 1350. The leg 1351 is substantially vertical, and the member 1350 has, joining the leg 1351, a horizontally extending portion 1352 and a depending portion 1353. The portion 1353 carries a stud 1345 which extends into and cooperates with the elongated slot 1342, and also carries a stud shaft 1354 upon which a roller 1355 is journaled.

The roller 1355 bears against the carbon paper on the hub of the reel. Each time the knife actuating lever is oscillated by its cam 1080 actuating the lever 1076, the pawl 1344, Figure 41, advances the ratchet wheel and causes carbon paper to roll onto the hub 1331 of the reel. As the convolutions or turns of carbon paper build up on the reel hub, gradually increasing its diameter, the roller 1355, in contact therewith causes the member 1350 to move toward the left, as seen in Figure 41, gradually increasing the radius on which the leverage member swings, with the result that the movement of the ratchet wheel becomes less and less as the layers of carbon paper build up on the reel hub, thereby compensating for the constantly increasing radius of the carbon paper taken up on the takeup reel.

In Figure 20, the shaft 1150 carries a disc or wheel 1359 which centrally contacts the ticket stock along approximately its center axis, thereby keeping the ticket stock 1135 from rising and falling as it passes over the surface of the ledge 1136, so that a micro-switch like the switch 1322, for example, may be mounted so that the curved end, like end 1324 may normally contact the ticket stock passing over the surface of the ledge 1136, at a point adjacent to the disc 1359, and maintain the switch with its contacts constantly open. However, if the ticket stock is exhausted, it is no longer present to hold the contacts open, so they close and indicate to the service man that the ticket stock supply in the machine is exhausted.

The shaft 547 in Figure 18 has its right end extending into a bearing carried on a bracket 1362, secured to the under surface of the main plate 175 by means of screws 1363. The main plate has an elongated slot 1364 formed therein, and a spur gear 1365, having a hub 1366 is secured on the shaft 547. A portion of this gear extends through the slot 1364 and meshes with a gear 1361 in the locking drum resetting device 181.

The gear 1361 is mounted on a bushing 1367 which is journaled on the reset shaft 222. Also fixedly secured on the bushing 1367 is the hub 1369 of a radial arm 1368. A hub 1370 is fixed on the reset shaft 222 by means of a taper pin 1371. This hub has fixed on one end thereof a radial arm 1372 and fixed on the other end is a like arm 1373. Conjointly supported in aligned holes in the arms 1372 and 1373 is a shaft 1374. The left end of the shaft 1374 extends into the path of the radial arm 1368, and the right end of the shaft 1374 extends beyond the arm 1373 and into the path of a radial arm 1375 which is mounted on a hub 1376 journaled on the shaft 222. Fixed on the hub 1376 is a pinion 1377 with which a rack 1378 is meshed. The rack is maintained in cooperative relation with the pinion 1377 by means of a flanged roller 1380 which is journaled on a stud shaft 1379 carried on the standard 242. The gear 1361 Figure 18, carries headed shouldered studs 1331 upon which a cam plate 1382 is mounted. The studs extend through corresponding elongated slots 1383 and form working fits therewith. Springs 1384 connected to the gear and to the plate urge the plate 1382 downwardly so that the studs are adjacent to the upper ends of the slots 1383. The cam plate carries, near the upper end thereof, a stud 1385 upon which a roller 1386 is mounted. This roller is preferably a small ball bearing, and it is retained on the stud 1385 by a snap ring 1387 engaging an annular groove formed on the stud. A gear 1388 has a hub 1389 which is journaled on the shaft 222. Mounted on the hub 1389 is a five lobed cam 1390 with which the roller 1386 cooperates. The cam plate 1382 carries two spaced spring posts 1395. Mounted on the gear 1361 are two spaced spring posts 1396, and one of the springs 1384 is connected to one set of posts 1395, 1396, and the other spring is connected to the other set of posts 1395, 1396 their urges are along paths parallel to the path of movement of the cam plate. The elongated slot 1383 has a widened portion 1397 to clear the hub 1367 of the gear 1361. Meshing with the gear 1388 is an idler gear 1391 which has a hub 1392 journaled on a stud carried on a standard 1393. The standard 1393 has a foot portion 1394 which is secured to the main plate 175.

## ELECTRICAL CIRCUITS IN THE MACHINE

Referring to Figure 42, which shows the circuits in the machine, switch contacts 1498 and 1499 are connected to a source of current, and when the switch is closed these are respectively engaged by switch arms 1513 and 1514. A jumper 1515 is connected between the switch arm 1513 and a fuse 1516, and a conductor 1517, when the switch is closed, forms an extension of one side of the source of current.

Likewise a conductor 1518, which is connected to the switch arm 1514 via a fuse 1519 and a jumper 1520, forms an extension of the other side of the source when the switch is closed.

A conductor 1521 is connected to 1517 and to one ter-

minal of the motor **735**, and the other terminal of the motor is connected via a wire **1522** to one terminal of the mercury switch **887**. The other terminal of this switch is connected via a wire **1523** to the conductor **1518**, so that when the mercury switch closes the motor will start running.

A coin slot **1534** via which coins are placed in the machine has a shutter **1527** which closes the slot **1534** at all times when a solenoid **1525** is not energized. The solenoid has a plunger **1526** which is connected to the shutter. One terminal of the solenoid is connected via a wire **1531** to a contact arm **1530**. A second contact arm **1529** normally contacts contact arm **1530** and is connected to the conductor **1517** via a wire **1528**.

The other terminal of the solenoid **1525** is connected via a wire **1532** to a contact arm **1533**, and a contact arm **1534** is moved into contact therewith by the camming action of the end of the connecting rod **769**, Figure 17. Contact arm **1534** is connected to the conductor **1518** via a wire **1535**, thus completing a circuit through the solenoid **1525** when the connecting rod is in the right position. The cam is so timed that it closes the contacts **1534**, **1533** just at the end of the reset cycle of the machine, so that the contacts remain closed while the machine is at rest.

A latching relay winding **1536** has one terminal connected via a wire **1537** to the wire **1535** and its other terminal is connected to a conductor **1538**. A conductor **1539** is connected to the conductor **1517**, and bridging the conductor **1538** and **1539** are several normally open micro-switches as follows:

A micro-switch **1544**, which is closed when the ticket stock **1135** becomes exhausted and energizes the winding **1536**. When the winding is thus energized, the depending leg of the bell crank **1540** is drawn toward the core and the horizontal leg raises the contact arm **1529**, thereby interrupting the flow of current through the solenoid **1525** and allowing the shutter **1527** to close the coin slot **1524** so that thereafter, until a fresh supply of ticket stock is placed in the machine, it is impossible to insert any coins in the machine. When the bell crank is attracted as described above, the latch **1541** is drawn upwardly by the spring **1542** and latches the bell crank up and maintains contact arm **1529** in an "out of contact" relation with the contact arm **1530**. When the service man has replaced the ticket stock, he manually resets the relay **1536** by unlatching the bell crank **1540**.

A second micro switch **1545** which functions in the same manner as that described above for the switch **1544**, is closed when the supply of quarters change has become exhausted.

A micro switch **1546**, which functions in the same manner as that described above for the switch **1544**, closes when the supply of nickels change has become exhausted.

A micro switch **1547**, which functions in the same manner as that described above for the switch **1544**, closes when the supply of pennies change has become exhausted.

A micro switch **1322**, which closes when the supply of carbon paper strip **1325** has become exhausted.

A signal lamp **1550** has one terminal thereof connected via a wire **1548** to the conductor **1518** and the other terminal is connected via a wire **1549** to a switch arm **1551**. A switch arm **1522** in cooperative relation with the switch arm **1551** but normally open is connected via a jumper **1553** to the conductor **1517**. Now whenever the switch arm **1551** is moved into contact with the switch arm **1552**, the signal light is supplied with current.

A relay winding **1555** has one terminal connected via a wire **1554** to the wire **1548**. The other terminal of this winding is connected by a wire **1556** which is parallel to the extreme end portion of the conductor **1517**. A plurality of normally open micro switches bridge the wire **1556** and the conductor **1517** and when any one of these switches is closed, energy is supplied to the relay winding **1555** and it attracts the depending leg of the bell crank **1557** so that the horizontal leg raises the contact arm **1551** in contact with the arm **1552**. As the depending leg of the bell crank is attracted, it is latched by the notch in the latch arm **1558** which is urged upwardly by the spring **1560**. Once the bell crank is latched, it remains so until a service man manually releases the latch arm **1558**.

The bridging switches referred to are as follows:

A micro switch **1561** which closes when the supply of ticket stock reaches a predetermined low, so that a warning is given in sufficient time for the service man to replenish the supply thereby preventing the machine from being out of commission.

A micro switch **1562** which closes when the supply of change in quarters reaches a predetermined low.

A micro switch **1563** which closes when the supply of nickels reaches a predetermined low, and

A switch **1564** which closes when the supply of pennies reaches a predetermined low.

## PHASES OF MACHINE CYCLE

Referring to the chart Figure 43, when a selector key **315** is depressed, tripping the motor switch **887** and the clutch **791**, **795** or **793**, **795**, the cycle of the machine is started.

*Phase "0"*

During the first 20° of the cycle, as indicated by "0" on the chart, the clutch **472**, **468** that rotates the nickel change set-up is engaged and also the bevel gears **470** and **494** that drive the counter **502** recording money deposited in the money box are engaged.

*Phase "1"*

The main rock shaft **775** of the machine starts to rotate and during the first 180° this will pick up the shaft **183** in the center of the locking drum assembly **182** and will reset this shaft to zero by the time the main rock shaft **775** has rotated 190°, which is 180° of the machine cycle. As this is happening, the locking drum **182**, urged by the spring **195** inside the locking drum assembly, has also re-set to whatever extent is represented by the money deposited exceeding the price of the ticket. This difference is the change to be delivered in nickels and/or quarter and nickels, along with the ticket. While this was happening, the nickel change set-up clutch **468**, **472** being engaged, the shaft **464** was rotated as many increments or steps as there are nickels to be delivered. Likewise, the counter **530** that records the change delivered has been rotated to indicate the amount of change in nickels and/or quarters. During this same time, the cent sensing shaft **410** has been rotated until it is arrested by the projection **303** on the key stem. At 180° of the machine cycle, the clutch **472**, **468** on the nickel change shaft **464** has been disengaged and this shaft is free to return to the "at rest" position under the urge of the torsion spring **1089** on the shaft **464**. However, it is restrained from returning by two pawls **626** and **627** engaging the ratchet **635** under the nickel coin turret **570***a*.

*Phase "2"*

During the first half of the machine cycle, the vertical shaft **542** is rotated in a clockwise direction through gears **545** and **546**, and while this shaft is moving in said direction the clutch members **552** and **549** slip by the member **552** moving up out of engagement with the elongated slot **553**.

*Phase "2a"*

During the second half of the machine cycle, the shaft **542** is rotated counter-clockwise, and the clutch members **552** and **549** cause the gear **550** to rotate. Since the gear **550** is meshed with gears **561** and **562**, the coin turret shafts **571** and **571***a* are also rotated and the cents coin turret **570** and the nickel coin turret **570***a* are each rotated ⅕ of a revolution, so that four of the five coin

tubes on these turrets pass the coin pickers **595** and **595***a* respectively. When the change setup shaft **464** was rotated, if change was to be given, a cam **656** on this shaft lifted the nickel picker **595***a*. As the shaft **560** which supports and drives the nickel turret **570***a* is rotated, wedge cams **623** on the gear **562** on this shaft cause the lifting of the escapement pawls **626** and **627** as each coin tube **581***a* passes the picker **595***a*, thereby picking out as many nickels as would be represented by the position of the cam **656** which lifted the picker. On this cam there is a depression **657** at five nickels, or 25 cents. On the same shaft **464** with this cam is another cam **665** adapted to permit the quarter picker **690**, which is normally forward, to drop back in the event that the change requires five or more nickels. This cam **665** causes the substitution of a quarter for the first five nickels. For example, if the change to be delivered is 35 cents, the nickel picker cam **656** will have rotated to a point where the picker roll **660** has dropped into the depression **657** and again been lifted. Therefore, two nickels change will be given during Phase "1," the escapement operation of the cycle, at which time the picker roller **660** will drop into depression **657** in the cam, and meantime the quarter picker cam **665** will prevent any further movement of the shaft **464** on which these cams are mounted, so that the change delivered will be one quarter and two nickels. At the very end of the cycle, the quarter picker **690** is sent forward to eject one quarter and the escapement pawls **626, 627** on the nickel cam are lifted free by crank member **640**, which is actuated by push bar **644** when the latter is moved by stud **647** on shaft **547** so that the shaft **464** can return to zero.

While this is happening, the cent turret **570** likewise is revolving and the cent sensing shaft **410** is being rotated backward to the restoring position in timed relation to the revolving of the cent coin turret **570**. The number of cents picked out will correspond with the number of increments of movement of the cent sensing shaft **410** before it was arrested by the projection **393** on the stem of the depressed key.

*Phase "3"*

When the selector key **300** has been depressed, if that key is any one in the group 1 to 30, it will have operated the motor bar **900** which would have engaged the clutch **795** with **790**. On the other hand if the key depressed had been any one in the group **31** to **60**, the clutch **795** would have been engaged with the pinion **789**. The engaging of either one of these pinions with the clutch causes the printing wheel **1025** to be rotated under the urge of a spring **815** until the engageable member on the drive chain **295** engages the lug **294** in the first instance, or the engageable member **293** in the second instance, on the key stem **300** which has been depressed. This engagement causes the printing wheel **1025** to stop, with the type slug **1035** for the selected destination uppermost in position to print. All of this will occur somewhere between zero and 140°.

*Phase "4"*

At 150° of the machine cycle, the Geneva movement **1004, 1014** picks up the drive to effect the printing of the ticket and this printing of the ticket is completed at 210°. (Drive crank of printer linkage is rotated 180°).

*Phase "5"*

A second Geneva movement **1082, 1084** picks up the drive at 210° of the machine cycle to cause the ticket to feed out. This is completed at 300° in the machine cycle.

*Phase "6"*

At 320° of the machine cycle, the cam **1039** lifting the shear **1194** to chop the ticket reaches the drop off point and the printed ticket is chopped off from the ticket stock somewhere between 315 and 325° of the cycle.

*Phase "7"*

When selector key has been depressed, its key-stem is moved into zone of movement of the bail for its group, at approximately 40° after start of machine cycle. Pin **784** on shaft **776** picks up crank **782** through lost motion slot **783** operating bail **323** through crank **782**, bar **944**, bell crank **946**, bar **370** and crank arm **368**, thereby raising the lever **321**, which was set by the depressed key, to its extreme upward position, thereby causing the counter **337** for the city selected to add "1," and at the same time causing the total counter **338** which counts the total tickets, sold, to add "1."

*Phase "8"*

At approximately 330° of the machine cycle, a pin **761** on the worm gear **758** of the motor drive engages the tab **871** and operates shaft **857**, which re-sets the motor bar **900** to its latched position and thereby applies the power of the heavy spring **938** to urge the restoring of the key which had been depressed. Also, the key lock **985** has been engaged at **861** on shaft **857**. At about 355° the pin **761** on the worm gear passes the point where it releases shaft **857**, which is restored under the urge of a heavy spring **938**, and in the restoring the key lock **985** is released.

*Phase "9"*

The shaft **857** is rotated counter-clockwise as seen in Figure 14, and the surface of slot **861**, Figure 15, picks up locking arm **986**, Figure 14, raising bar **376**, the crank arm **375** and moving shaft **372** carrying bail **371**, thereby moving the bail to an unlocked position so the depressed selector key returns to its normal position. The release of the locking arm **986** also allows the motor switch to snap to the "off" position. During this time, or if the motor coasts after being shut off, the same pin **761** on the worm gear **758** engages a roller **956** which disengages the main drive clutch **740, 742** and the machine comes to rest at approximately zero of the cycle.

*Phase "10"*

If the key is still being held depressed by the ticket purchaser, the cycle of the machine will not repeat. When the key is released the plunger **351** on the bottom of the key stem is withdrawn from the cut out **206** of the locking drum disc. The spring **195** inside the locking drum restores the latter to zero and as it restores to zero a pin **950** on the locking drum gear **210** strikes a lever **916** which releases the latch **931, 939** on the motor bar **900** and disengages the bevel gears **470, 494** on the counter **502** which counts the amount of money in the money box.

The machine is now at rest, ready for another operation.

*Phase "11"*

The nickel change set up clutch **472, 468** members are disengaged.

## DETAILED DESCRIPTION OF THE OPERATION OF THE MACHINE

The traveler enters the Long Island Railroad Station in New York city and wishes to proceed to Little Neck, Long Island. As he approaches the ticket machine, he notes that the fare to Little Neck, including tax, is 53 cents. He finds that in coins he has two half dollars which he inserts in the coin slot. The two coins pass through the usual slug rejecting mechanisms in the machine and successively enter chute **172**. As the coins pass down this chute, the first one actuates lever **169**, permitting the ratchet wheel assembly **154** to rotate one step which is 90°. The second coin likewise causes another one step rotation of the assembly **154**. This has resulted in the rotation of shaft **183** a distance of 120°

which is equal to twenty (20) five cent increments, and the amount of $1.00 on the periphery of the drum **255** will be aligned with the pointer **265** which will indicate to him that the amount of $1.00 has been accepted by the machine. The disc **203** representing Little Neck on the locking drum assembly **182** has, by the insertion of these coins, been rotated to a point where the cutout **206** is so positioned that he may depress the key **315** representing Little Neck and the plunger **270** may enter the cutout. The depressing of this key starts the operating cycle of the machine as follows:

The lateral tab **308** on the key stem **300** engages bail **388** rocking the sleeve shaft **382**. (The printing drum **1033** containing type slugs **1034** is arranged to move in either direction to avoid having to move almost a complete revolution to go from station 1 to station 60. Therefore, depressing any of the selector keys in the group 1 to 30 results in a clockwise rotation of the printing drum that would not exceed 180°, whereas depressing any of the selector keys in the group 31 to 60 results in a counter-clockwise rotation which likewise would not exceed 180°).

When rocking shaft **382** is partially rotated, the lever **387** depresses the connecting link **390** which operates the bell crank **936** which by means of the spring **938**, moves the motor bar **900** toward the left as in Figure 14. The notch **901** in the motor bar advances arm **910** stretching spring **914**. As this arm moves to the left it strikes locking arm **986** and swings it to the left so that the camming ear **986** thereon engages the depression in **960**. The camming ear **987** on the locking arm engages the tab **911** disengaging it from the notch **901** and before disengagement is effected, the lug at **910** drops in front of the top edge of mercury switch lever **877**.

As **910** is completely released from notch **901**, the spring **914** snaps **910** to the left as shown in Figure 36 and causes rotation of shaft **876**, thereby tipping mercury switch **887** and starting the motor. The shaft **825** is rotated by means of connecting rod **883**, pin **886**, lever **859**. The rotation of this shaft causes the movement of **831** in Figure 16 to advance contact pawl **840** to strike lever **842** and release the clutch arm **753** releasing clutch member so that its teeth **742** engage the clutch teeth **740**. The motor **735** starts driving the machine.

During the first part of the cycle, the crank disc **764**, Figure 17, starts rotating counter-clockwise and engages roller **869** on dog **867**, drawing curved bar **478** to the right. This bar **478** rocks shaft **476** by means of crank arm **477** which rotates crank **479** and lifts bar **482** to cause engagement of clutch members **472** and **468**. Crank **479** also lifts bar **510** operating lever **504** and causing bevel gears **494** and **470** to mesh. At this time the bar **510** latches to the crotch **519** of the bracket **520**. As the crank disc **764** in Figure 17 continues to rotate, the connecting rod **769** causes the gear member **780** to swing in a clockwise direction, rotating gear **779** and the shaft **776** through 190°. The shaft **776** is interconnected with shaft **775** and shaft **547**, as seen in Figure 15, hence they are, in effect, a single shaft. On the right end of shaft **547** is mounted gear **1365** which engages gear **1361** mounted on shaft **222**, Figure 22. The drive between **222** and **183** is effected by pulley **225** engaging the stud **217** on the arm **218**.

Mounted on shaft **183** is a toothed tube **200** carrying the sixty lock discs **205** with spacers and therebetween also gear **210** which engages gear **469** through idler gear **526**. As the operation of the machine continues tube **200**, together with the discs thereon, is rotated in a resetting direction which is clockwise as seen in Figure 14. When the reference edge **207** of the cutout portion **206** of the disc **205** comes in contact with key stem plunger **270**, tube **200** is arrested but shaft **183** and shaft **222** continue in motion for half of the machine cycle, the grooved pulley **225** is latched to gear **236** by means of pawl **229** engaging a tooth **231**. During this time spring **195** will wind in a direction to increase its tension, and stud **217** will move away from the reference edge **216** of arm **215**. While tube **200** was rotating, it caused the rotation of gear **449** and shaft **450**, **464**.

The rotation of shaft **450**, **464** resulted in rack **527** being raised to operate the counter **530** to record the amount of change given in nickels and/or quarters. It also caused the rotation of escapement ratchet wheel **635**. Escapement pawls **626** and **627** drop in behind the teeth **634** on ratchet wheel **635** to hold the latter against movement.

At 180° of the machine cycle the clutch members **468** and **472** are disengaged. A torsion spring **1089** mounted on shaft **464** now urges the shaft to rotate. In the beginning of this description, the traveler was said to have inserted two fifty cent coins to purchase a ticket priced at 53 cents, therefore, he should receive 47 cents in change. The tube **200** was rotated nine five cent increments before the reference edge **207** came in contact with the plunger **270**. Therefore, the shaft **464** was likewise rotated nine five cent increments.

When the selector key for Little Neck was first depressed, the lever **316** was pushed down by stud **309** on the key stem causing the opposite end of the lever **316** indicated as **321** on Figure 1 to rise within the zone through which bail **323** will move. As during the first half of the machine cycle, crank arm **782** in Figure 14 will operate bell crank **946** through bar **944**, and bell crank **946** will raise bar **370**, thereby operating crank arm **368**, partially rotating shaft **324**, causing bail **323** thereon to raise **321** and to operate the counter **337**, on the panel **335**, representing Little Neck, thereby recording the fact that one ticket has been issued for Little Neck. At the same time **321** picks up bail rod **326** on levers **325** which operate the pull rod **342** to add one in a total count or **338**, which records the total number of tickets sold.

Toward the end of the cycle, the stud **761** on worm gear **753**, Figure 15, contacts and moves the tab **871** on the right end of shaft **857** causing it and the sleeve member **860** thereon to rotate clockwise. Referring to Figure 14, when the sleeve is rotated approximately 60° clockwise, locking arm **986** is urged to the right by means of a spring and **986** comes over surface of the slot **861** as shown in Figure 15. The arm **862** attached to sleeve member **860** is also rotated clockwise carrying pawl **875** and causing the projecting lug on this pawl to come in front of tab **878** on dog **877**. Referring to Figure 36, toward the right end of shaft **857** but behind plate **726** is the arm **873** which engages the tab **906** and the motor bar **900** and pushes motor bar to the left as in Figure 36 or to the right as seen in Figure 12. Under the urge of spring **929** through bar **522**, motor bar locking member is rotated counter-clockwise, as seen in Figure 36, causing tab **931** to engage notch **939** on motor bar **900** locking the motor bar in the extreme reset position and stretching spring **938**, as shown in Figure 14.

Referring again to Figure 36, spring **941** is stretched when arm **873** is rotated counter-clockwise to reset motor bar. As stud **761** releases tab **871** the shaft **857** is thereby released and under the urge of spring **941** the shaft is rotated clockwise until arm **873** comes against stop pin. When shaft **857** is rotated clockwise as seen in Figure 36 or counter-clockwise as seen in Figure 14, the surface **861**, Figure 15, picks up **986**, Figure 14 raising bar **376**, moving crank arm **375** on bail shaft **372** carrying bail **371**. Figure 2 shows bail **371** locking the projection **304** on selector key stem down. As this bail is moved to unlock **304**, spring **938**, Figure 14, is held stretched, due to the fact that the tab **931** is still engaged with the notch **939** on the motor bar **900** holding the latter in an extreme right hand position as seen in Figure 14. When the key stem is released by bail **371**, the arm **965** is free to raise the bar **390** and operate crank arm **387**, rocking sleeve **382** and causing the portion **383** to lift the

tab 308 on key stem to restore the selector key to its normal position. Selector key is thereafter held in said position by spring 317, arm 316 of the bell crank 310 and stud 309.

When selector key 315 is so restored, the plunger 270, as seen in Figure 1, is withdrawn from the cutout 206 in the lock disc 205, thereby permitting spring 195 which is under tension to rotate tube 200 and gear 210 to their reset position. The rotation of gear 210 likewise causes the rotation of gear 469 and bevel gear 470 thereon which rotates the engaging beveled gear 494 to operate the counter 502. During that portion of the rotation of gear 210 in the early part of the cycle while set up of change was occurring, part of the sum deposited in the coin slot was registered in counter 502. Now then in the further operation of gear 210, additional entry into this counter of the amount that had been deposited in the coin slot which, in this instance, was $1.00, causes it to accumulate a record of the total sum accepted by the machine and deposited in the money box.

When gear 210 has been rotated to its normal or rest position, which is zero, the stud 950 on this gear, as shown in Figure 12, engages the tab 931 and moves the motor bar locking member 916, 932 and moves the lever 930. Referring to Figure 36, the movement of this member first released the latch on the motor bar 931, 939 permitting the motor bar to move approximately one-eighth inch so that the post 903 thereon, as shown in Figure 14, comes in contact with the arm 965 of bell crank 936. This one-eighth inch movement of the motor bar prevents a relatching at 931, 939 when money is again deposited in the coin slot, and stud 950 permits the lateral arm 930 to move counter-clockwise, as shown in Figure 36. When this arm was moved clockwise it moved bar 522 to the left, causing stud 523 to move bar 519 out of engagement with the crotch 519, Figure 14, thereby resulting in the disengagement of bevel gear 494 from 470.

Latch 931, 939, as shown in Figure 36, has another important safety feature. Should there be any failure to reset the machine or to restore the locking drum 182, 931 and 939 will remain latched and the machine cannot again be operated until after adjustment by a service man. This latch also serves as protection in the case of an attempted fraud as follows:

For example, if vendee had deposited a sum sufficient to operate a selector key for say an 85 cent ticket, and while the machine was operating the vendee (assuming he had some knowledge of mechanics and wished to defraud the machine by taking advantage of the inertia of relocking) by pressing hard on another selector key of say 70 cents when toward the end of the cycle the original key for 85 cents would be released. In this instance the key he is pressing for 70 cents would immediately release and operate. However, because the motor bar remains latched at 931, 939, the machine would not go through a second cycle and he would not obtain a second ticket or any additional change. In fact, no harm whatever would be done, and when he became tired of holding the 70 cent key and released it, the locking drum would then restore as previously described under the urge of its internal spring 195 and complete the operation of the machine as described.

When a selector key has been depressed, any key in the group 1 to 30 presses down the bar 390 on the bottom of which is a projection 390*a* which contacts a stud 957 (Figure 14) which causes the rocking dog 955 to rotate to the left, moving bar 960 which moves lever 800 to cause clutch tooth 819 to engage at 974. If a selector key 31 to 60 is depressed then bar 386 is pushed downward, the projection 386*a* thereon contacts pin 956 and causes the rocking dog 955 to rotate to the right, effecting the engagement of clutch tooth 818 with 791.

If in the first instance a selector key 1 to 30 has been operated and the next selector key operated also is in the group 1 to 30, then there is no movement of 955 and the associated clutches. They stay engaged until such time as a key in the alternative group is operated. 791 is welded to gear 789, and likewise 793 is welded to gear 790. These two companion gears are free on shaft 792. Clutch member 795 is keyed to the shaft by pin 803; therefore, the pinion 790 will drive shaft 792 in one direction when the clutch member 819 is engaged with 793. Likewise, pinion 789 will drive shaft 792 in the opposite direction if clutch 818 is engaged with 791. The beveled gear 785, with which the pinions 789 and 790 are meshed, is driven by a spring 815, Figure 15, one end of which is anchored to gear member 780 and the other end of which is connected to the hub of gear 785. When the machine is operated, the rotation of beveled gear 785 is counter-clockwise, as seen in Figure 14, and will drive pinion 790, shaft 792 and sprocket 805 thereon also in a counter-clockwise direction, as seen in Figure 14, or a clockwise direction, as seen in Figure 19.

If the clutch 818 is engaged with 791, by the depression of a selector key in the group 31 to 60, the shaft 792 and the sprocket 805 are driven in a counter-clockwise direction, as seen in Figure 19, moving the chain 295 and the engaging member 293 thereon toward the left, until the member 293 is arrested by a tab 302 on a depressed key in the group 31 to 60. In Figure 19 a depressed key 31 shown in dotted lines, and the member 293 arrested thereby is also shown in dotted lines. Now, since the chain 295 also drives the sprocket 806 and the printing wheel 1025, which are both on shaft 1022, so the arresting of the chain by the engagement of the engaging member 293 with the tab on the stem of the depressed key also arrests the printing wheel in a position to print the name of the destination represented by the depressed key.

Returning to the description of the operation, the key representing Little Neck was assumed to be key #30, and the depression of that key caused the chain 295, and the engaging members 293 and 294 thereon, to move toward the right, as seen in Figure 19, until the engaging member 294 is arrested by the tab 302 on the depressed key.

Referring for the moment to Figure 2, the rotation of sprocket 805 has caused the rotation of the printing wheel 1033, and when 294 is arrested as described, the type slug 1034 representing the station to be printed as of the thirtieth selector key will be at rest in position to print. The spring 815 thereafter will stretch until the machine completes half of the cycle. As the worm gear 758 and the shafts 757 and 1000 rotate, the beveled gears 1001, 1003 drive the Geneva movement 1005, 1114 (Figure 18) which operates the crank 1007 associated with mutilated pinion 1014 through connecting rod 1009 and lever 1011, 1280 to move printing pad carriage in one direction in one machine cycle, and in the opposite direction in the next cycle repetitively.

A carbon paper tape is positioned between the ticket stock and the type slug, and the movement of this printing pad carriage rocks the printing pad over the rear face of the ticket stock and thereby effects printing. Further rotation of shaft 1000 causes Geneva movement 1082, 1084 to drive shaft 1088, as seen in Figure 33, which feeds the ticket, through the medium of a knurled wheel 1100 and its matching knurled wheel 1101. The perimeter of the knurled wheel 1100 exceeds the length of the ticket by 3/32 inch so that the ticket stock is fed out 3/32 inch beyond a point where it will cut off. Then the roller 1143, as seen in Figure 22, drops into a notch in the detent disc 1102 to index the ticket exactly at the cutoff point after the knurled wheel 1100 has discontinued feeding and released the ticket. When the printing pad carrier reaches the end of its stroke in either direction, a lateral stud thereon 1278 engages the ledge 1162, lifting mask plate 1160 and the ticket and the carbon free from the printing wheel and type.

When the printing pad carriage was actuated, it caused

printing of the code 1212 via the aperture 1157, the date via the aperture 1159 and the station of destination via aperture 1158. Incidentally, the code is printed on the succeeding ticket at the same time the date and station of destination is printed on the ticket to be issued. While printing was occurring, the rotation of shaft 1000 also rotated cam 1080 to depress the knife actuating the lever 1070 and thereby raise the ticket shearing blade 1194 from engagement with its mating shear 1193. Shortly after the ticket feeding has been completed, cam 1080 reaches a point where the roller 1078 drops suddenly, thereby permitting a chopping or shearing action between the blades 1193 and 1194 to cut a ticket from the ticket strip, leaving the succeeding ticket, with the code printed thereon, at rest in the printing position.

During the second half cycle of the machine, while ticket feeding, etc. are occurring, the gear 735 and sprocket 805 have reversed their direction restoring the printing wheel to its at rest position and moving the engaging members 293 and 294 on the chain 295 to their normal at rest positions.

Referring to Figure 14, a spring 1579 is connected to the bar 376 and to the plate and urges the bar toward the right.

Referring to Figure 33, cam 1080 has an elongated slot 1580 formed in its hub 1081 and a pin 1581 is mounted in the shaft 1000 and extends into said slot so that during one phase of the revolution of the cam, it can be suddenly displaced. The function of this slot is as follows: As the cam rotates in a counter-clockwise direction, as seen in Figure 33, it raises the roller 1078 and, consequently, the end of the lever 1076 which carries the roller, and the lever acts against the shear actuating lever 1070. The lever 1070, in turn, acts against the roller 1182 and as the roller 1077 is advanced higher and higher by the surface of the cam, rectangular frame 1180 is raised, thereby compressing the powerful springs 1191 and 1192. As the apex of the cam 1080 reaches the roller 1077, the roller drops off, toward the axis 1000 and the cam is over driven thereby a distance limited by the slot 1580, with the result that the roller is free to fall on to the lower surface of the cam, and the movable knife member carried in frame 1180 is dropped with a snap thereby the ticket is cut off from the ticket stock substantially instantaneously.

Referring to Figure 17, a pair of contact arms 1533 and 1534 are positioned in the path of the upper end of the connecting rod 769 and the lower contact arm 1534 carries a buffer which is engaged and held into engagement with the contact arm 1533 by said upper end of the connecting rod 769 which is "at rest" position of the connecting rod 769; therefore, the contact arms 1533 and 1534 are held in contact with each other at all times that the machine is not being operated.

Referring to Figure 44, a prospective view of the machine is shown to indicate the location of the selector key bank 315, the coin slot 1524, the window 265 through which the rim of the drum 255 may be seen and the coin return button 1488. Figure 44 also shows the cup or depression 1582 which receives the ticket together with the change (if any) and which also receives the coins placed in the machine by the vendee and returned to him by the pressing in of the coin return button 1488.

Figure 45 shows a ticket upon which is printed the code or number of the machine, the name of the destination and the date. The code or machine number, by the printing mechanism disclosed herein, is impressed upon the succeeding ticket thereby shortening the range of and the relation of the several legends relative to each other.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation.

What is claimed is:

1. In a ticket vending machine, a printing wheel carrying a plurality of type element groups each having a different price, a printing stage, a plurality of normally locked releasable keys each corresponding to a different one of said groups and representing the same price as its corresponding group, said keys being arranged in two banks adjacent to each other, a first bail cooperating with the keys in one of said banks, a second bail cooperating with the keys in the other of said banks, driving means for said printing wheel including reversible mechanism controlled by said bails and set to rotate said wheel a fraction of a revolution in one direction when a key in one of said banks is depressed and its bail is actuated, and set to rotate said wheel a fraction of a revolution in the opposite direction when a key in the other of said banks is depressed; means moving in time with the movement of said wheel and carrying a first engageable means adapted to be arrested by any depressed key in said first bank when said wheel is moving in said first direction for arresting the type element group, corresponding to the depressed key, at said printing stage; said last means also carrying a second engageable means adapted to be arrested by any depressed key in said second bank when said wheel is moving in said opposite direction for arresting a type element group, corresponding to the depressed key, at said printing stage; means to effect a printing operation upon a ticket in said stage, and means to deliver the printed ticket from said machine.

2. In a ticket printing machine, a printing wheel having a plurality of groups of type characters thereon, a printing station, a bank of selector keys for selecting one of said groups for printing, a bail in cooperative relation with the keys in at least one portion of said bank, a second bail in cooperation with the keys in another portion of said bank, driving mechanism for rotating said printing wheel, said driving mechanism including reversible clutch means, linkages between said first bail and said clutch means for effecting the rotation of said printing wheel in one direction, linkages between said second bail and said clutch for effecting the rotation of said printing wheel in the opposite direction, means controlled by a displaced selector key for arresting said printing wheel with the type group corresponding to the selector key displaced at said stage, a supply of ticket stock, and means to intermittently feed said stock through said stage, and means to print on said stock from the type group selected while said stock is at rest.

3. In a ticket printing machine, a printing stage for supporting ticket stock and a strip of impression material, said stage being movable from a normal position to a printing position and back to said normal position, separate individual means for intermittently feeding said stock and said material through said printing stage in the same direction, a printing element adjacent to said impression material in said printing stage and carrying a plurality of groups of characters, means to move said element in a direction angular with respect to the movement of said stock to arrest a desired group of characters at said stage, means to lower said stage to a printing position after the arrest of said element, a printing pad carriage movable on a path tangent to said stock in said printing stage after the latter has been lowered as aforesaid, means to move said carriage to effect a printing operation on said stock, means to raise said stage from the plane of movement of said printing element after said printing operation, means to sever the portion printed upon from the remainder of said stock, and means to deliver said portion outside said machine.

4. In a coin controlled vending machine, a roll of ticket stock, a plurality of selector keys each representing a different destination, means locking all said keys against movement and adapted to sequentially release said keys in accordance with a desired destination so that a key representing said wanted destination may be depressed, a rotary printing wheel carrying a plurality of names of destinations peripherally, a printing stage traversed by the periphery of said wheel, means to feed said ticket stock through said stage, motor driven mechanism operatively connected to said print-wheel and controlled by a depressed key for moving said wheel relative to said printing stage, said connection carrying engageable means adapted to be arrested by a depressed key for arresting said printing wheel with the corresponding name of the destination at said printing stage, means to print said selected destination on said stock after said wheel has been so arrested, means to sever the printed portion from said stock, and means to deliver the severed portion outside said machine.

5. A ticket vending machine according to claim 4 wherein said rotary printing wheel has a plurality of slots formed therein, said slots having their axes parallel to the axis of said wheel and all of said slots communicating with the outer periphery of said wheel, and a plurality of slugs detachably mounted in said slots and bearing types for printing the names of said different destinations.

6. A vending machine according to claim 4 in which said printing stage includes a mask plate having a rectangular opening which registers with the arrested slug at said stage and through which the names of the destinations carried by the slugs are printed on the ticket stock, said plate being a second rectangular opening adjacent to said first rectangular opening through which the date is printed, and said plate having a third opening adjacent to said second opening through which an identification symbol is printed, said plate also carrying a camming ledge and means to engage said ledge for maintaining said printing stage out of the range of said printing wheel during the time said printing wheel is being rotated, other means normally tending to urge said mask plate toward said stage by acting against the restraint of said means to engage said ledge, said means to engage being adapted to disengage said ledge as said wheel comes to rest and thereby effect the lowering of said plate to a printing position closely adjacent to the slug on said wheel bearing the selected destination.

7. In a vending machine, a bank of selector keys, each being adapted to function as an interposer when depressed and each representing a different item, means under control of a vender to unlock a desired selector key so that the latter may be depressed, a positionable member carrying a plurality of selectable printing means, a printing stage, driven means and means to drive the same, said driven means being operatively connected to said member and traversing a path adjacent to said selector keys, and tab means on said driven means, adapted to be arrested by a displaced selector key with the selected printing means at said stage, feed means to deliver strip material to said stage, and means to effect an impression on said material by the printing means at said stage.

8. In a vending machine, a plurality of selector keys arranged in a bank, each being adapted to act as an arrestor, a printing stage, a movable printing member peripherally carrying a plurality of grouped printing elements, driven means and means to drive the same, said driven means being operatively connected to said printing member movable therewith and having at least a portion thereof traversing a path adjacent to said bank and carrying tab means adapted to be intercepted by any displaced selector key, whereby said printing member is arrested with a selected one of said grouped printing elements in registration with said stage, and means to take an impression from said last grouped printing elements.

9. In a dispensing device, a printing stage, a printing wheel adjacent to said stage and having a plurality of different set ups thereon, each adapted to be brought into registration with said stage, a plurality of selector keys remote from said wheel and each representing a different set up and each adapted to act as a stop when displaced, to arrest said printing wheel with a different set up at said printing stage, movable means operatively connected to said printing wheel, said means moving along a path adjacent to and adapted to be arrested by a displaced selector with a corresponding setup at rest in registration with said printing stage, means to take an impression on a strip at said stage, and means to deliver the then impressed strip.

10. In a dispensing machine, a printing wheel having a plurality of different type element groups detachably mounted thereon, a printing stage traversed by the periphery of said printing wheel, power means movable along a fixed path and carrying engageable means, strip means to be printed, means to move said strip means through said printing stage a plurality of selector keys adjacent to said path, each representing a different one of said groups and each adapted to be selectively displaced, engageable means on said power means adapted to be arrested by a displaced one of said selector keys for positioning a selected type element group in cooperative relation with said strip means, means to effect a printing operation, and means to dispense said printed strip means.

11. In a dispensing machine, a printing wheel carrying a plurality of different type element groups representing destinations, a printing stage traversed by the periphery of said printing wheel, a strip to be printed on, means to move said strip through said printing stage in steps, a group of selector keys adapted to be individually displaced for selecting any one of said groups for printing, driving means operatively connected to said wheel, said driving means including a drive chain carrying tab means traversing a path adjacent to said group of selector keys and adapted to be arrested by a displaced selector key with the selected group in registration with said stage, means to take an impression of the selected group on said strip, and means to dispense said strip.

12. In a ticket vending machine, a printing wheel carrying a plurality of different type element groups on its periphery, a printing stage, means to rotate said wheel and cause its periphery to traverse said stage, said last means carrying engageable means moving along a fixed path, a plurality of releasable selector keys each having a stem and each corresponding to a different one of said groups and adapted to be selectively depressed by a vender driving, means set into operation by a depressed key for actuating said means to rotate and moving said wheel and for arresting said wheel when the element group corresponding to said depressed key is in registration with said stage, means to deliver ticket material to said printing stage, means to effect a printing operation upon a ticket in said stage, and means to deliver the printed ticket from said machine.

13. In a ticket vending machine, a printing wheel carrying a plurality of different printable element groups on the periphery thereof, a printing stage traversed by said groups, a bank of selector keys each corresponding to a different group, said keys being normally locked and selectively releasable, motor driven mechanism and controls therefor operatively connected to said wheel and set in motion by the depression of one of said keys for rotating said wheel and for arresting it with the group corresponding to the depressed key in registration with said stage, said mechanism including a flexible driving member a portion of which traverses a path adjacent to said bank and carrying tabs adapted to be intercepted by a depressed key, means to print a ticket from the selected group arrested at said stage, means to deliver the printed ticket from said machine, and means to reset said mechanism after said ticket has been printed and delivered.

14. In a ticket vending machine, a plurality of different type element groups on a movable carrier, a printing stage and means to feed ticket stock therethrough, said stage being traversed by said groups, a plurality of selector keys disposed along a path traversed by said carrier and each corresponding to a different group and adapted to be selectively depressed by a vender, mechanism for moving said carrier upon the depression of a key and including flexible driving means and having tab means engageable thereon adapted to be arrested by a depressed key when the type element group corresponding to said depressed key is at said printing stage, means to take an impression on said stock from said last-mentioned group, thereby forming a ticket, and means to sever said ticket from the stock and deliver it from said machine.

15. In a ticket vending machine, a plurality of different type element groups on a carrier, each group representing a different destination, a printing stage traversed by said groups and means to feed ticket stock therethrough, a plurality of selector keys arranged in a bank each adapted to be selectively depressed by a vender, mechanism operatively connected to said carrier for moving said carrier and having engageable means thereon coextensive with and adjacent to said bank, said carrier being adapted to be arrested by a depressed key with the type element group corresponding to said depressed key positioned at said printing stage, means to take an impression from said last mentioned group, thereby forming a ticket, means to sever said ticket from said stock, and means to deliver the formed ticket from said machine.

16. In a dispensing machine, in combination, a plurality of different selector keys each representing a different destination and each having a lock normally locking said keys and adapted to be selectively moved to sequentially unlock at least some of said keys so that a key corresponding to a wanted destination may be depressed, said keys being arranged in banks in accordance with a desired order, a rotary printing wheel carrying a plurality of legends each represented by a different one of said keys and arranged on the periphery thereof in an order corresponding to that of said keys, a printing stage and means to feed ticket stock therethrough, mechanism for moving said printing wheel relative to said printing stage to cause said legends to traverse it and having driving means thereon and control means therefor, said driving means carrying engageable means adapted to be arrested by a depressed key for positioning the corresponding legend at said printing stage, means to print said legend on said



stock, means to advance said stock after printing, means to sever the printed ticket therefrom, and means to deliver said ticket outside said machine.

17. In a coin controlled vending machine, a ticket printing stage, a wheel carrying type slugs representing different words on the periphery thereof, the latter of which traverses said printing stage as said wheel is rotated, apparatus for rotating said wheel in either direction including a flexible power transmitting element moving through a zone in said machine, a plurality of selector keys arranged in two groups, a first bail common to the keys in one group, a second bail common to the keys in the other group, reversing means in said apparatus for rotating said wheel and cooperating with said bails, whereby said first bail causes said wheel to rotate in one direction when a key in said one group is depressed and said second bail causes said wheel to rotate in the opposite direction when a key in said other group is depressed, engageable means on said transmitting element to be arrested by a depressed key in one group when its bail causes said wheel to rotate in one direction and a second engageable means on said element to be arrested by a depressed key in said other group when its bail causes said wheel to rotate in the opposite direction, a strip at said printing stage, means to effect a printing operation, and means to sever a printed portion of said strip and deliver it outside said machine.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 389,667 | Robinson | Sept. 18, 1888 |
| 814,985 | Piscicelli | Mar. 13, 1906 |
| 820,277 | Wills | May 8, 1906 |
| 899,671 | Lebeis | Sept. 29, 1908 |
| 992,461 | Vandercock | May 16, 1911 |
| 1,215,862 | Richardson | Feb. 13, 1917 |
| 1,307,603 | Skerl | June 24, 1919 |
| 1,768,917 | McCain | July 1, 1930 |
| 1,962,640 | Fell | June 12, 1934 |
| 1,997,137 | Florance | Apr. 9, 1935 |
| 2,026,763 | Webb | Jan. 7, 1936 |
| 2,279,664 | Du Grenier | Apr. 14, 1942 |
| 2,295,748 | Moore | Sept. 15, 1942 |
| 2,506,337 | Boyden | May 2, 1950 |
| 2,526,512 | Snell | Oct. 17, 1950 |
| 2,609,746 | Helsel | Sept. 9, 1952 |