Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 1

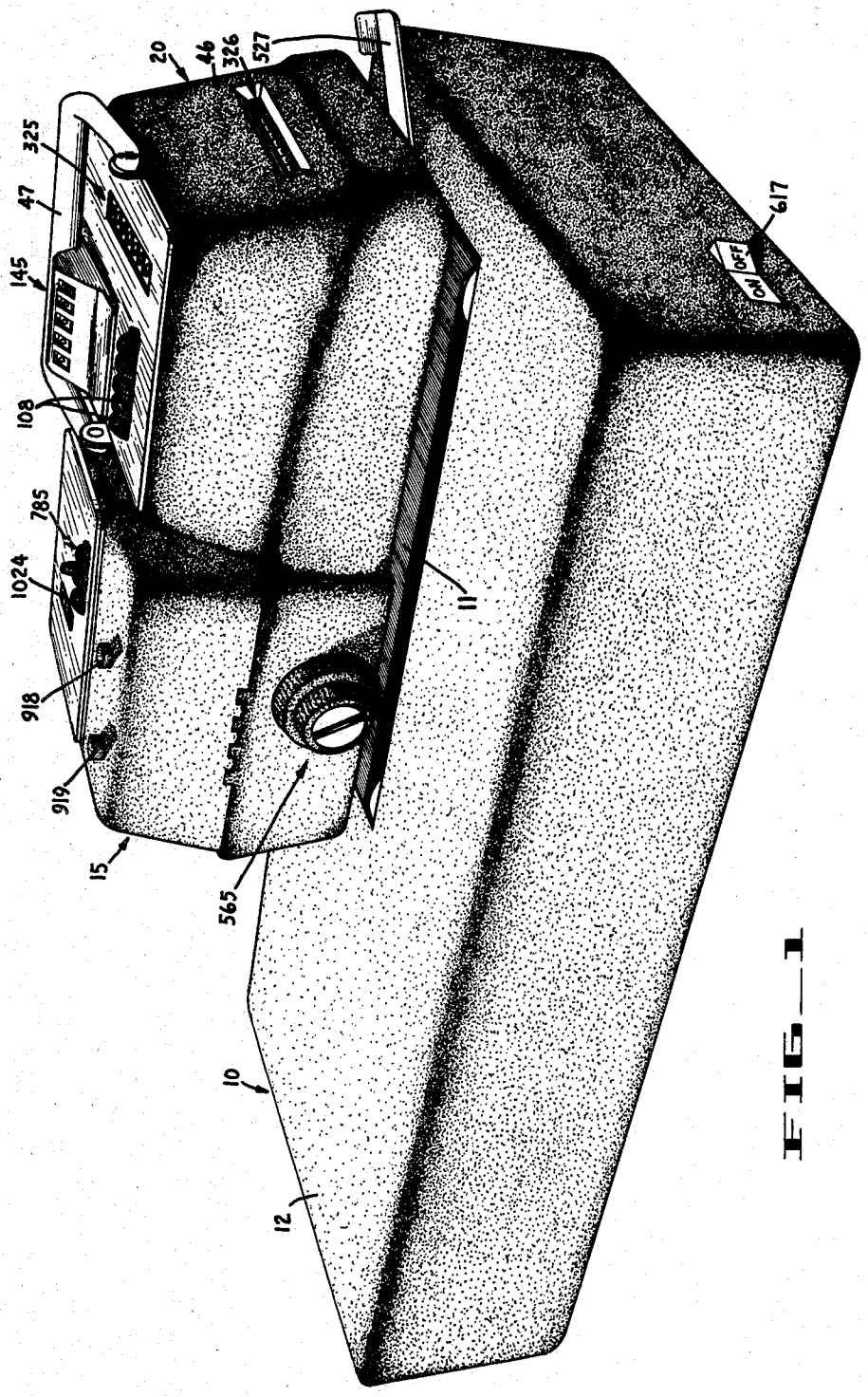


FIG. 1

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 2

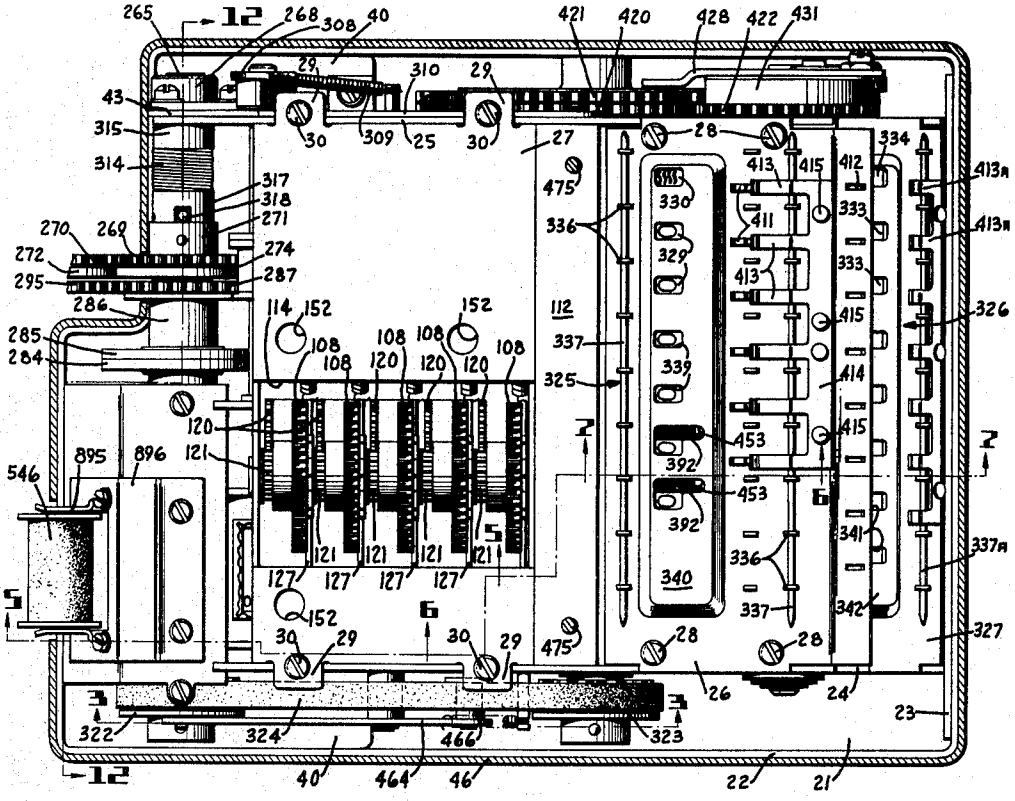


FIG_2

FIG_3

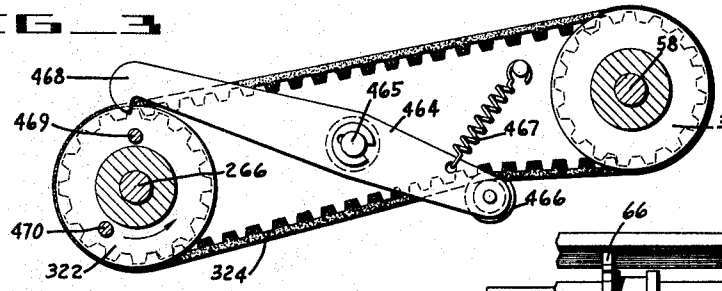
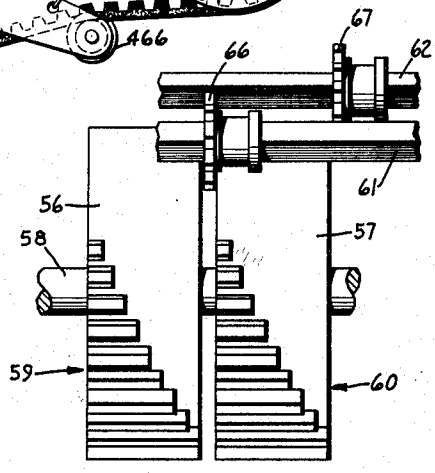


FIG_4



Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 3

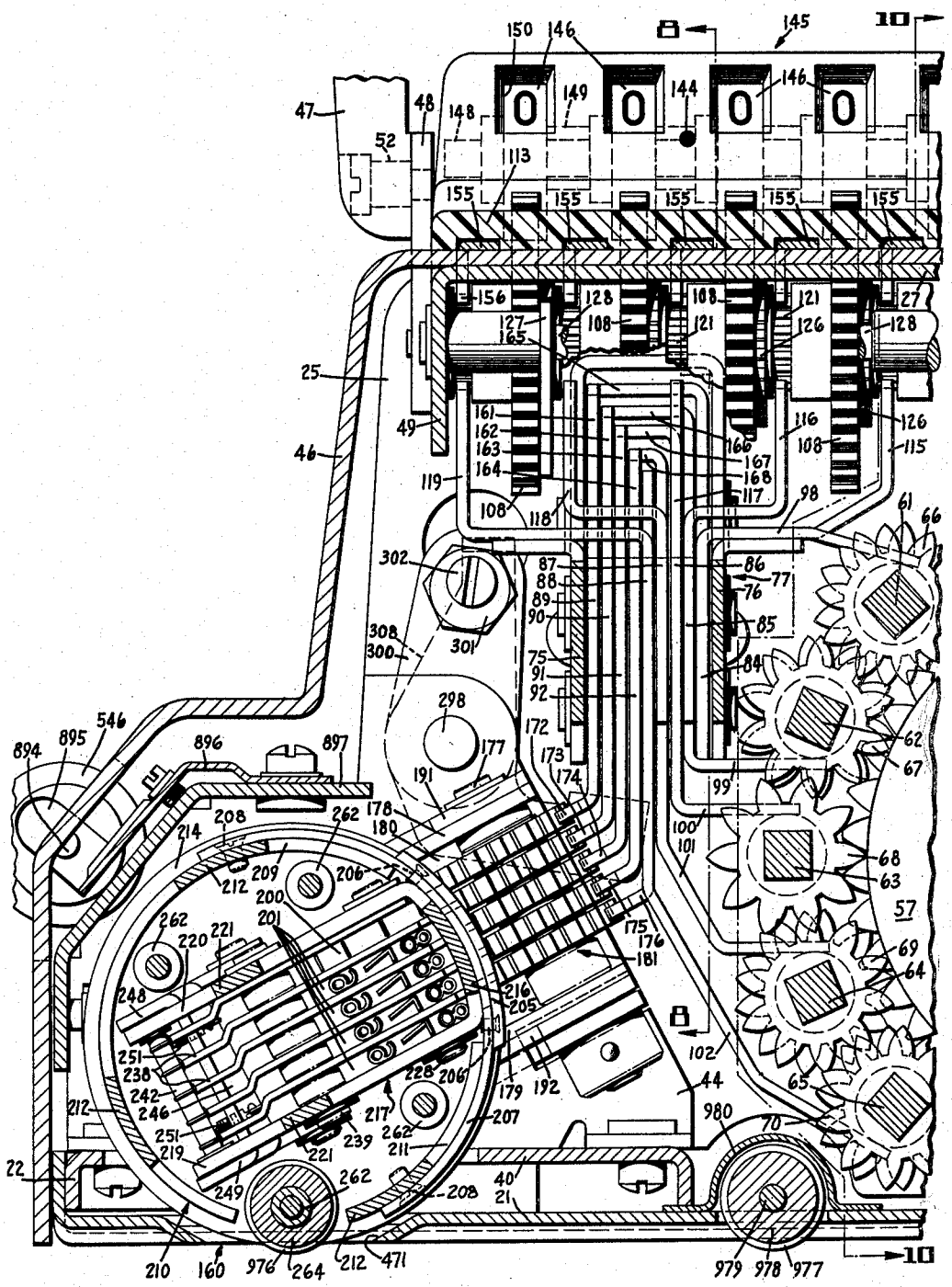


FIG_5

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 4

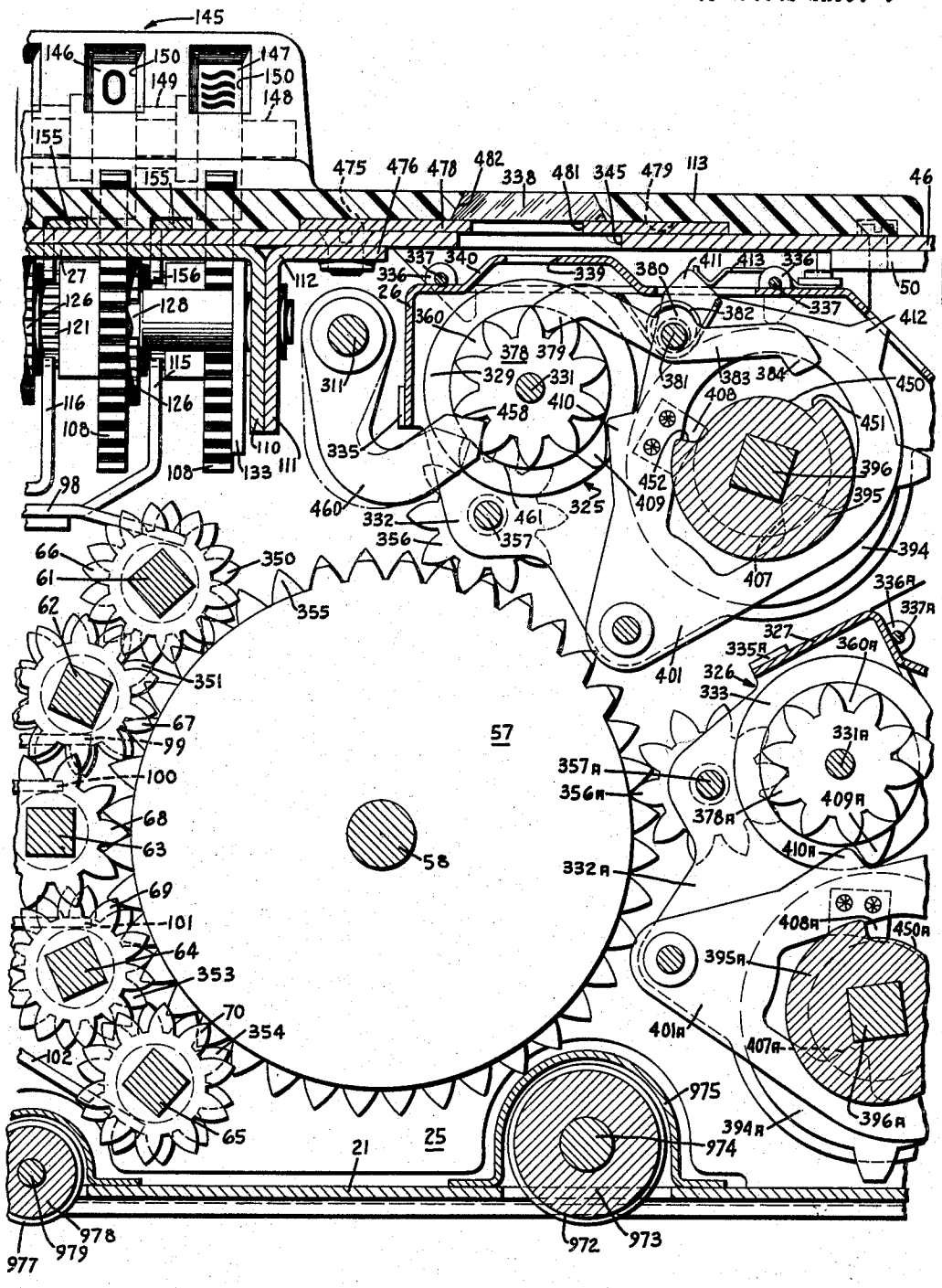


FIG_6

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 5

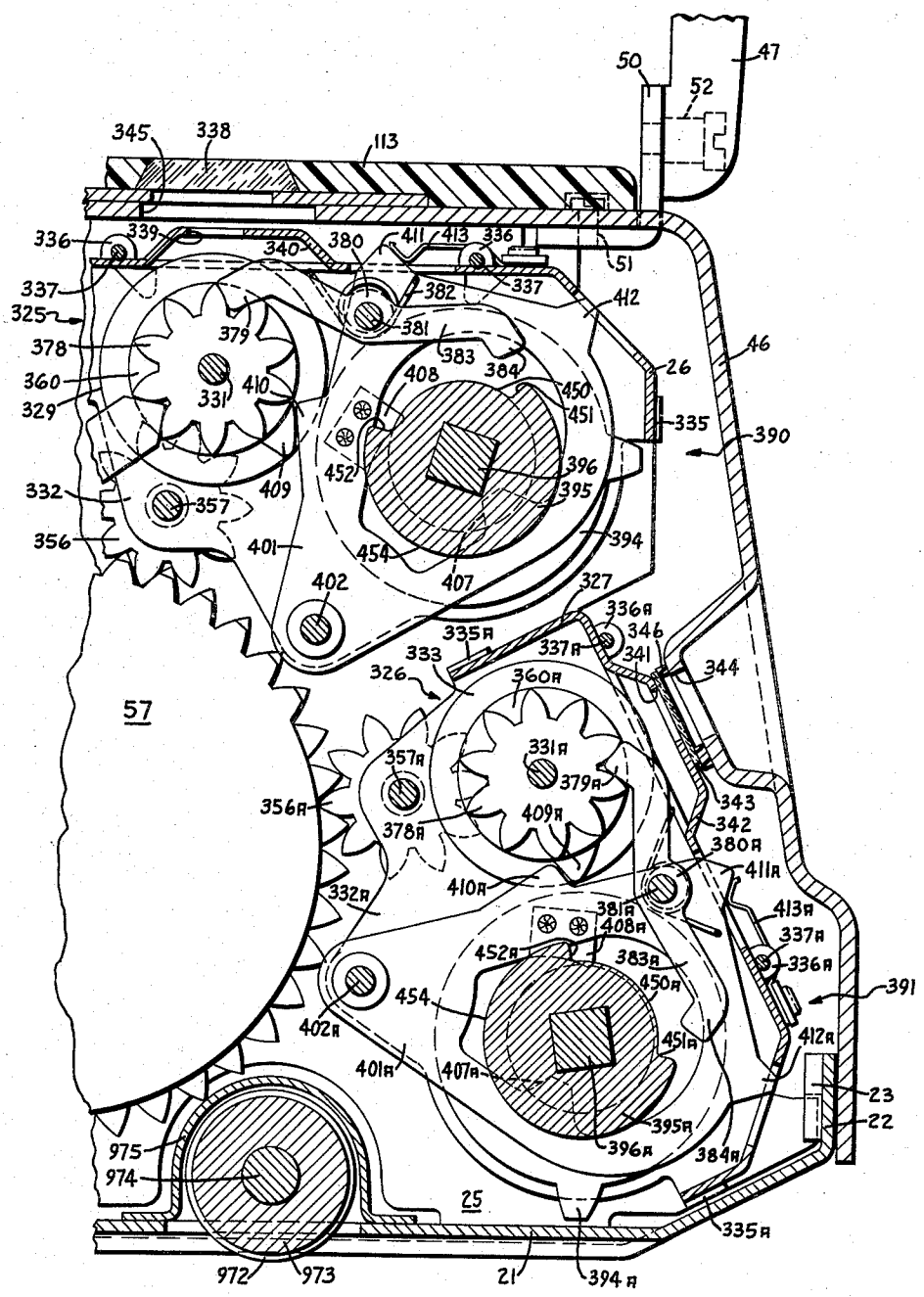


FIG_2

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 6

FIG_8

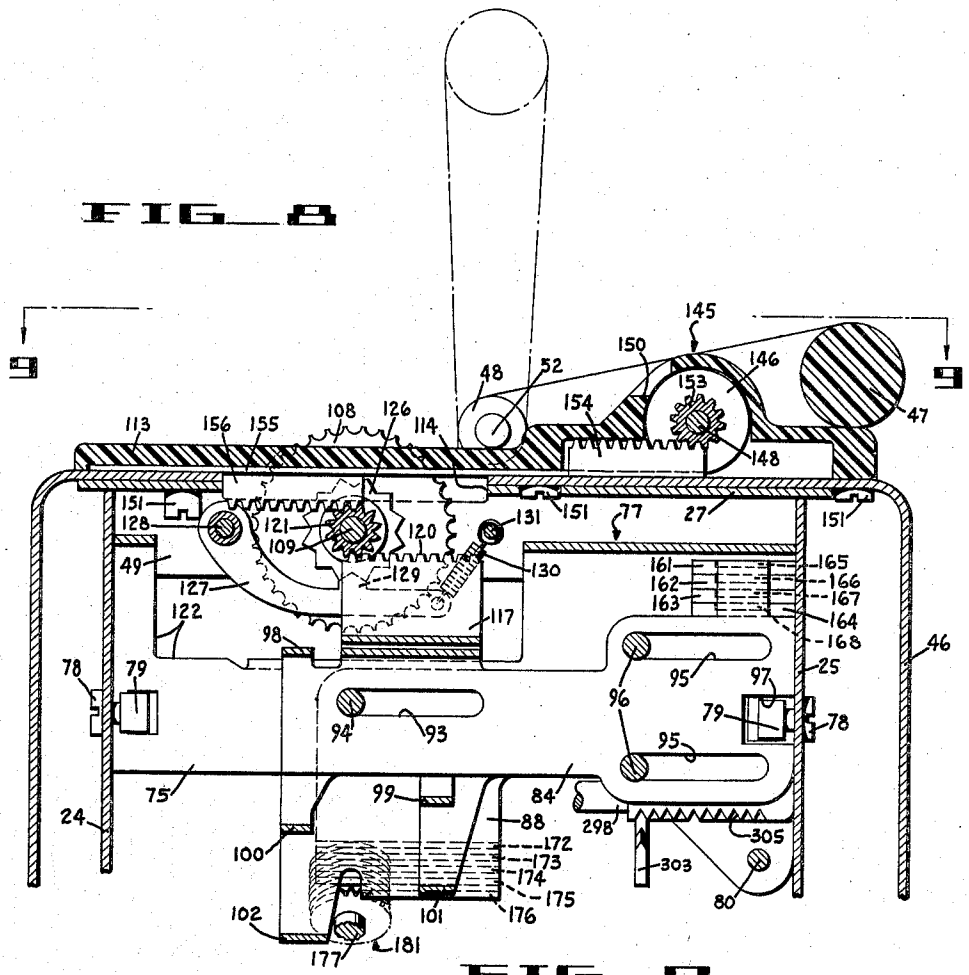
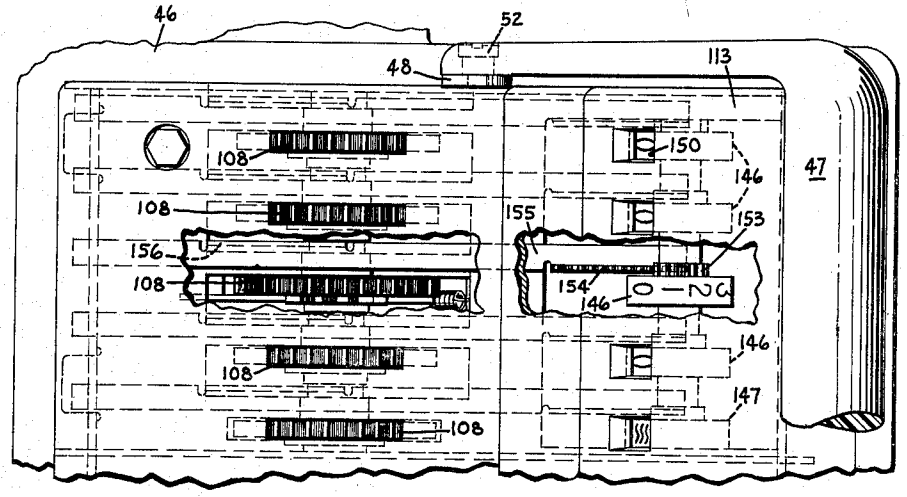


FIG_9



Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 7

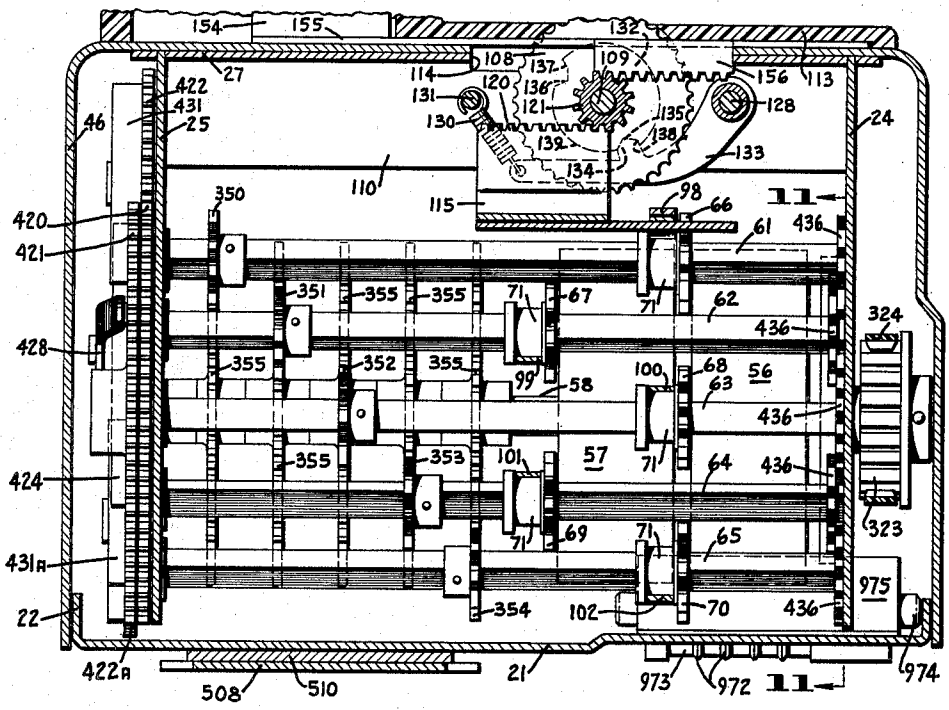


FIG. 10

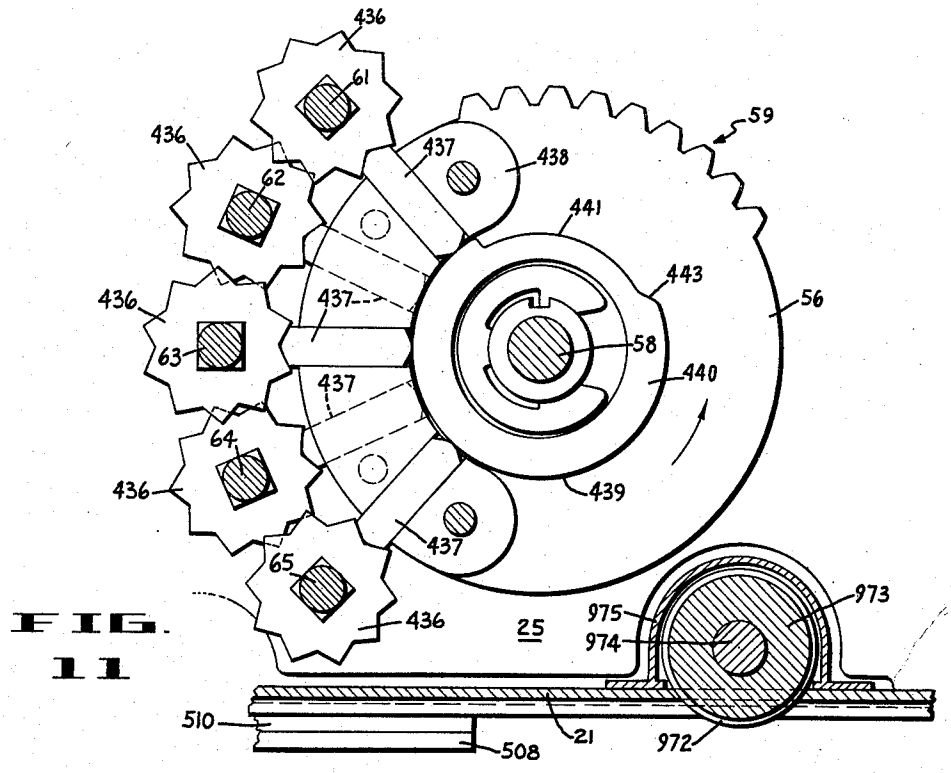


FIG. 11

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 8

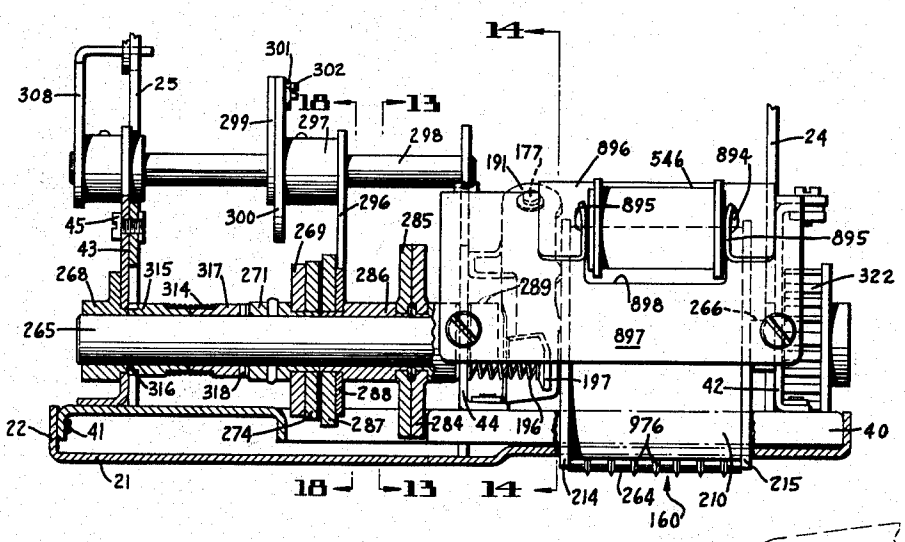


FIG_12

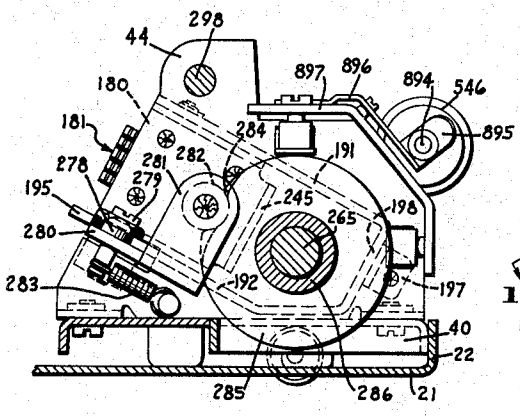


FIG_13

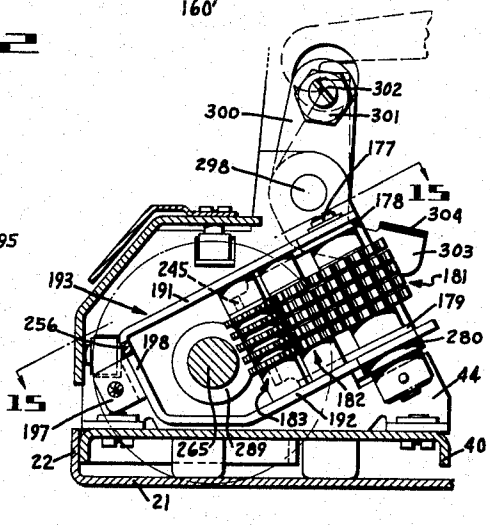


FIG_14

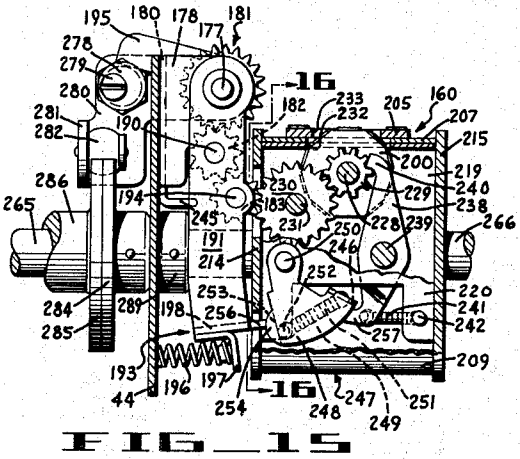


FIG_15

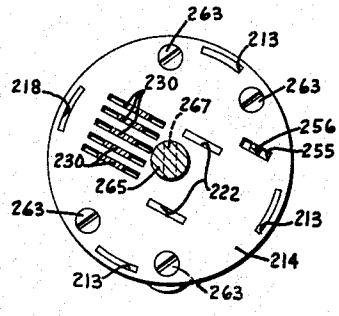


FIG_16

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 9

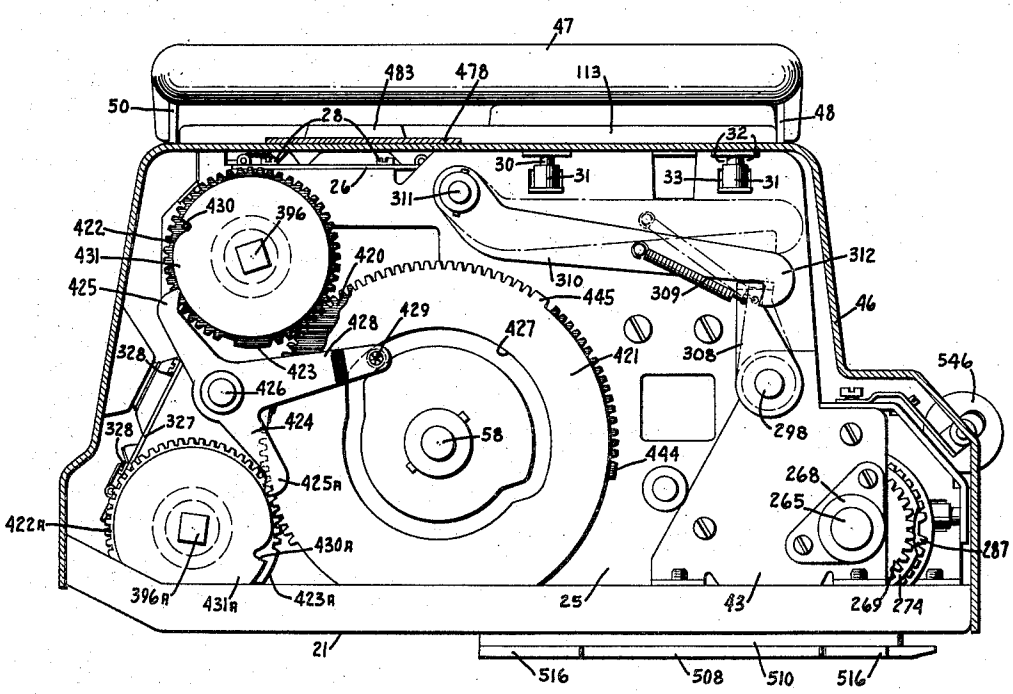


FIG_17

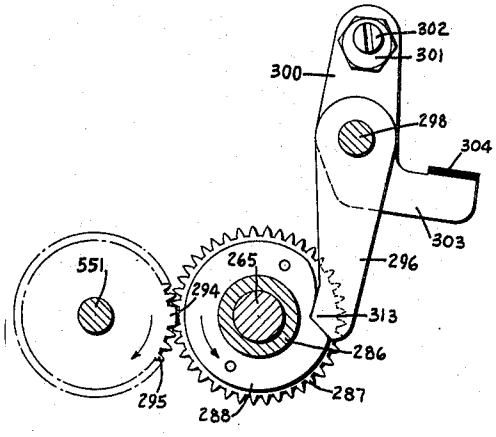


FIG_18

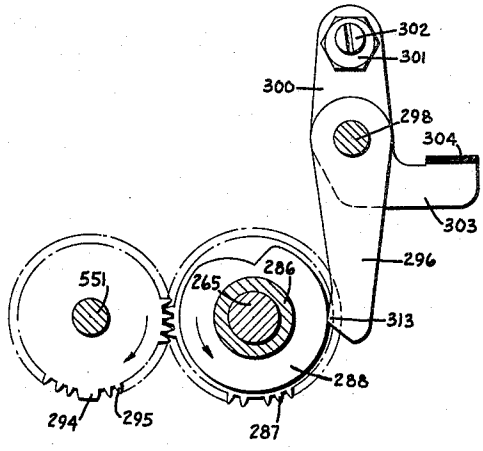


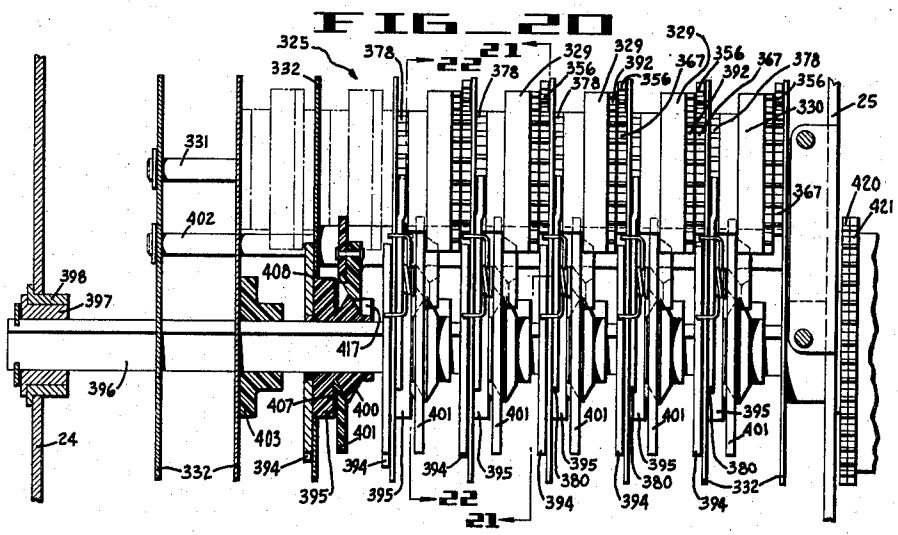
FIG_19

Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

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FIG_20



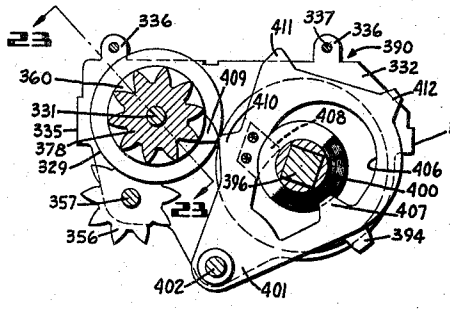


FIG_22

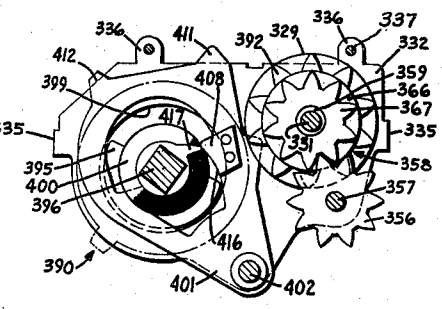


FIG_21

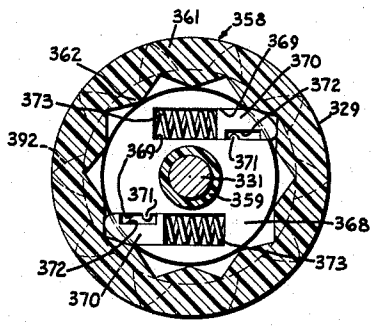


FIG_24

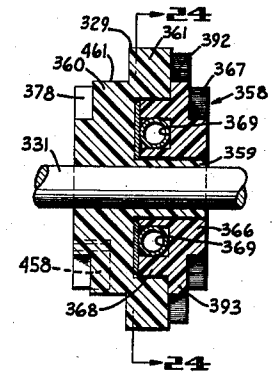


FIG_23

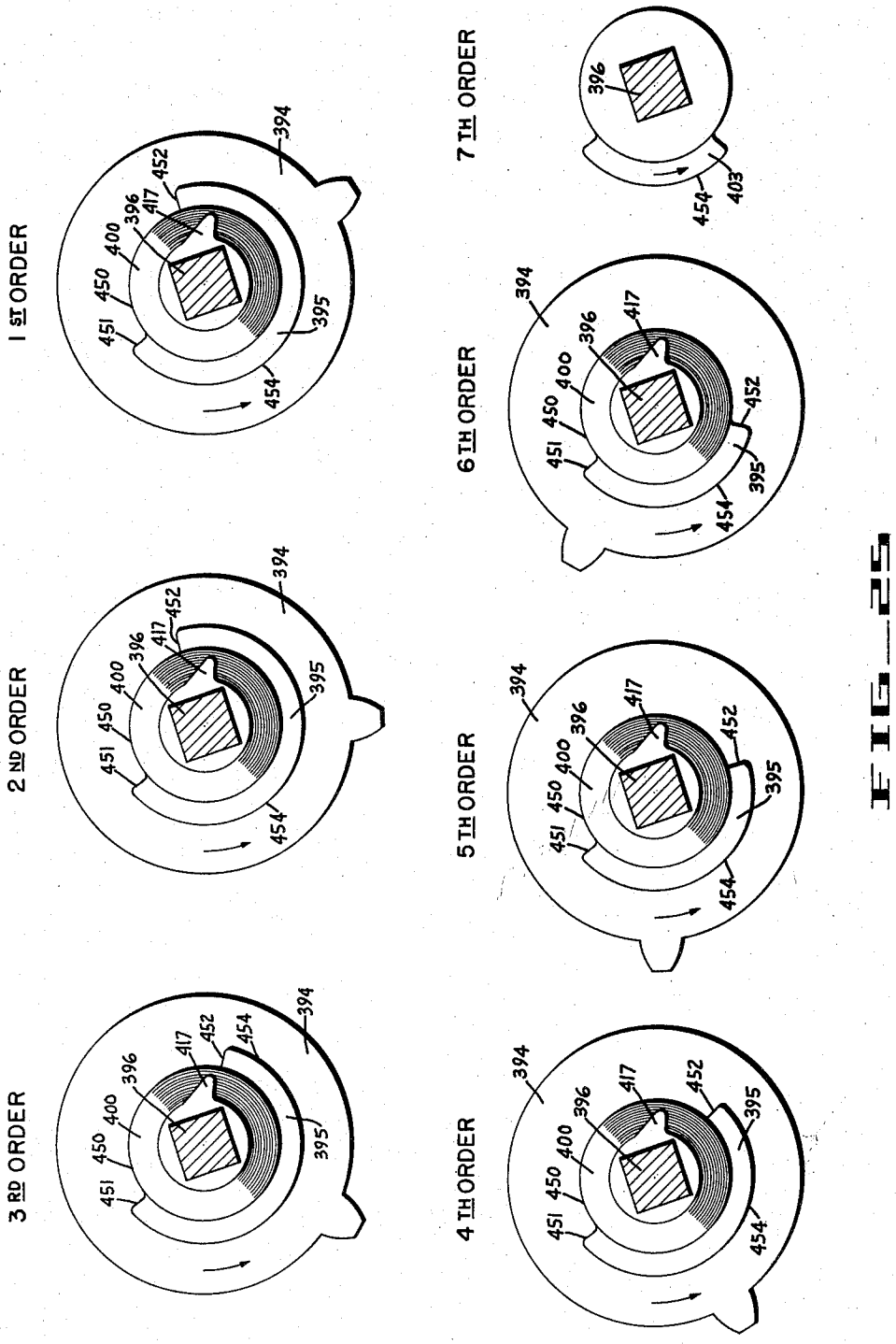

1 ST ORDER
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FIG-25

FIG_26

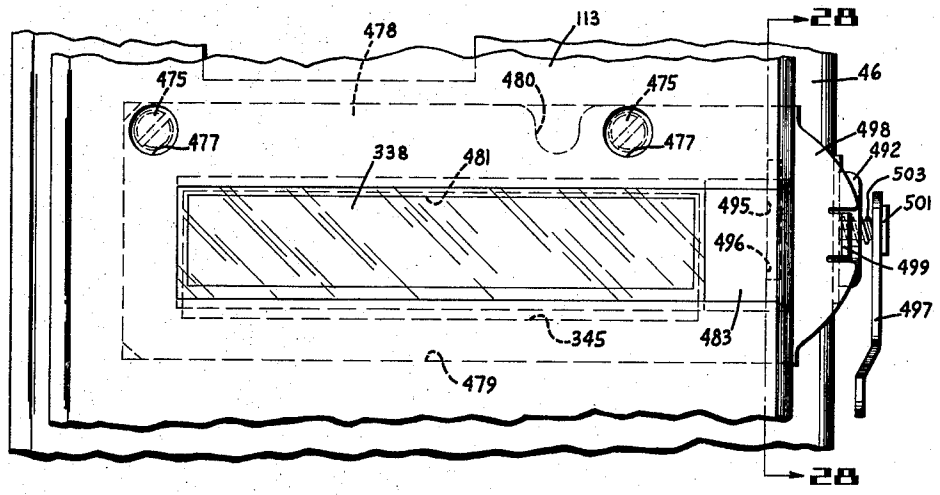


FIG_27

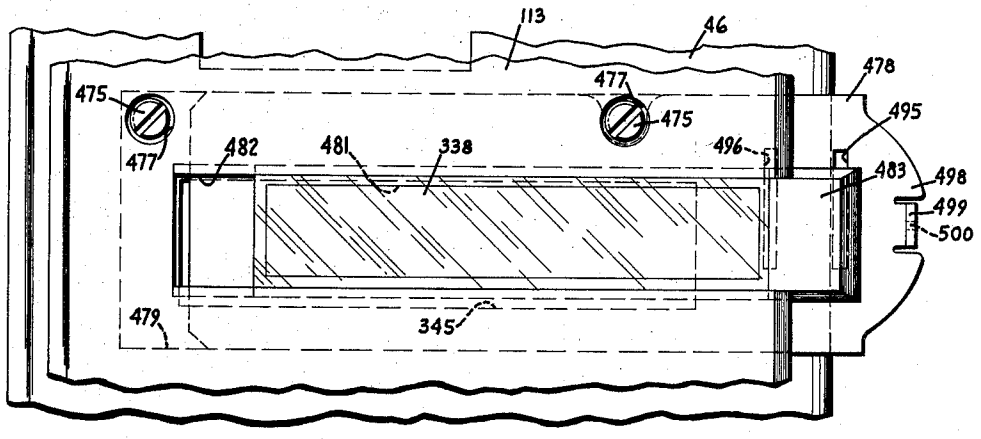


FIG_28

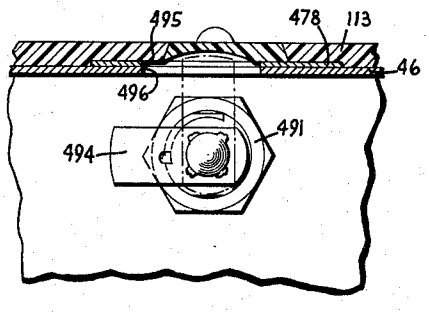


FIG_29

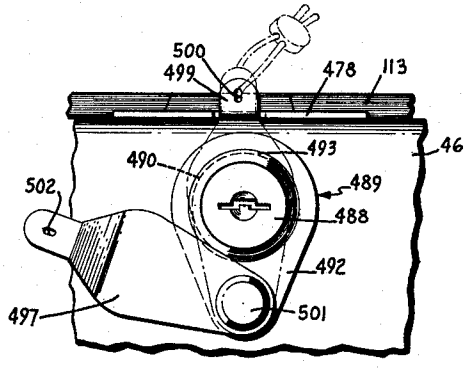


FIG. 30

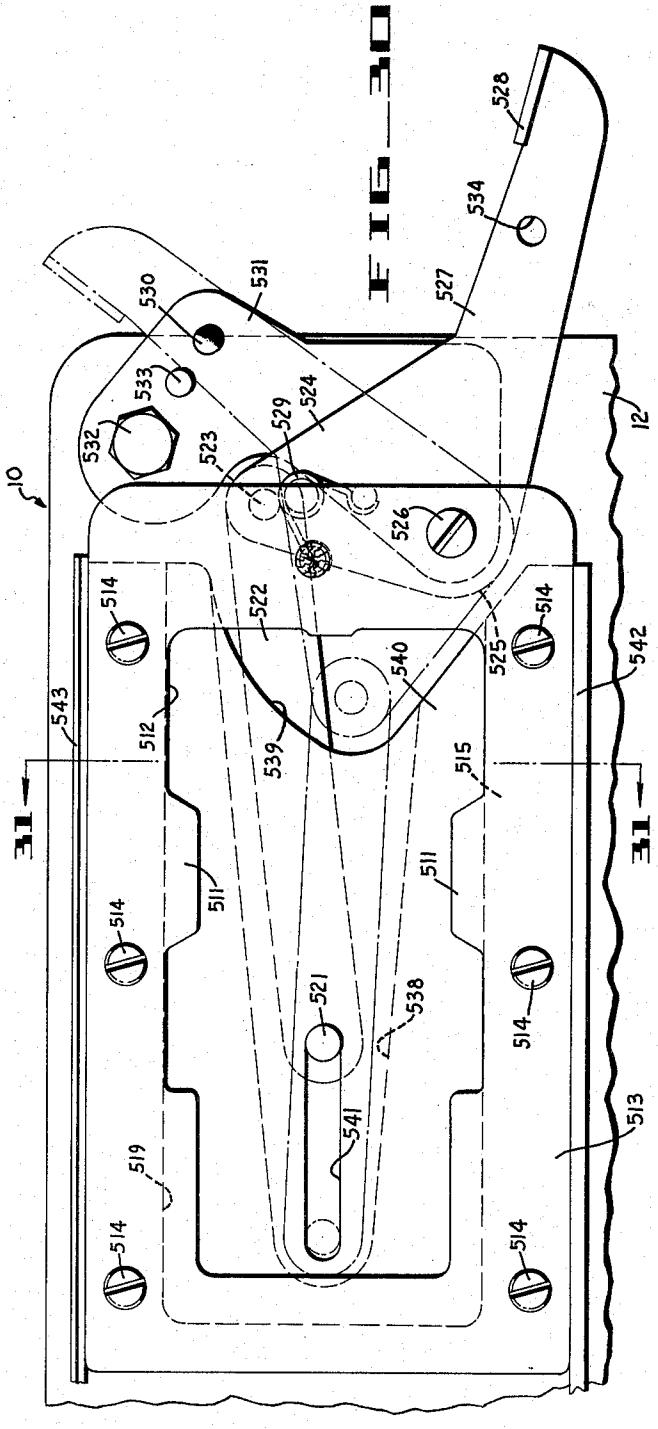
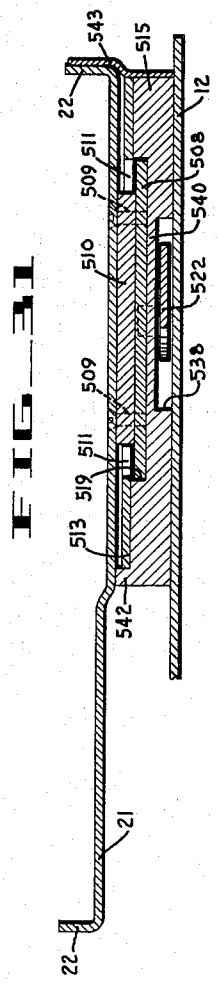

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FIG. 31

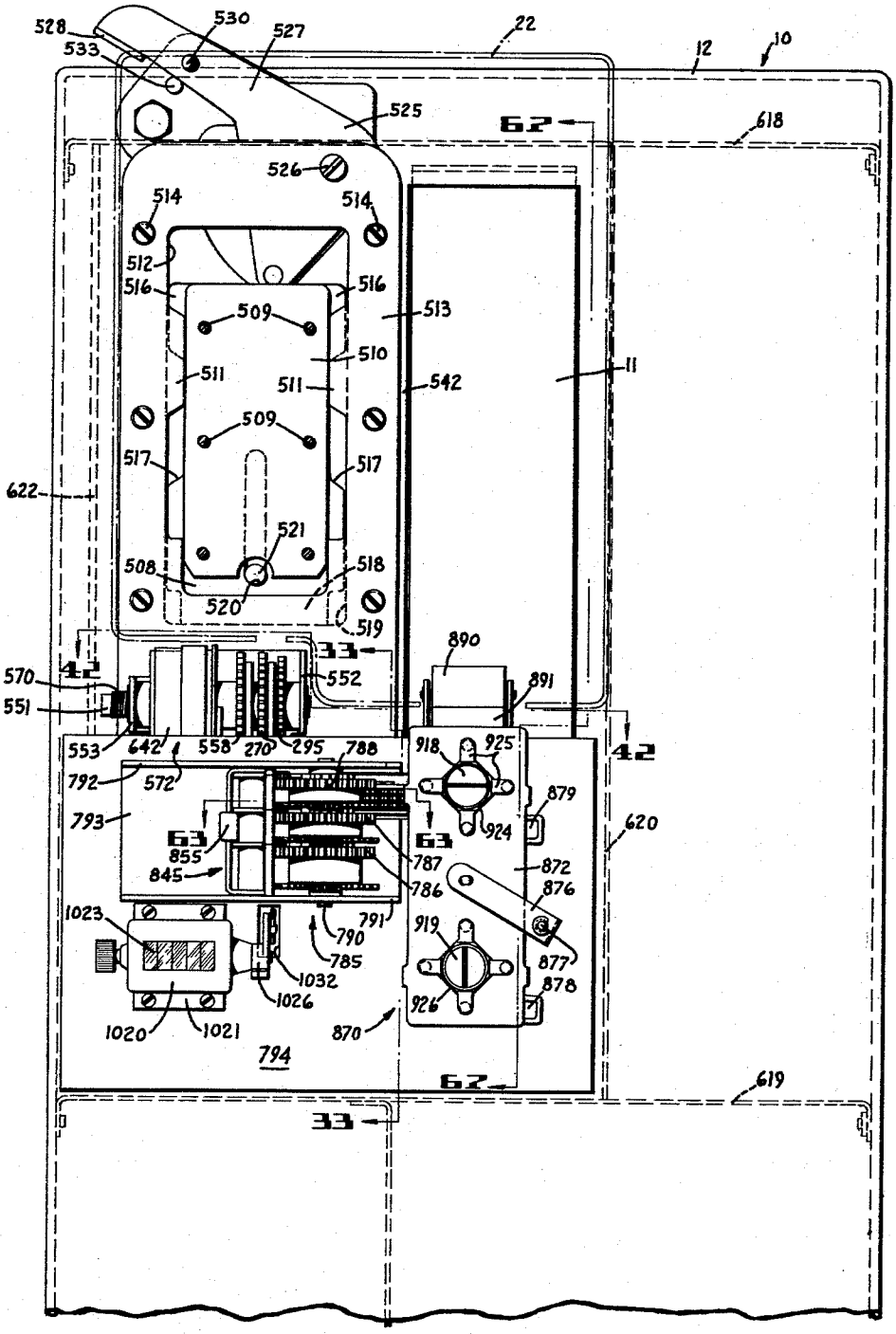

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POSTAGE METERING MACHINE

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FIG_32



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POSTAGE METERING MACHINE

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FIG_33

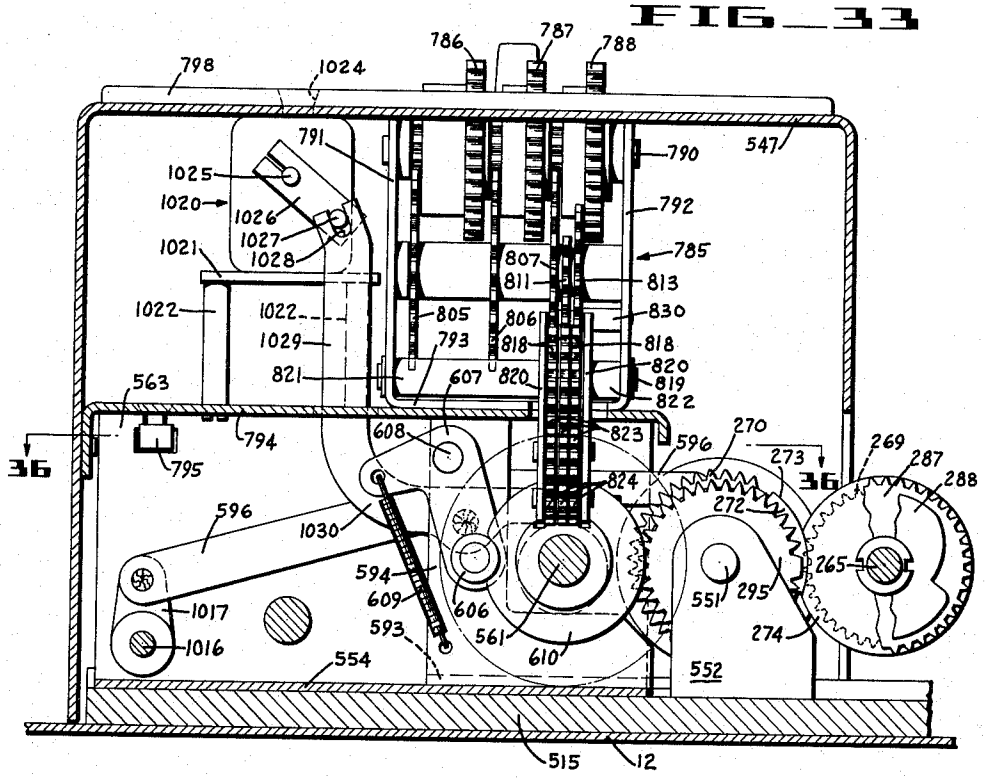


FIG_34

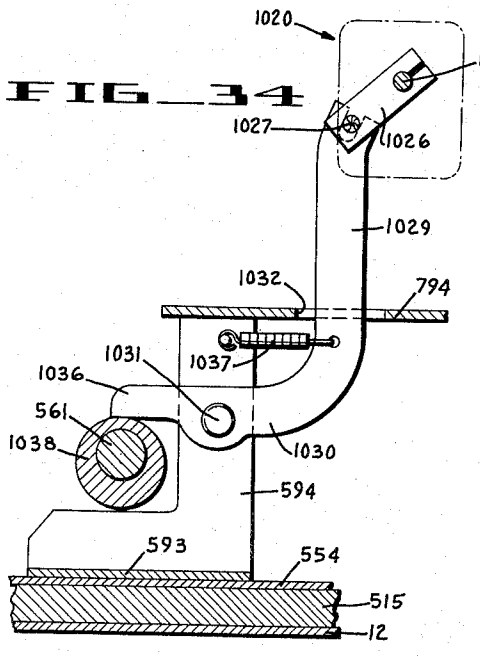
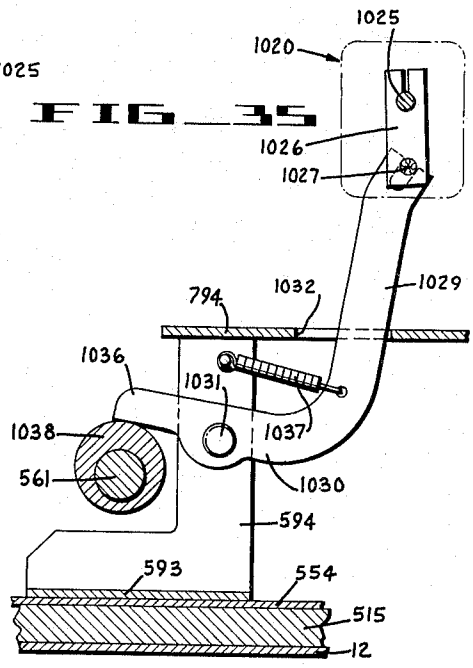


FIG_35



Oct. 22, 1963 I. H. LUNDQUIST 3,107,854

POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 16

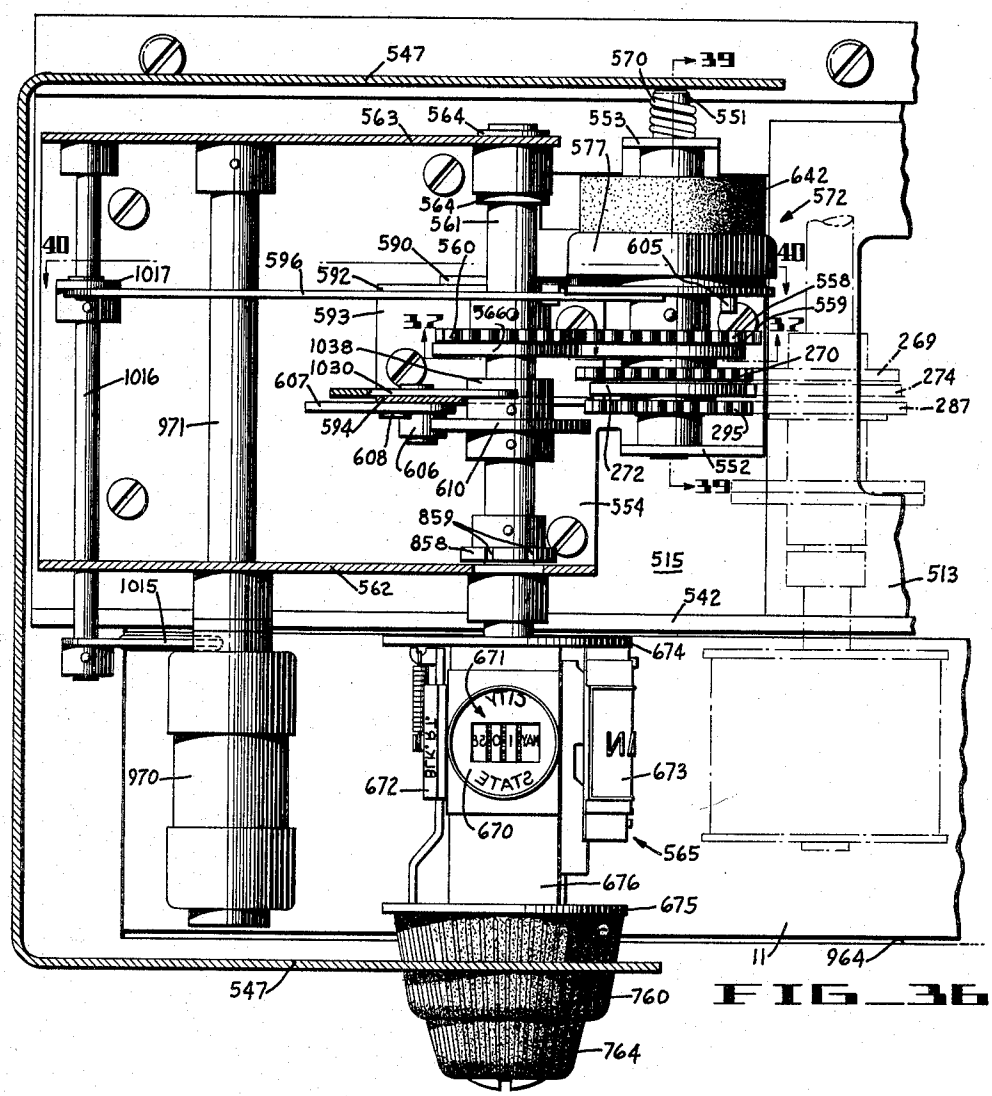


FIG_36

FIG_37

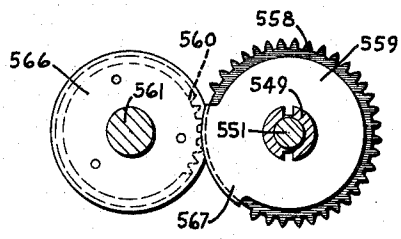
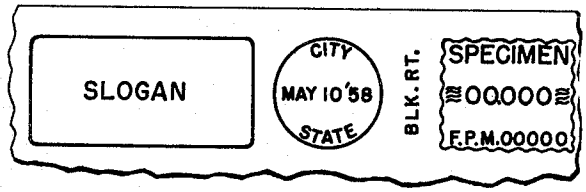


FIG_38



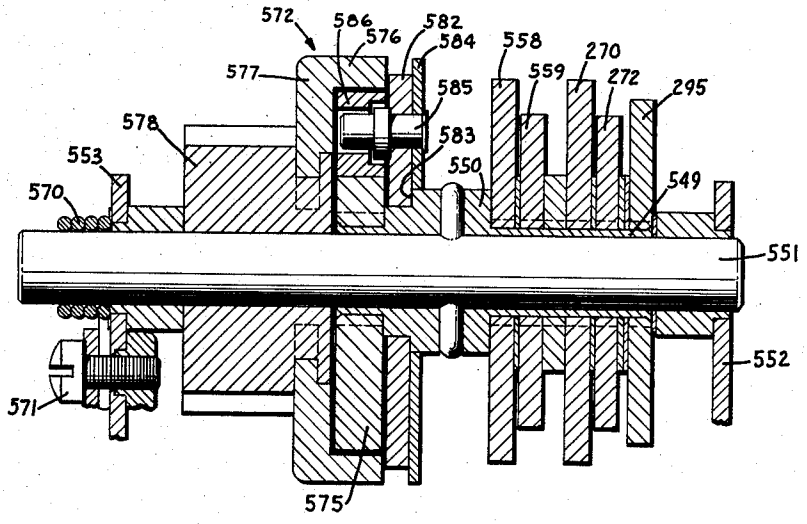


FIG_39

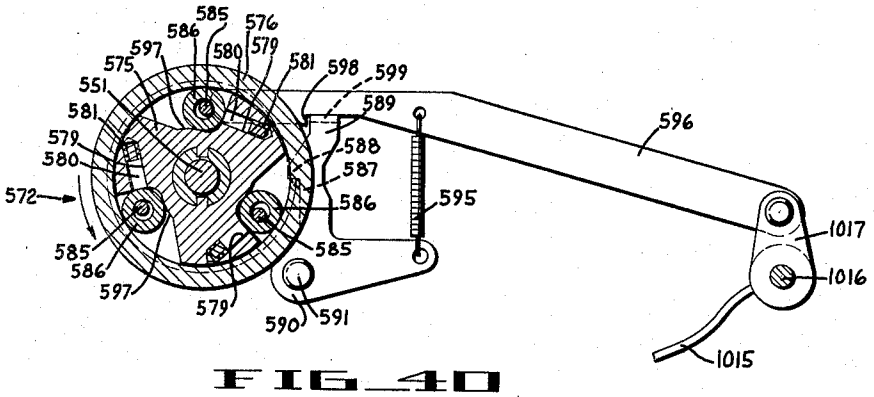


FIG_40

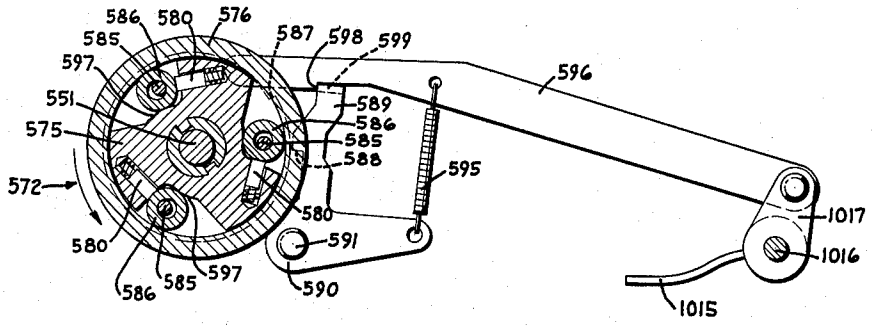


FIG_41

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POSTAGE METERING MACHINE

Filed March 24, 1959 26 Sheets-Sheet 18

FIG. 42

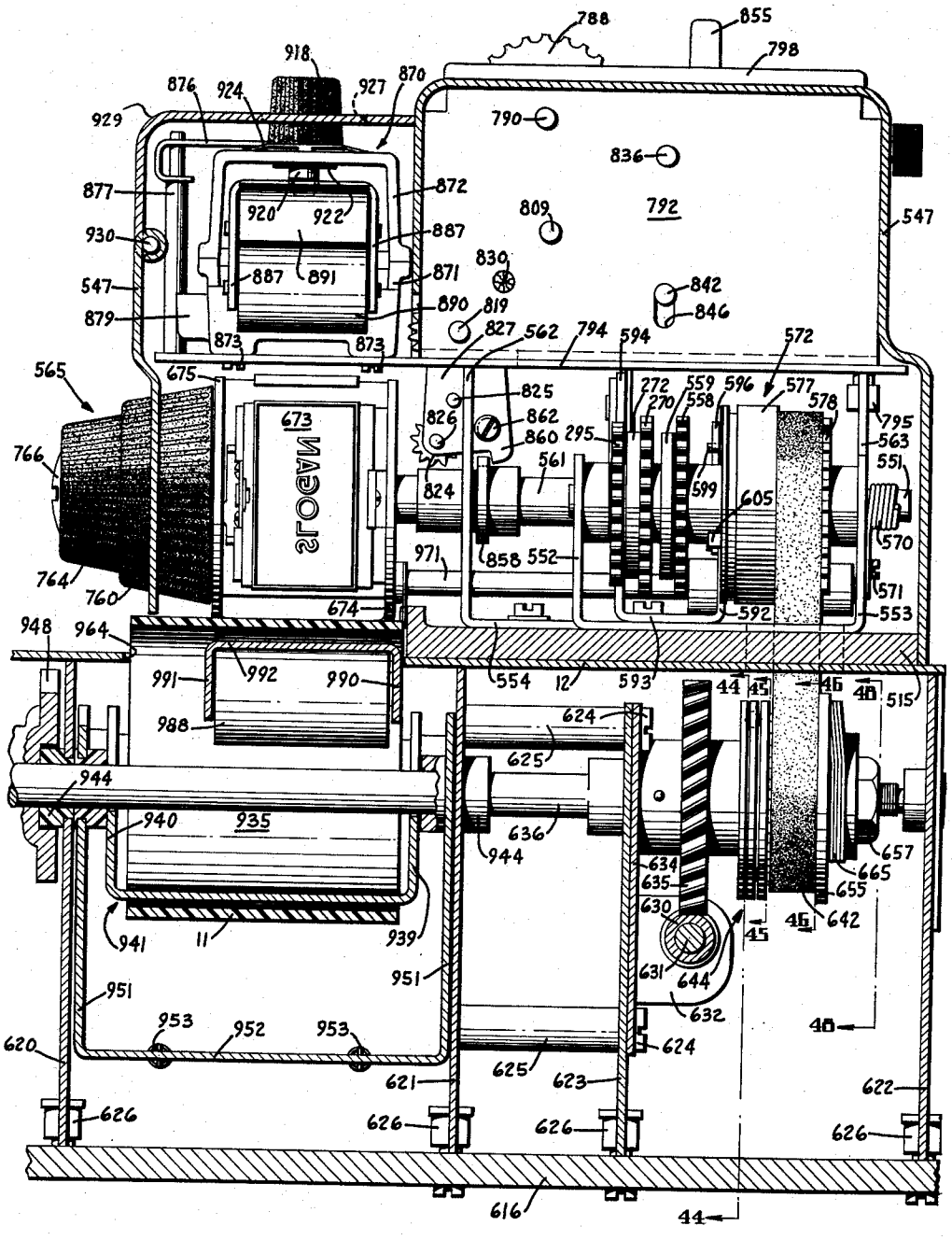
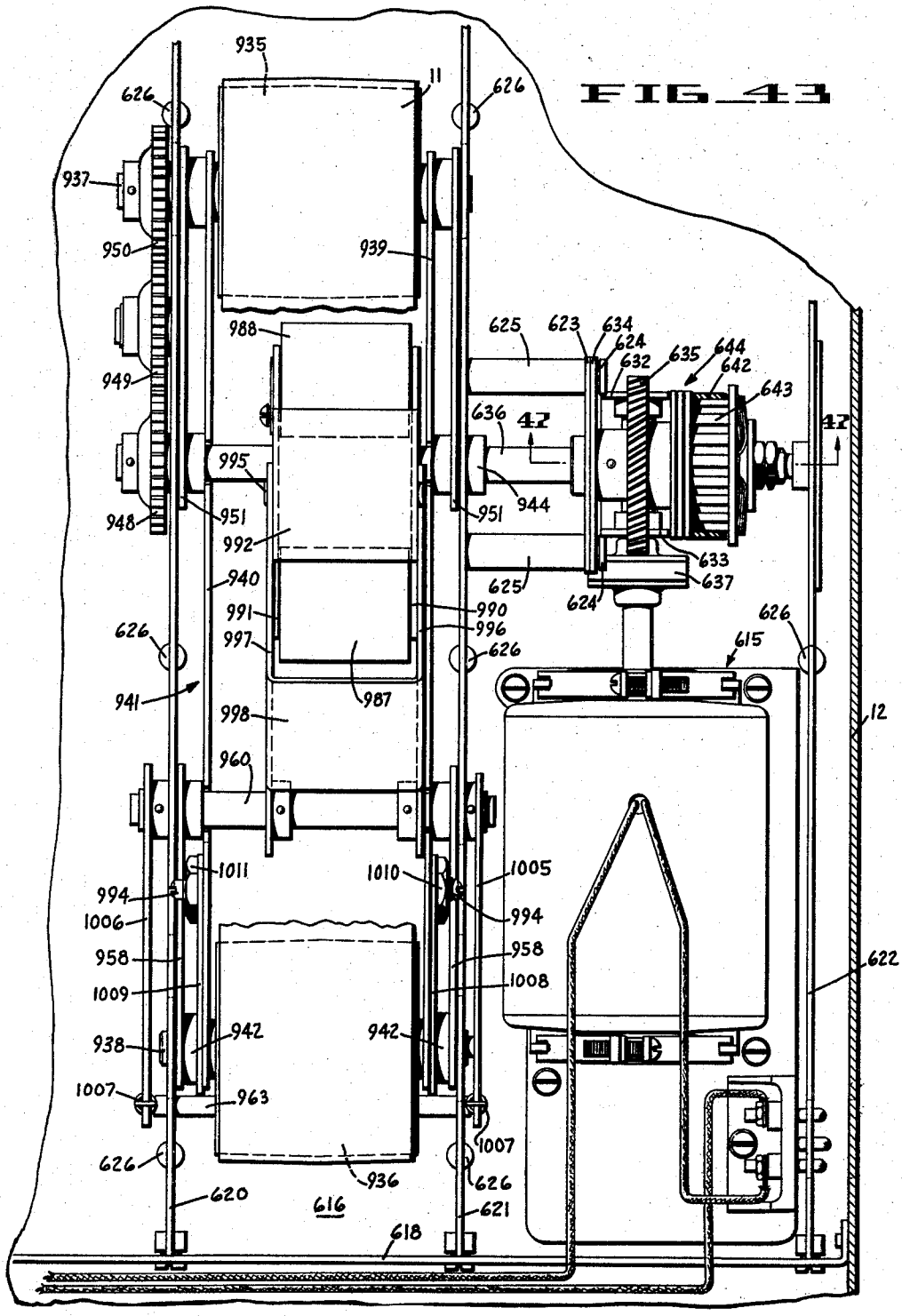


FIG. 43


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POSTAGE METERING MACHINE
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FIG. 44

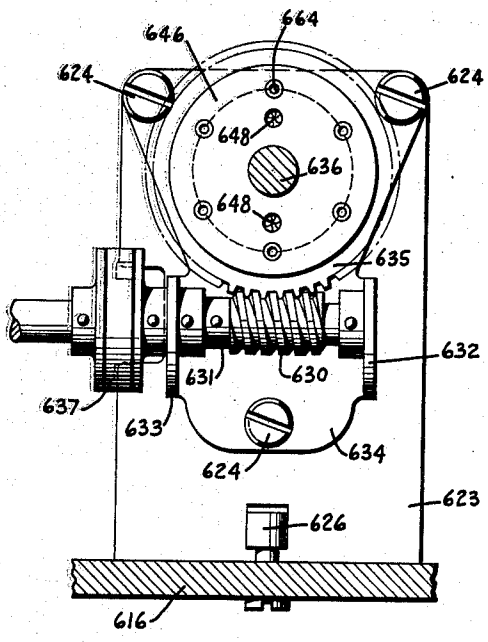


FIG. 45

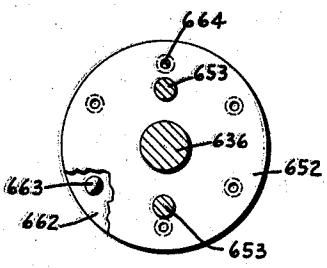
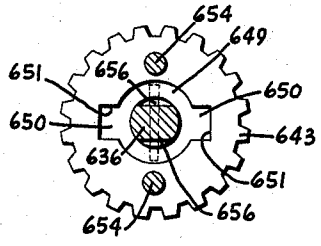


FIG. 46



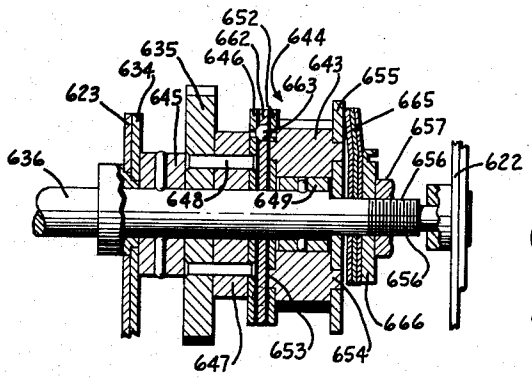


FIG. 42

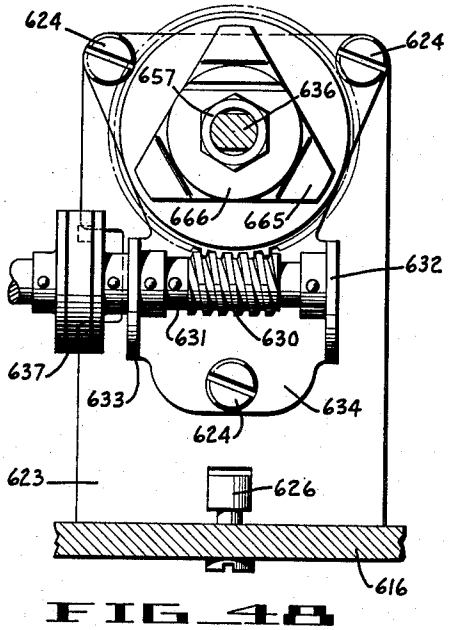


FIG. 48

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POSTAGE METERING MACHINE

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FIG_49

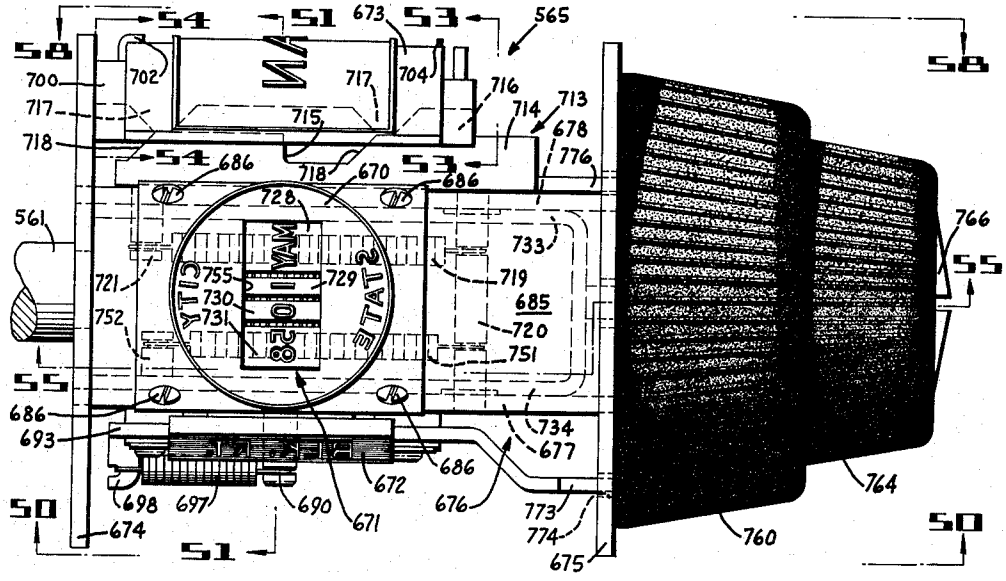


FIG_50

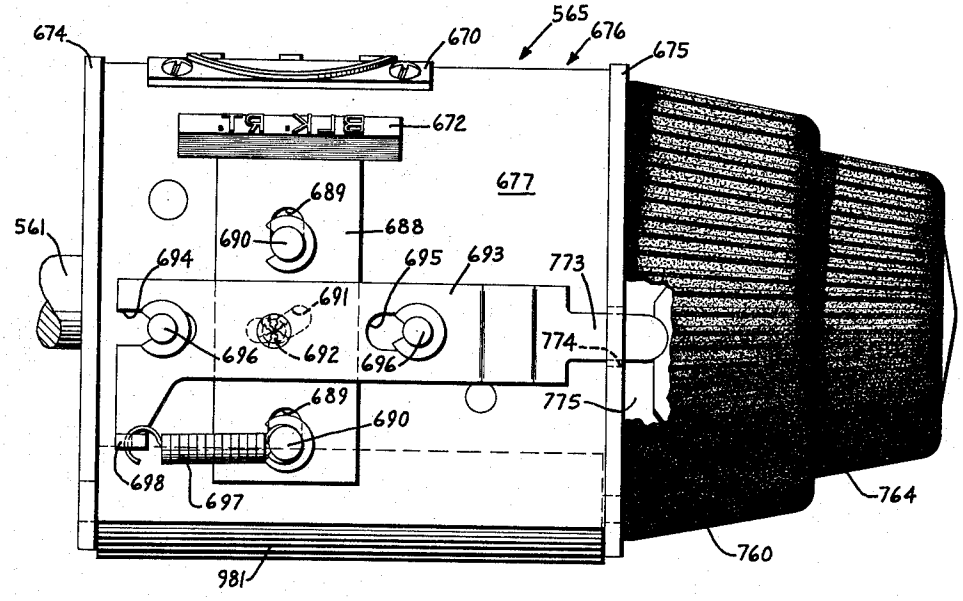
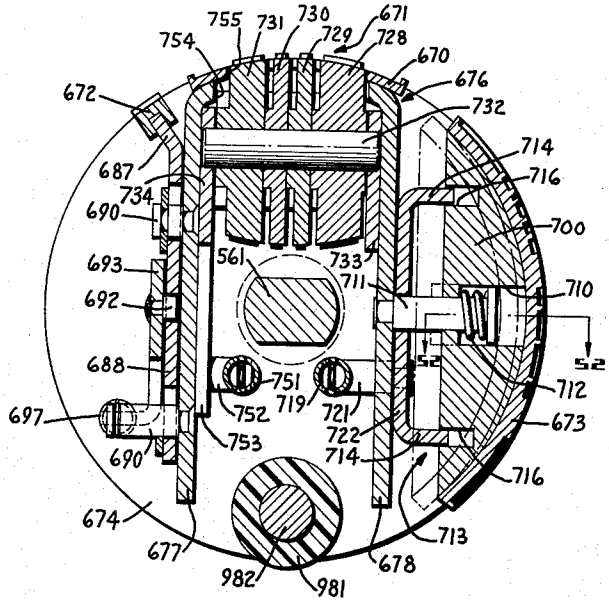


FIG_51



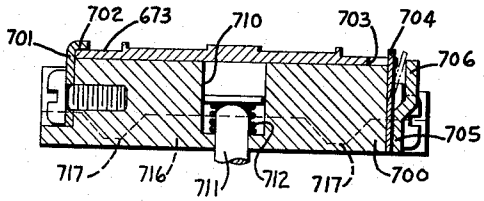


FIG_52

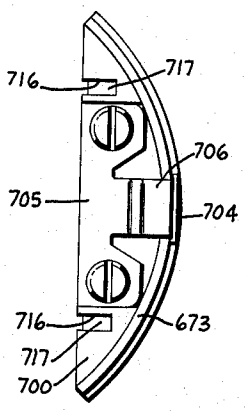


FIG_53

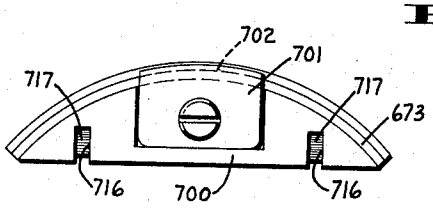


FIG_54

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POSTAGE METERING MACHINE

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FIG_55

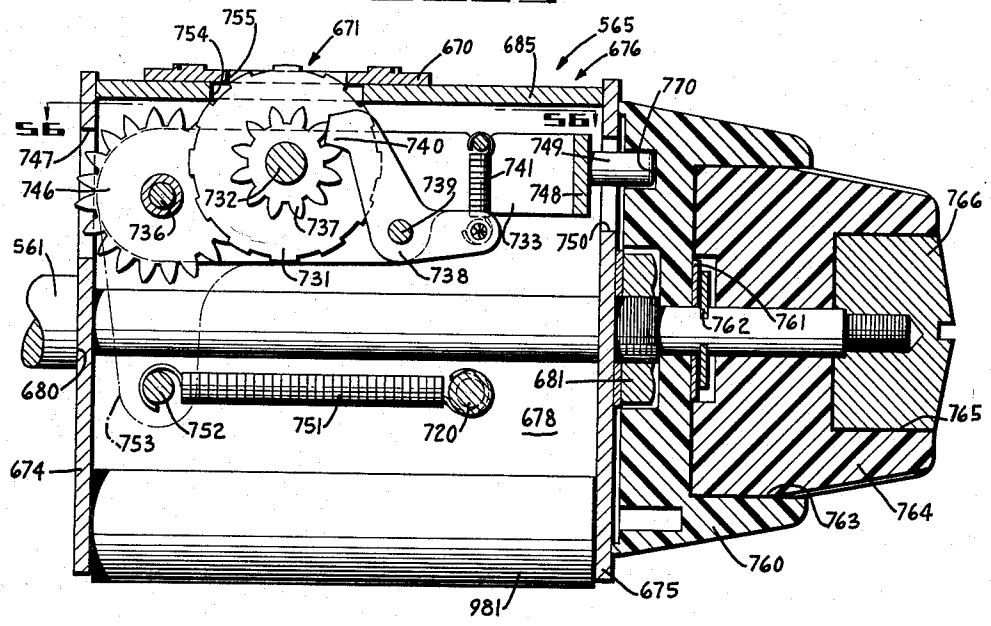


FIG_56

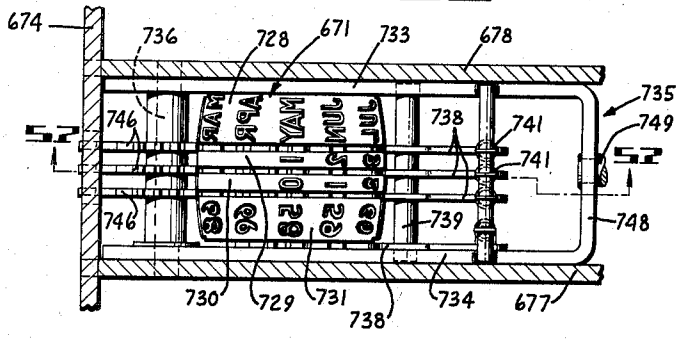
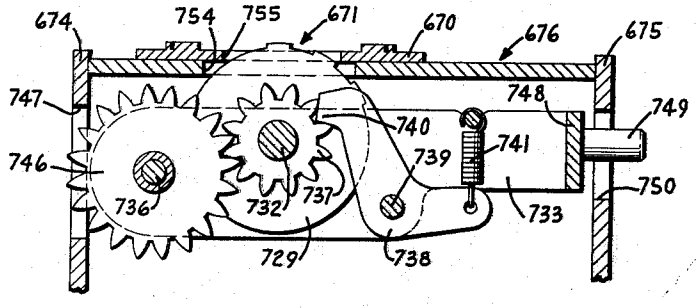


FIG_57

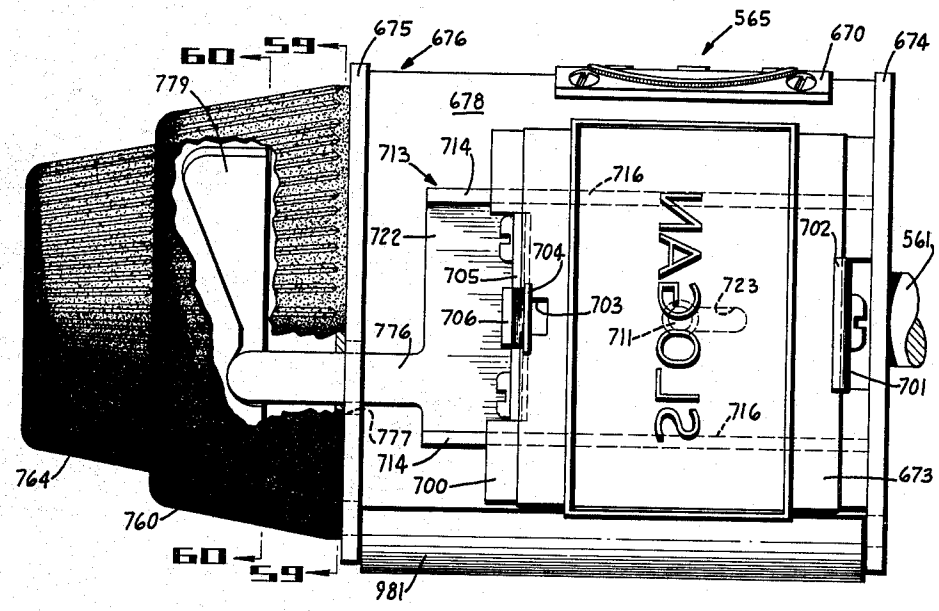


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POSTAGE METERING MACHINE

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FIG_58



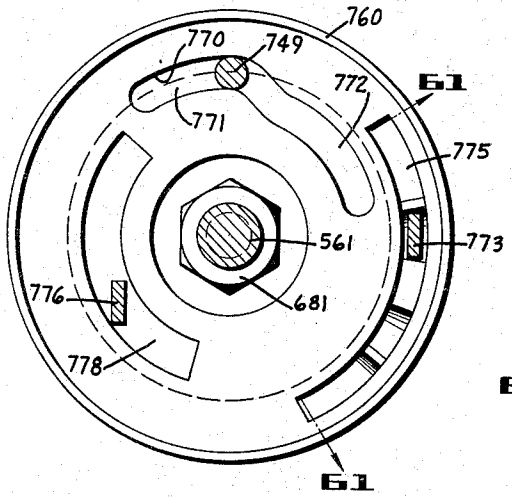


FIG_59

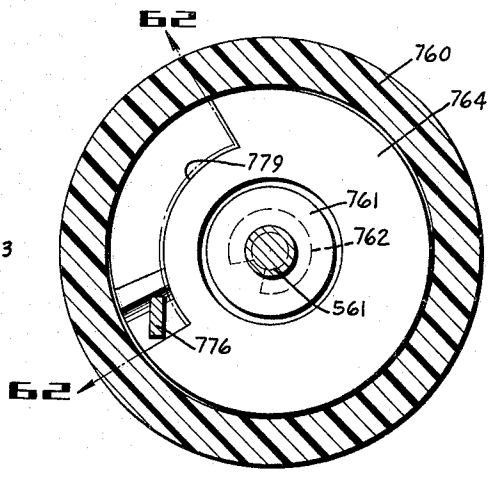


FIG_60

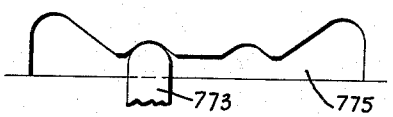


FIG_61

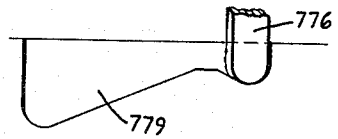


FIG_62

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POSTAGE METERING MACHINE

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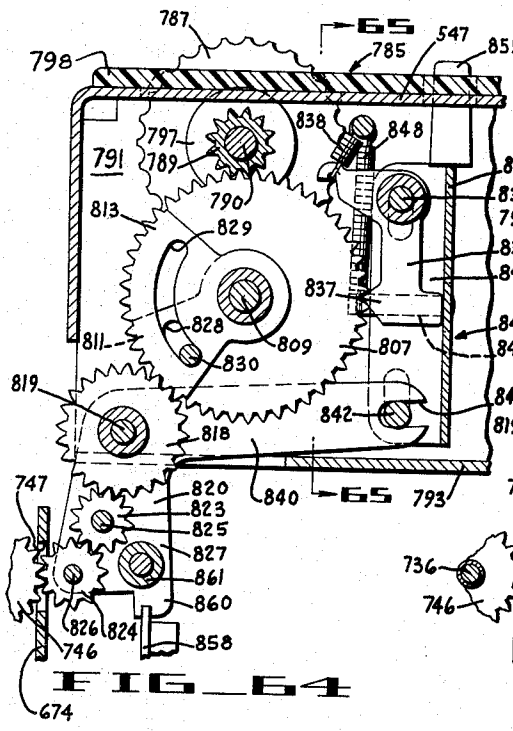


FIG_64

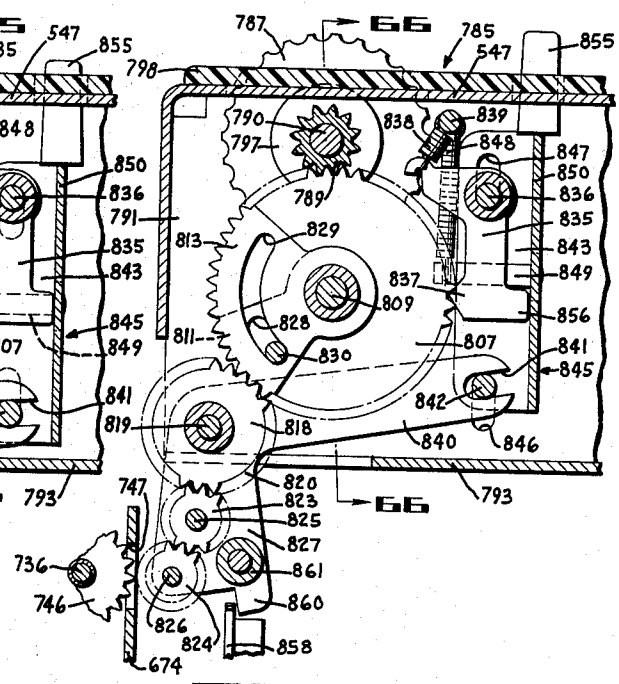


FIG_63

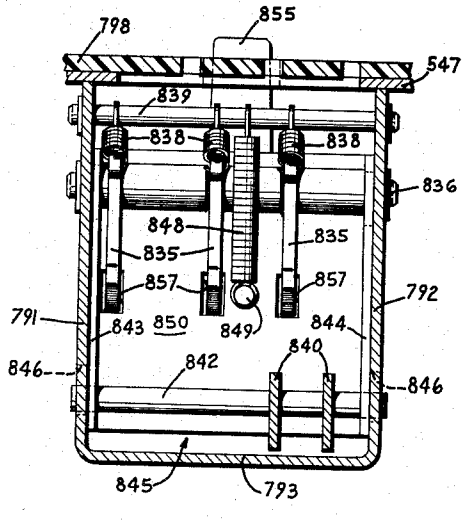


FIG_65

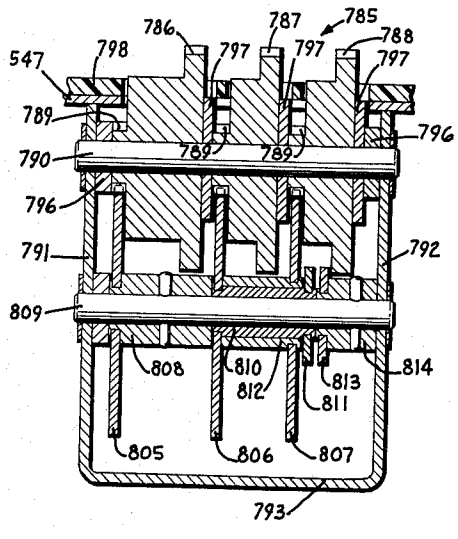


FIG_66

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POSTAGE METERING MACHINE

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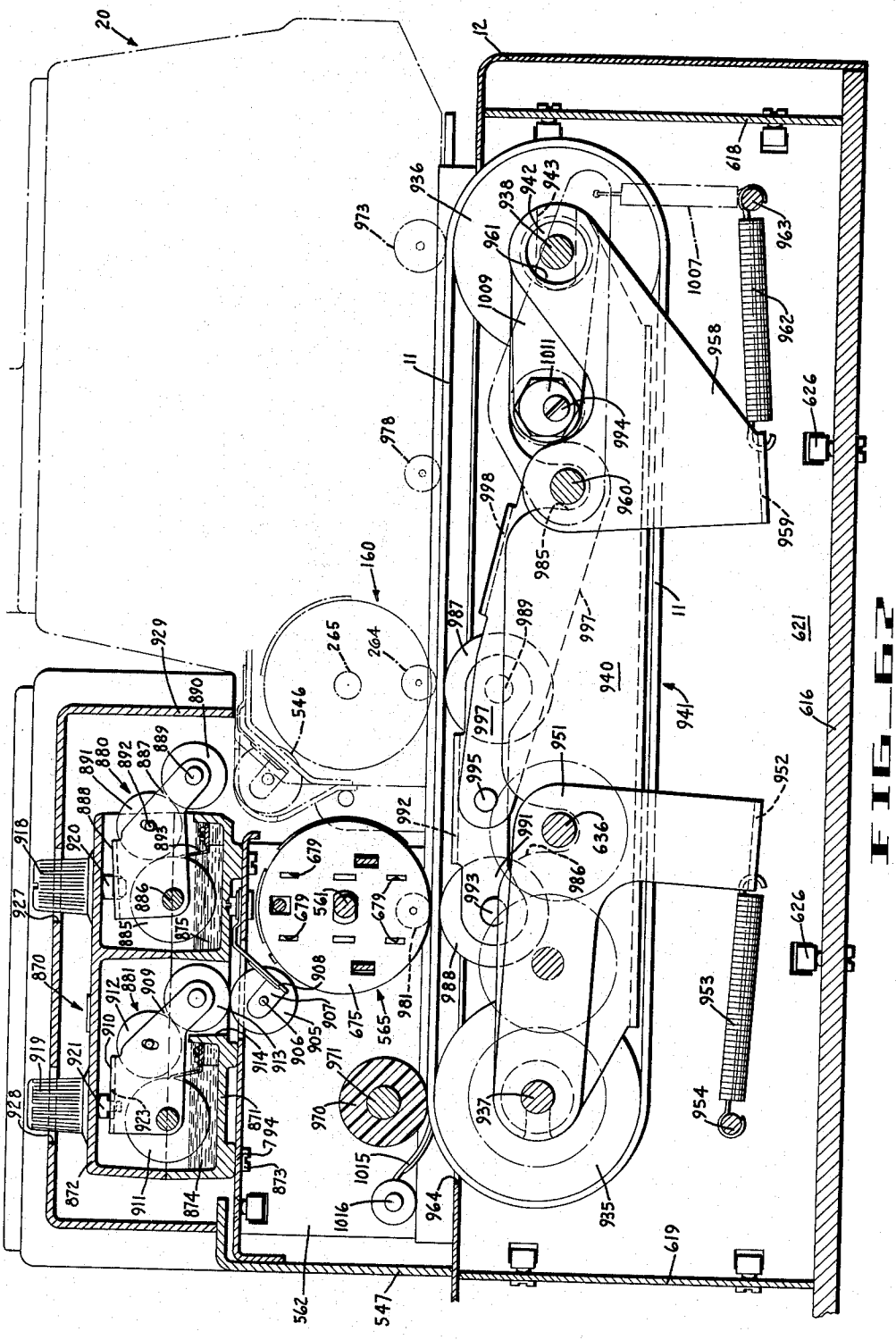


FIG. 62

United States Patent Office 3,107,854 Patented Oct. 22, 1963

3,107,854
POSTAGE METERING MACHINE

Ingemar H. Lundquist, Oakland, Calif., assignor, by mesne assignments, to International Postal Supply Corporation, a corporation of Massachusetts

Filed Mar. 24, 1959, Ser. No. 801,594
17 Claims. (Cl. 235—101)

This invention relates to postage metering machines for printing postal indicia on mail matter, and more particularly to a machine having two print heads, one of which is contained in the so-called "meter unit" of the machine and carries the indicia die. The other, or town circle, print head is driven in synchronism with the indicia print head and is contained in the "power unit" of the machine. In addition to the town circle die, the town circle print head also carries the dater die, the slogan die and the "Bulk Rate" slug. With the provision of two print heads in a postage metering device, only the print head in the "power unit" must be made easily accessible so that the slogan die might be changed from time to time as desired. The print head carrying the indicia die only may, therefore, be totally enclosed, except for a limited opening at the printing position of the print head. Hence, a locking access door in the indicia print head housing, or other access means and locking devices, are not required, thereby enabling the provision of a much simplified "meter unit" without the possibility of fraudulent use of the meter.

The "meter unit" is provided with an ascending, or accumulator, register and a descending, or subtracting, register and is preferably removably attached to the machine. A locking means is provided for securing the "meter unit" in its operating position in the machine. However, because of its small, compact, lightweight structure, the "meter" may be easily removed from the machine and carried to the post office, where a postal official can set the descending register to show the amount of prepaid postage purchased. Following the replacement of the "meter" in the machine, it may be operated to stamp any desired value on mail matter up to the maximum capacity of the machine which, in the embodiment shown and described, would be $99.99½. Successive individual stamp impressions may be effected until the total value of stamps printed equals a predetermined amount of the prepaid postage purchased, whereupon the meter automatically becomes locked to prevent further use thereof.

It is an object of the invention to provide an improved compact postal meter unit of simplified construction easily portable and having an automatic locking mechanism for precluding further use of the apparatus when the aggregate value of impressions made is equal to, or nearly equal to, a predetermined amount of the total prepaid amount preset in the descending register by a post office official.

It is an object of the present invention to provide a postage metering machine with two printing heads driven in synchronism and operable upon operation of the machine to invariably stamp mail matter with the desired postal indicia and town circle in proper spaced relationship.

It is an object of the invention to provide a print head in the removable meter of a postage metering machine and a second print head in the power unit of a postage metering machine, these print heads being driven cyclically in synchronism by a common driving means.

It is an object of the invention to provide a postage metering device with two print heads, one in the removable meter unit and the other in the power unit, cyclically and synchronously driven by a common driving means, which also serves to prevent replacement of the meter unit if removed from the metering device when one or the other print head is out of the full-cycle position.

A further object of the invention is to provide a postage metering device with an improved mechanism for the selective adjustment of the postage indicia dies.

Another object of the invention is to provide an improved print head for a postage metering device by means of which the town circle is printed with each operation of the device and the slogan die, dater die and "Bulk Rate" slug may be selectively moved from print to non-print position.

Another object of the invention is to provide an improved mechanism for selectively controlling the adjustment of the postage indicia dies in one print head of the postage metering device and a mechanism for selectively controlling the adjustment of the dater dies.

A further object of the invention is the provision of an easily replaceable slogan die in a print head of a postage metering device.

Another object of the invention is the provision of a key-controlled dater die adjusting mechanism for a print head of a postage metering machine.

Another object of the invention is to provide the portable meter unit of a postage metering machine with a key-controlled lock for providing access to the descending register for adjustment thereof by an authorized individual and/or enabling the removal of the cover from the meter unit.

A further object of the invention is to provide the meter unit of the postage metering device with an improved mechanism controlled by the descending register to lock the metering device against further operation when predetermined orders of the register return to "0" registration.

Another object of the invention is to provide an improved mechanism for selectively adjusting the type dies in the indicia printing head of a postage metering device to represent the desired amount of postage and for adjusting the meter unit to effect a registration of the amount of postage in each of two registers in accordance with the adjustment of the indicia type dies.

A further object of the invention is the provision of an improved tens-transfer mechanism for the descending and ascending registers of a postage metering device.

Another object of the invention is to provide an improved tens-transfer mechanism for the registers of a postage metering device, wherein a tens-transfer, when effected, takes place in each order dial following registration of a selectively set value and following the increment transfer thereinto, each dial becomes locked and remains locked until the end of the machine cycle of operation.

A further object of the invention is to provide the registers of a postage metering device with an improved tens-transfer mechanism which, when activated during any part of one cycle, is restored to inactive position at the beginning of the next succeeding cycle.

Other objects and advantages will appear from the following description of a preferred embodiment as illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of the postage metering device;

FIG. 2 is a plan view of the meter unit with the cover removed;

FIG. 3 is an elevational view of the belt drive of the meter unit taken on the plane 3—3 in FIG. 2;

FIG. 4 is a sectional plan view of the actuators and two of the slidable selection gears;

FIG. 5 is a sectional elevational view of the left end portion of the meter unit, the view being taken on the lines 5—5 in FIG. 2;

FIG. 6 is a sectional elevational view of the intermedi-

ate portion of the meter unit, the view being taken on the lines 6—6 in FIG. 2;

FIG. 7 is a sectional elevational view of the right end portion of the meter unit, the view being taken on the line 7—7 in FIG. 2;

FIG. 8 is a transverse sectional elevational view of the selector mechanism, the view being taken on the lines 8—8 in FIG. 5;

FIG. 9 is a fragmentary plan view of the selector portion of the meter unit with parts of the cover broken away to expose the selector dials and the controls therefor, the view being taken on the line 9—9 in FIG. 8;

FIG. 10 is a transverse sectional elevational view of the meter unit taken on the lines 10—10 in FIG. 5;

FIG. 11 is a fragmentary sectional elevational view of the actuators and selection shafts in the meter unit, the view being taken on line 11—11 in FIG. 10;

FIG. 12 is a sectional elevational view of the meter unit driving mechanism and indicia print head, the view is taken on the lines 12—12 in FIG. 2;

FIG. 13 is an elevational view showing the control for the indicia type wheel setting mechanism, the view being taken on the line 13—13 of FIG. 12;

FIG. 14 is an elevational view of the indicia type wheel setting mechanism, the view is taken on the line 14—14 of FIG. 12;

FIG. 15 is a sectional plan view of the indicia print head and a view of the setting mechanism therefor taken on line 15—15 in FIG. 14;

FIG. 16 is an elevational view of the indicia print head taken on the line 16—16 in FIG. 15;

FIG. 17 is an elevational view of the rear of the meter unit, the view being taken inside the cover;

FIG. 18 is a view showing the descending register controlled locking mechanism in the full-cycle position of the meter unit driving shaft, the view being taken on line 18—18 in FIG. 12;

FIG. 19 is a view similar to FIG. 18 showing the locking mechanism immediately after initiation of a cycle of machine operation;

FIG. 20 is a fragmentary plan view of the descending register of the meter unit including the tens-transfer mechanism;

FIG. 21 is a sectional elevational view of the descending register taken on the lines 21—21 in FIG. 20;

FIG. 22 is a sectional elevational view of the descending register taken on the line 22—22 in FIG. 20;

FIG. 23 is a sectional detail of a register dial and clutch, the view being taken on the plane indicated by line 23—23 in FIG. 22;

FIG. 24 is a sectional elevational view of a register dial showing the dial clutch, the view being taken on the line 24—24 in FIG. 23;

FIG. 25 is a view of each of the ordinal tens-transfer actuators showing the relative full-cycle position of the single tens-transfer tooth on each actuator;

FIG. 26 is a fragmentary plan view of the meter unit showing the removable cover for the descending register, the cover being in its locked position;

FIG. 27 is a fragmentary plan view of the meter unit similar to FIG. 26 but with the cover partially removed;

FIG. 28 is a fragmentary sectional elevational view of the lock for the register cover, the view is taken on the plane indicated by line 28—28 of FIG. 26;

FIG. 29 is a fragmentary elevational view showing the key lock and the shield therefor;

FIG. 30 is a fragmentary plan view of the support upon which the meter unit is to be removably mounted and the locking mechanism for securing the meter unit in operative position;

FIG. 31 is a fragmentary sectional elevational view of the meter unit support with the base portion of the meter unit locked in active position, the view being taken on line 31—31 in FIG. 30;

FIG. 32 is a plan view of the power unit with a portion of the cover removed to show the ink fount and dater die selector;

FIG. 33 is a sectional elevational view of the main drive mechanism and dater die selector mechanism, the view being taken on the lines 33—33 in FIG. 32;

FIG. 34 is an elevational view of the digital counter control mechanism;

FIG. 35 is a view similar to FIG. 34, except that the counter control mechanism is shown in its actuated position;

FIG. 36 is a sectional plan view of the main drive clutch-controlled driving mechanism and the driven shaft supporting the auxiliary print head, the view is taken on the line 36—36 in FIG. 33;

FIG. 37 is an elevational view of the driving connection between the clutch-controlled driving shaft and the auxiliary print head driven shaft, the view is indicated by the line 37—37 in FIG. 36;

FIG. 38 is a diagrammatical showing of the complete impression made by the postal metering device;

FIG. 39 is a sectional detail of the clutch-controlled driving mechanism, the view being taken on the line 39—39 in FIG. 36;

FIG. 40 is a sectional elevational view of the cyclic driving clutch and control therefor, the view is taken on the line 40—40 in FIG. 36 and shows the clutch disengaged;

FIG. 41 is a view similar to FIG. 40, except that the clutch is shown in its engaged condition;

FIG. 42 is a sectional elevational view of the main driving mechanism for the postal metering device and its belt-driven connection with the clutch-controlled driving mechanism, the view being taken on the lines 42—42 in FIG. 32;

FIG. 43 is a fragmentary plan view of the power unit with the cover removed to show the motor drive and conveyor system;

FIG. 44 is a sectional elevational view of the driving connection between the motor and the main drive shaft, the view is taken on the line 44—44 in FIG. 42;

FIG. 45 is a view of the ball overload clutch, the view being taken on the plane indicated by line 45—45 in FIG. 42;

FIG. 46 is an elevational view of the toothed pulley showing its mounting on the main drive shaft, the view being taken on line 46—46 in FIG. 42;

FIG. 47 is a sectional detail of the toothed driving pulley, ball overload clutch and worm drive gear, the view is taken on the line 47—47 in FIG. 43;

FIG. 48 is an elevational view showing the laminated overload clutch spring, the view being taken on the line 48—48 in FIG. 42;

FIG. 49 is a plan view of the auxiliary print head;

FIG. 50 is an elevational view of the auxiliary print head taken on the line 50—50 in FIG. 49;

FIG. 51 is a sectional elevational view of the auxiliary print head taken on the plane indicated by line 51—51 in FIG. 49;

FIG. 52 is a transverse sectional detail of the slogan die taken on the line 52—52 in FIG. 51;

FIG. 53 is a right side elevational view of the slogan die, the view being taken on the line 53—53 in FIG. 49;

FIG. 54 is a left side elevational view of the slogan die, the view being taken on the line 54—54 in FIG. 49;

FIG. 55 is a longitudinal sectional elevational view of the auxiliary print head, the view taken on the lines 55—55 in FIG. 49;

FIG. 56 is a sectional plan view of the auxiliary print head showing the dater die wheels, the view taken on the line 56—56 in FIG. 55;

FIG. 57 is a sectional elevational view of the dater die mechanism taken on the lines 57—57 in FIG. 56;

FIG. 58 is an elevational view of the auxiliary print head showing the slogan die, the view being taken on the line 58—58 in FIG. 49;

FIG. 59 is a sectional elevational view of the larger control knob for the auxiliary print head, the view taken on the line 59—59 in FIG. 58;

FIG. 60 is a sectional elevational view of the smaller control knob for the auxiliary print head, the view taken on the line 60—60 in FIG. 58;

FIGS. 61 and 62 show the developed contour of the cam-grooves within the respective large and small control knobs of the auxiliary print head, taken on the arcuate line 61—61 in FIG. 59 and the arcuate line 62—62 in FIG. 60, respectively;

FIG. 63 is a sectional elevational view of the dater dies selector mechanism, the view being taken on the lines 63—63 in FIG. 32;

FIG. 64 is a view similar to FIG. 63, except that the selector lock key is in depressed position to connect the selection mechanism with the dater dies;

FIG. 65 is a sectional elevational view of the dater dies selector mechanism, the view being taken on line 65—65 in FIG. 64;

FIG. 66 is a view of the dater dies selector mechanism taken on the plane indicated by line 66—66 in FIG. 63; and

FIG. 67 is a longitudinal sectional elevational view of the postage metering device with the meter unit indicated by phantom line, the view being taken on lines 67—67 in FIG. 32.

The machine to be described has a base portion, generally indicated at 10 (FIG. 1), which houses an electric motor, a gear transmission mechanism for driving an endless feed belt 11 moving in a plane parallel to, and above, the top surface of the cover 12 of base portion 10. The gear transmission mechanism in base portion 10 functions through a suitable driving connection to impart rotation to a clutch-controlled driving shaft within the housing, generally indicated at 15. The housing 15 is supported on the cover 12 of the base portion 10 and a portion thereof overlies the belt 11 in juxtaposed relationship thereto to permit the passage of mail matter between the housing and the belt. Base portion 10 and main drive housing 15 comprise what will hereinafter be referred to as the "power unit."

A postage meter unit, indicated at 20 in FIG. 1, is removably mounted on the cover 12 of the base portion 10 adjacent the housing 15 for engagement with the main drive mechanism and is positioned for cooperation with feed belt 11. Contained within the postage meter unit 20 is the postage indicia print head; a descending register selectively settable only by a post office official to represent the amount of prepaid postage purchased, an ascending register for indicating the total value of postage impressions which have been made, and a postage value selection mechanism for adjusting the numeral type wheels in the indicia print head and for adjusting a registering mechanism to effect the registration of a postage value subtractively in the descending register and additively in the ascending register. In addition to the postage indicia printing head, a second, or auxiliary, printing head is contained within the main drive housing 15 and is provided with a town circle die, dater type wheels, a "Bulk Rate" die and a removable slogan die. The auxiliary print head is cyclically driven directly from the main drive mechanism, which also serves through suitable gearing to impart a synchronous cyclic rotation to the postage indicia printing head, as will be described hereinafter.

For a better understanding of the description of the postage metering device, the longer dimension of the machine, as viewed in FIG. 1, will be considered to be the front with the ON-OFF switch located on the right end thereof, thus any reference hereinafter to "front" or "rear," "right" or "left," will be made with this in mind. The meter unit 20 includes a base 21 (FIGS. 2, 10 and 12) having a lip 22 formed at a right angle thereto and extending around the perimeter thereof. A bar 23 is secured to the inside of lip 22 (FIGS. 2 and 7) at the right end of the base 21 and is provided with two spaced-apart notches, in which the tongue on the lower right end of each of respective frame plates 24 and 25 is inserted to maintain the frame plates in a spaced parallel relationship and to secure the frame plates in place against the base. The spaced parallel relationship of the frame plates 24 and 25 is further maintained by means of a plate 26 and a channel member 27 (FIGS. 2, 5 and 6). At its upper edge, each of frame plates 24 and 25 is provided with a lateral extension, formed inwardly at a right angle thereto, for supporting respective ends of plate 26 which is secured in place by any suitable means, such as screws 28. Channel member 27 is supported in a similar manner having a pair of spaced-apart ears 29 which extend from each end of the web portion of the member 27 and are positioned in suitable notches in the upper edge of each of frame plates 24 and 25. The channel member 27 is secured in place by any suitable means, such as screws 30 (FIGS. 2 and 17), threaded into circular nuts 31, each nut having a diametrical slot cut therein to engage the upper margins 32 of generally rectangular apertures 33 in each frame plate member 24 and 25.

Within the lip defined left end portion of base 21 is provided a subbase 40 (FIGS. 2, 12, 13 and 14) secured to the lip 22 by means of a plurality of similar screws 41. Secured on subbase 40, adjacent its ends, are respective auxiliary frame plates 42 and 43, and intermediate its ends a bracket 44 is likewise secured thereto. At its left end, as viewed in FIG. 2, each of frame plates 24 and 25 is supported on subbase 40 and is secured to respective auxiliary frame plates 42 and 43 by any suitable means, such as a plurality of similar screws 45, as indicated in FIG. 12.

A cover 46 is secured and locked in place on the frame of the meter unit 20 in a manner to be described hereinafter. At its lower open end, the cover 46 is formed to correspond with the outer contour of the perimetrical lip 22 of the base 21 so that, when in place, the cover adjoins the outer surface of the lip. Thus, the internal mechanism of the "meter unit" is substantially sealed against dust and dirt and when locked in place, the cover serves to prevent unauthorized access to any part of the meter mechanism.

In order that the "meter unit" may be easily carried from its place of operation to the post office and return, a bail handle 47 is provided. One arm of the bail handle 47 (FIGS. 5, 8, 9 and 17) is pivotally supported by means of a shoulder screw 52 on a bar 48 adjacent the outer end thereof. The bar 48 extends through an aperture in the cover 46 and is secured adjacent its lower end on one flange 49 of channel member 27. The other arm of the bail handle 47 is pivotally supported by means of a similar shoulder screw 52 on the vertically disposed leg of an angle bracket 50 (FIGS. 7 and 17) extending through a suitable aperture in the top of cover 46, the horizontally disposed leg of the bracket being secured to the underside of the cover by any suitable means, such as screw 51.

Disposed within the cover 46 of the meter unit 20 is the value selection mechanism, the postage indicia printing head settable by the selection mechanism, a descending register adjustable by a duly authorized employee of the post office to register the prepaid postage purchased, an ascending register effective to indicate an accumulation, or total value, of the postage impressions made by the indicia printing head, and an actuating mechanism cyclically operable to effect a subtractive and an additive registration of each selected postage value in the descending and ascending registers, respectively.

Selection Mechanism

Referring to FIGS. 4, 5, 6, 7, 10 and 11, a pair of stepped drum actuators 56 and 57 are secured in spaced-apart relation on a transverse actuator shaft 58 journaled

adjacent its ends in front frame plate 24 and rear frame plate 25. On the periphery of each of the actuators 56 and 57 is provided a series of teeth 59 and 60, respectively. There are nine teeth in each of the series 59 and 60, the upper tooth shown in FIG. 4 being the shortest, while the eight succeeding teeth are each longer by equal increments with the lowermost tooth shown having the greatest axial length. Each of the teeth in series 59 is in axial alignment with the corresponding teeth of series 60, so that the tooth of greatest length in each of these series passes a given point at the same time. Each actuator drum 56 and 57 serves, upon a complete rotation thereof, to impart selective incremental rotation to selected ones of a series of square shafts 61, 62, 63, 64 and 65. The square shafts 61 to 65, inclusive, are arranged in axial parallelism with each other and with the actuator shaft 58 and are equi-angularly disposed in an arc concentric with shaft 58. At its ends, each of the square shafts 61 to 65, inclusive, is circular in cross-section and serves as a journal for the shaft in frame plates 24 and 25.

Each of the square shafts 61, 62, 63, 64 and 65 carries a ten-tooth pinion, or selection gear, 66, 67, 68, 69 and 70, respectively, slidably and nonrotatably mounted thereon. As seen in FIG. 10, each of the pinions 66, 68 and 70 is normally inoperatively positioned in the space provided between the actuator drums 56 and 57, while pinions 67 and 69 are normally inoperatively positioned immediately to the left of actuator drum 57. Each of the pinions 66, 67, 68, 69 and 70 may be selectively moved differentially to the right along its shaft, from the inactive position shown in FIG. 10, to an active position for meshing engagement with selected teeth on actuator drums 56, 57, i.e., pinions 66, 68 and 70, when moved to active position, mesh with selected teeth of the series of teeth 59 on actuator 56, and pinions 67 and 69, when moved to active position, mesh with selected teeth of the series of teeth 60 on actuator 57. Referring now to FIG. 4, it can be seen that, upon three increments of movement of selection gear 66 to the left, three teeth of the series of teeth 59 will become enmeshed with gear 66, upon counter-clockwise rotation of shaft 58, as viewed from the left, thereby imparting three increments of rotation to square shaft 61. To control the incremental differential movement of the pinions 66, 67, 68, 69 and 70, each is provided with a hub having an annular groove 71 formed therein for cooperation with mechanism now to be described.

Each flange, or leg, 75 and 76 of an inverted substantially U-shaped bracket, or crossframe member, generally indicated at 77 (FIGS. 5 and 8), is secured at its ends in respective frame plates 24 and 25 by means of machine screws 78 and circular nuts 79, similar to screws 30 and nuts 31, as shown in FIG. 17. The flanges 75 and 76 are secured in parallel planes and adjacent frame plate 25, each flange is extended downwardly, providing lobes which are maintained in spaced-apart relation by means of a spacer stud 80 (FIG. 8). Each of five selection slides 84, 85, 86, 87 and 88, and each of four indicia type wheel adjusting slides 89, 90, 91 and 92 are juxtapositioned between the flanges 75 and 76 of the U-shaped crossframe member 77. Adjacent the forward, or left, end thereof (FIG. 8), each of the selection slides and type wheel adjusting slides are supported for endwise sliding movement within bracket 77 by the engagement of a horizontally disposed elongated slot 93 in each slide with a laterally disposed spacer rod 94 secured at its respective ends in flanges 75 and 76. At the rearward, or right-hand, distended end thereof, each of the slides is further supported for endwise movement by the engagement of each of a pair of horizontally disposed spaced-apart parallel slots 95 therein with the corresponding one of a pair of laterally extended parallel spacer rods 96 secured at their respective ends in flanges 75 and 76. A square notch 97 is provided in the rearward end of each slide of each outside pair of slides 84, 85 and 89, 90 and is sufficiently larger in dimension than the securing nuts 79 to enable the full extent of movement of the slides to the right, as viewed in FIG. 8. The selection slides 84, 85, 86 and 87 cooperate with the respective type wheel adjusting slides 89, 90, 91 and 92 in a manner to be described later and also serve to control the differential adjustment of the respective selection pinions 66, 67, 68 and 69, the adjustment of the pinion 70 being under the control of slide 88.

Each increment of sliding adjustment imparted to any one of the selection slides 84, 85, 86, 87 or 88 will cause a like translation of the respective pinions 66, 67, 68, 69 and 70 along the corresponding square shaft. To this end, selection slide 84, representative of five mills or a ½¢ value, carries a laterally extended finger 98 which is engaged at its end in the annular groove 71 of pinion 66 (FIGS. 5, 6, 8 and 10). Each selection slide 85, representative of units of cents, and selection slide 86, representative of tens of cents, have a lateral projection 99 and 100, respectively, engaged at their ends in the groove 71 of the corresponding pinions 67 and 68. Similarly, selection slides 87 and 88, representative of the units of dollars and tens of dollars, respectively, are provided with respective projections 101 and 102. Projection 101 extends angularly downwardly and outwardly from the slide 87 to engage in the annular groove 71 of pinion 69, while projection 102 is angularly disposed downwardly from its slide 88 to engage at its end in the groove 71 of pinion 70. The width of the end of each of the fingers, or projections, 98 to 102, inclusive, at the point of engagement with the groove 71 of the corresponding pinion, is slightly less than the width of the groove, so that there is very little, if any, lost motion between the selection slide and the corresponding pinion.

A manually controlled selector mechanism is provided for effecting a selective incremental adjustment of each selection slide, thereby differentially adjusting the corresponding selection gear, or pinion, relative to actuator 56 or 57. In the postage metering device shown and described herein, there is a five-order, or bank, selection mechanism which may be selectively set to represent postage values from ½¢ to, and including $99.99½. The maximum amount of postage is more than adequate to meet any possible postage requirement. For the selection of a desired amount of postage, a wheel 103 (FIGS. 2, 5, 6, 8, 9 and 10) is provided for each order of the selection mechanism, rotatably mounted on a laterally disposed shaft 109 secured at its resepctive ends in the flanges 49 and 110 of channel member 27. The wheels 103 are equally spaced-apart on shaft 109, the spacing being such, that there is no difficulty encountered in the selective use of any one wheel. To further facilitate its use, the peripheral edge of each wheel 103 is knurled, or ribbed, and extends through aligned openings in the web portion of the channel member 27 and meter cover 46 which form an aperture 114 and through individual openings in a register cover 113 which, in the embodiment shown, is molded of a thermoplastic material. The wheels 103 extend above the top surface of the register cover 113 only sufficiently to permit an operator to roll his finger over the wheel, imparting rotation thereto.

A selective angular rotation of each wheel 103 serves to impart differential movement to the corresponding ordinal selection slide and a like movement to the associated selection pinions. For this purpose, each selection slide 84, 85, 86, 87 and 88 carries a vertically extended member 115, 116, 117, 118 and 119, respectively (FIG. 5). Members 115 and 116 are laterally offset to the right of member 117, extending through an opening 122 provided in the upper portion of U-shaped bracket 77 (FIGS. 5 and 8), while members 118 and 119 are laterally offset to the left of the member 117 and also extend upwardly through opening 122. The members 115 to 119, inclusive, are equally spaced-apart in accordance

with the spacing of the wheels 108, and along the upper extremity of each member a ten-tooth rack 120 is disposed horizontally thereon for meshing engagement with a corresponding twelve-tooth pinion 121 secured to the hub of each wheel 108 (FIGS. 2, 8 and 10). Thus it can be seen, that upon clockwise rotation of each wheel 108 (FIG. 8), the associated selection slide may be moved from the rightmost position shown in FIG. 8 to the leftmost position, as determined by the engagement of the right end of slot 93 and slots 95 with the respective pins, or rods, 94 and 96. The movement of each slide from one extreme position to the other extreme position is equivalent to ten incremental steps of movement. However, as will be explained later, the wheel 108 associated with the ½¢, or mills, order, i.e., the right-hand order (FIG. 6), is permitted but 150° rotation in either direction, limiting the corresponding selection slide 84 to five incremental steps of movement. The opening 122 provided in the U-shaped bracket 77 is of sufficient length to accommodate the laterally offset vertically extended members 115, 116, 118 and 119 in the movement of the corresponding selection slides from one extreme position to the other. A portion of the lower section of flange 75 has been formed outwardly of the opening 122 and at a right angle to the flange to strengthen the flange at this point and to provide a surface upon which the horizontally disposed section of the offset member 119 may be supported (FIG. 5). Similarly, a portion of the lower section of flange 76 has been formed outwardly of the opening 122 at a right angle to the flange, thus strengthening this portion of the flange and providing a suitable support for the horizontally disposed section of the offset member 115 and the lateral projection 98.

In the embodiment shown, the extreme right-hand position of the selection slides 84 to 88, inclusive, as seen in FIG. 8, is to be regarded as representative of "0," and the associated selection pinions 66 to 70, inclusive, will be in the inactive position shown in FIG. 10. Likewise, the leftmost position of all the selection slides, except slide 84, will be representative of "9" and the selection pinions associated therewith will be translated to the right in FIG. 10 for meshing engagement with the nine teeth on the corresponding actuator drums 56 and 57. A 270° rotation of each wheel 108 in a clockwise direction, as viewed in FIG. 8, other than the wheel 108 associated with the selection slide 84, will move the associated slide to the extreme left position and, when thereafter rotated in a counter-clockwise direction, will return the associated slide to the extreme right position. Each 30° of rotation of a wheel 108 in either direction from one extreme position to the other will impart an increment of movement to the associated slide, e.g., if the tens of cents wheel 108 is rotated 120° in a clockwise direction, as viewed in FIG. 8, selection slide 86 associated therewith will receive four increments of movement to the left and the corresponding selection pinion 68 will be differentially moved to the right (FIG. 10) relative to actuator 56. Thereafter, the longest tooth and three successively shorter teeth on actuator 56 will become effective, upon cyclic rotation of actuator shaft 58, to impart four increments of rotation to square shaft 63.

Means are provided in each of the four orders shown in FIG. 5, i.e., those orders to the left of the five mills, or ½¢, order, to resiliently retain a selected wheel 108 of the selector mechanism in each 30° rotated position thereof. For this purpose, each of these wheels 108 is provided with a twelve-tooth detent wheel 126 (FIG. 8). However, since each of the associated selection slides 85 to 88 is limited to ten incremental steps of movement, only ten of the twelve detents are utilized.

A series of arcuately formed detent pawls 127 are rockably mounted on a shaft 128 (FIG. 8) extending transversely of the selector mechanism and supported at its ends in flanges 49 and 110 of channel member 27. Pawls 127 are equally spaced along shaft 128 in accordance with the ordinal spacing of the wheels 108 and each pawl is provided with a tooth-like projection 129 adapted for engagement between the teeth of the associated detent wheel 126. The free end of each pawl 127 is extended horizontally beyond tooth 129 and at its extremity secures one end of a spring 130 which is supported at its other end on a rod 131 extending transversely of the selector mechanism and secured at its ends in flanges 49 and 110 of channel member 27. Springs 130 serve to resiliently urge the teeth 129 of the respective pawls 127 into the appropriate tooth space in the corresponding detent wheels 126, thereby maintaining the wheels 108 in any selectively rotated position thereof and the associated selection slides in a differentially moved position.

Referring now to FIGS. 6, 8 and 10, it will be recalled that the laterally offset upwardly extended portion 115 of selection slide 84 includes a ten-tooth rack 120 enmeshed with the twelve-tooth pinion 121 carried by the wheel 108 associated with the ½¢ order of the selector mechanism. The degree of rotation of the ½¢ order wheel 108 differs from that of the other wheels 108 in that the ½¢ order wheel is limited to 150° counter-clockwise rotation from the position shown in FIG. 10, and return. As explained above, each 30° rotation of a selected wheel 108 imparts one increment of movement to the corresponding selection slide. Thus, 150° rotation of the ½¢ wheel 108 (FIG. 10) in a counter-clockwise direction imparts five increments of movement to selection slide 84, moving the corresponding pinion 66 to the right from the inactive position shown to a position wherein the longest tooth and four successively shorter teeth on actuator 56 become effective to impart five increments of movement to the square shaft 61. A two-position detent disk 132 is carried by the ½¢ wheel 108 and serves to limit the rotation of the wheel in either direction. Cooperating with the detent disk 132 is an arcuately formed detent pawl 133, similar to pawls 127, rockable on the shaft 128. Intermediate its ends, pawl 133 is provided with a tooth-like projection 134 which is resiliently urged by a spring 130 into a notch 135 or 136 in the periphery of the disk 132. The engagement of the tooth 134 in the notch 135 resiliently retains the ½¢ wheel 108 in the position shown in FIG. 10 and the corresponding selection gear 66 in its inactive position. The notch 136 is angularly displaced 150° in a clockwise direction from notch 135 and each notch is of a depth sufficient to provide a shoulder 137 and 138, respectively, which serves to limit the rotation of the ½¢ wheel 108. As the wheel 108 and disk 132 are rotated counter-clockwise (FIG. 10), the point of the tooth 134 of pawl 133 rides on the peripheral edge 139 of an arc having a radius less than that of the arc between the shoulders 137 and 138 so that as soon as the tooth 134 drops into notch 136, the shoulder 137 engages the edge of the tooth to prevent further rotation of the wheel. Similarly, as the wheel 108 is returned in a clockwise direction, the tooth 134 rides out of notch 136, and upon dropping into notch 135, the shoulder 138 engages the edge of the tooth, thereby limiting rotation of the wheel in that direction.

A selector register, generally indicated at 145 in FIGS. 1, 5, 6 and 8, is provided to visually indicate a value set up in the selection mechanism. The register 145 is comprised of four numeral dials 146 and a ½¢ numeral dial 147 rotatably mounted on a shaft 148 secured at its ends in the register cover 113. The dials 146 and dial 147 are maintained in ordinal spaced relationship on shaft 148 by means of spacers 149 and are aligned with the corresponding selector wheels 108. The cover 113 is formed in a semicircle above the dials 146 and 147 and is provided with a sight opening 150 for each of the dials. A decimal point 144 may be engraved or embossed on the register cover 113 between the sight openings 150 associated with the dials 146 of the tens of

cents order and the units of dollars order to enable an operator to more easily determine the order or orders in which the desired value is to be set. The register cover 113, together with the dials on the dial shaft 148, are secured to the top of the meter cover 46 by any suitable means, such as screws 151. Upon placement of the meter cover 46 on the body of the meter itself, the heads of the screws 151 are received in corresponding apertures 152 (FIG. 2) in the web of the channel member 27 so that the underside of the top of the cover 46 may rest flat against the web of the channel. The numerals "0" to "9" are angularly spaced 30° apart on the peripheral surface of each of the dials 146, while only two designations appear on the peripheral surface of the dial 147. A filigree, or series of wavy lines, appears on the peripheral surface of the dial 147 (FIG. 6) in what is to be considered the "0" position of the dial. Displaced 150° clockwise (FIG. 8) from the filigree, a "½" designation also appears on the face of the dial 147.

With each 30° rotation of a selector wheel 108 to a detented position thereof, the aligned register dial 146 receives a like rotation to indicate the desired value. Similarly, 150° rotation of the ½¢ wheel 108 from one detented position to the other will impart a similar rotation to dial 147 to the filigree indicating position or the "½" indicating position. Each of the dials 146 and dial 147 carries a twelve-tooth gear 153 concentric therewith and enmeshed with a horizontally disposed ten-tooth rack 154, which is formed at a right angle to the corresponding one of a series of ordinal slide bars 155 adjacent the rearward end thereof. A ten-tooth rack 156 is formed downwardly at a right angle to each bar 155 intermediate the ends thereof and meshes with the twelve-tooth gear 121 carried by the corresponding wheel 108. Each slide bar 155 lies flat against the upper surface of meter cover 46 (FIGS. 5, 6, 8, 9 and 10) and is guided for endwise movement in a respective channel in the register cover 113. Each of the channels is of a width and depth substantially that of the width and thickness of the corresponding bar 155 to prevent distortion of the bar during its operation. Inasmuch as the racks 120, 154 and 156 have an equal number of teeth and since each of the gears 121 and 153 are similar, each increment of rotation of a selected wheel 108 will impart a similar differential movement to the associated selection slide and slide bar 155. Thus, it becomes apparent that upon selective incremental rotation of a selector wheel 108, except the wheel 108 of the mills order, the value represented by the differentially moved position of the associated selection slide will appear in the corresponding dial 146. Similarly, upon rotation of the mills order wheel 108 from one extreme position to the other extreme position, the designation "½", or the filigree, will move into the sight opening 150 associated with dial 147.

Postage Indicia Printing Head

The selective adjustments of selector wheels 108 serves, not only to differentially adjust the associated selection slides and, therefore, the corresponding selection pinions, but also to adjust the corresponding type wheels in the postage indicia print head, or drum, generally indicated at 160 (FIG. 5), to print the value indicated in the selector dials 146 and/or dial 147. As explained supra, the die adjusting slides 89, 90, 91 and 92 are nested in juxtaposition within the U-shaped bracket 77. Each of the slides 89 to 92, inclusive, is mounted for endwise sliding movement, similarly to the selection slides 84 to 88, inclusive, by the provision of an identical slot 93 in the forward end thereof in engagement with the transverse rod 94 (FIG. 8) and two identical spaced-apart parallel slots 95 in the rearward end thereof in engagement with respective transverse rods 96. At the rearward end thereof, the die adjusting slides carry vertically extended fingers of graduated length, finger 161 of slide 89 (FIGS. 5 and 8) being the longest, while finger 162 of slide 90, finger 163 of slide 91, and finger 164 of slide 92 are each shorter by equal degrees. A notch is provided in the upper extremity of each of the vertically extended fingers 161, 162, 163 and 164 to receive the end portion of lateral extensions 165, 166, 167 and 168, respectively, each of which is formed at a right angle to an upwardly extended member of the respective selection slides 84, 85, 86 and 87. Thus, it becomes apparent that upon differential movement of a selected selection slide, a comparable movement will be transmitted to the corresponding die adjusting slide, e.g., if three increments of movement are imparted to selection slide 85, this slide becomes effective through the lateral extension 166 and finger 162 to transmit three increments of movement to the corresponding die adjusting slide 90.

Adjacent the forward, or left-hand, end thereof, each die adjusting slide 89, 90, 91 and 92 has a depending portion, the lower end of which is formed angularly downwardly therefrom and at its extremity is provided with a ten-tooth rack 172, 173, 174 and 175, respectively (FIGS. 5 and 8). The depending portion of the die adjusting slide 89 is the shortest, while that associated with each of the slides 90, 91 and 92 is successively longer, so that the racks 172, 173, 174 and 175 formed at the lower ends thereof, respectively, are equally spaced apart and in parallelism with each other. A similar ten-tooth rack 176 is formed at the lower end of the depending portion of selection slide 88 and is parallel to, and spaced from, the adjacent rack 175 a distance equal to the spacing between each of the other racks. The faces of the racks 172 to 176, inclusive, lie in a plane which is at a right angle to the lower ends of the depending portions of the die adjusting slides and is parallel with the slides. Each rack meshes with a corresponding one of a series of similar twenty-tooth gears, generally indicated at 181, rotatably mounted on a diagonally disposed shaft 177 and ordinally spaced-apart thereon in accordance with the spacing of the racks (FIGS. 5, 8, 14 and 15). Shaft 177 is supported adjacent its respective ends in spaced-apart parallel ears 178 and 179 formed at a right angle to a bracket 180 which is riveted, or otherwise secured by any suitable means, on the auxiliary intermediate bracket 44 carried by the auxiliary base 40. Each gear of a series of similar ten-tooth gears, indicated at 182, is meshed with the corresponding gear of the series of gears 181 and is also meshed with a corresponding gear of a series of similar ten-tooth gears, indicated at 183. The gears 182 and gears 183 are rotatably mounted on respective shafts 190 and 194 and are spaced on their respective shafts in accordance with the spacing between the gears 181. Each of the shafts 190 and 194 is axially parallel with the other and with shaft 177 and is secured at its respective ends in legs 191 and 192 of a bail 193. The bail 193 is rockable about the axis of the shaft 177, having the free end of its one leg 191 pivoted on the upwardly extended end of the shaft 177, adjacent supporting ear 178, and the other leg 192 thereof pivoted on the lower extended end of the shaft 177, adjacent supporting ear 179. The angularly extended end 195 of the leg 192 of bail 193 serves to impart a clockwise rocking movement to the bail 193, as viewed in FIG. 15, from an active to an inactive position against the urgency of a compression spring 196 secured at its one end on a pin on the auxiliary bracket 44 and at its other end on a pin on one leg of an angle bracket 197 secured on the lower face of the transverse portion 198 of bail 193. In the active position of the bail 193 (FIG. 15) an adjustment of the selection slide 84 imparts rotation to the corresponding gear train of the series of gears 181, 182 and 183 to effect a like adjustment of a ½¢ type die wheel 200 in the print head 160. Similarly, a differential adjustment of the selection slides 85 to 88, inclusive, is effective through the associated gear train of the series of gears 181, 182 and

183 to adjust a corresponding numeral type die wheel 201 in the print head 160 in accordance with the value set in the register 145.

Referring now to FIGS. 5, 15 and 16, an arcual printing die 205 is provided on its outer surface with suitable postage stamp indicia and is secured at its ends by any suitable means, such as rivets 206, on the outer peripheral surface of a semicircular plate 207. The plate 207, in turn, is detachably secured at one end by any suitable means, such as screws 208, on a substantially semicircular section 209 of a cylindrically formed cover plate, generally indicated at 210, and at its other end by similar screws 208 to a complementary arcuate section 211 of the cover plate 210. The sections 209 and 211, forming the substantially cylindrical cover 210, are supported between, and are retained in position by lugs, or locating ears, 212 extending outwardly beyond each edge of the sections 209 and 211 engaged in corresponding arcual slots 213 in each of disks 214 and 215. Ears 216, similar in dimension to ears 212, extend outwardly from each end of the web portion of a U-shaped type wheel carrier 217 and are adapted for engagement in arcual slots 218 in respective disks 214 and 215. The web portion of the U-shaped carrier 217 is in the form of an arc having the same radius as the sections 209 and 211 of the cover plate 210 and is interposed between adjacent ends of the sections 209 and 211 contiguous with the inner surface of plate 207, thereby positioning the ears 216 in the circle formed by these sections. Each of the ears 212 and 216 are of equal width and are substantially equally spaced-apart circumferentially. Similar lugs 221 extending outwardly from each edge of each of parallel legs 219 and 220 of the U-shaped carrier 217 are adapted for engagement in spaced-apart slots 222 in respective disks 214 and 215.

The type wheel 200 and type wheels 201 (FIGS. 5 and 15) are decagonal in form, type wheel 200 having a filigree, or series of wavy lines, embossed on one face thereof and a "½" embossed on the diametrically opposite face. One of the numerals from "0" to "9" is likewise embossed on each face of each of wheels 201 in consecutive order around the wheel. Type wheel 200 and wheels 201 are rotatably mounted on a shaft 228 secured at its ends, respectively, in legs 219 and 220 of U-shaped type wheel carrier 217 and correspond to the dial 147 and dials 146, respectively, provided in the selector register 145. The position of the shaft within carrier 217 is such that the numeral type wheel 200 and wheels 201 extend into similar aligned openings, forming aperture 232 in the web portion of the U-shaped carrier 217 and the semicircular plate 207 and further extend into an aperture 233 in the printing die 205. The size of each of the apertures 232 and 233 is sufficient only to permit rotation of the numeral type wheels therein and to permit the positioning of the wheels in the face of the printing die plate 205 so that the type thereon is flush with the printing surface of the indicia die. A bar (not shown) extends across the aperture 233 between the tens of cents and units of dollars numeral type wheels and is secured at its ends in the postage stamp indicia die 205. A decimal point is embossed on this bar and is positioned flush with the indicia die and numeral type printing surface.

A ten-tooth gear 229 (FIG. 15) is secured on one side of each of the type wheels concentric therewith and enmeshed with a corresponding twenty-tooth gear 230. The gears 230 are rotatably mounted in ordinal spaced relationship on a shaft 231 which is parallel with shaft 228 and is secured at its respective ends in legs 219 and 220 of the U-shaped type wheel carrier 217. In what is to be considered the full-cycle position of the print head 160, as viewed in FIGS. 5 and 15, the spring 196 urges bail 193 into the active position shown, moving the gears 183 into aligned rectangular slots within disk 214 for meshing engagement with the corresponding gears 230. Thereafter, for each incremental, or 30° rotation of a selector wheel 108, the corresponding gear 181 will impart a 36° increment of rotation to the type die wheel associated therewith, moving the desired type character thereon into printing position relative to the postage stamp indicia die 205. Thus, it becomes apparent that if the units of cents order dial 146 in the selector register 145, for example, is rotated from the "0" to the "6" position by the corresponding wheel 108, the differential movement of the associated selection slide 85 and corresponding die adjusting slide 90 will impart 108° of angular rotation to the corresponding twenty-tooth gear 181 and the units of cents numeral type wheel 201 will receive six increments or 216° of angular rotation to move the type numeral "6" to printing position. Upon cyclic rotation of the print head 160, an impression may then be taken therefrom in a manner to be hereinafter described.

Means are provided for resiliently retaining the numeral type wheel 200 and each of type wheels 201 in the desired adjusted printing position. For this purpose, each ten-tooth gear 229 has a detent pawl, or lever, 238 associated therewith and rockably mounted on a shaft 239 secured at its respective ends in legs 219 and 220 of the U-shaped type wheel carrier 217 (FIGS. 5 and 15). Each detent lever 238 is provided at its upper free end with a V-shaped nose 240 which is resiliently urged by a spring 241 into a position between two adjacent teeth of the associated gear 229 in each adjusted position of the corresponding type wheel. Each of the springs 241 is supported at its one end on a pin carried by each of the detent levers at the lower free end thereof and is secured at its other end on a rod 242 supported at its ends in legs 219 and 220 of the type carrier 217. Immediately prior to the rotation of the print head 160 in a counter-clockwise direction from the position shown in FIG. 5, means become effective to rock the bail 193 in a clockwise direction (FIG. 15) from its normally active position to an inactive position, wherein the gears 183 are disengaged from the gears 230 and become locked against rotation, thereby preventing further operation of the selector mechanism. The lower extended end of bracket 180 is formed outwardly at a right angle to the bracket providing a blade 245, the outer rounded edge of which is parallel to the axis of the shaft 194 and becomes effective, upon clockwise rocking movement of the bail 193, to engage between adjacent teeth on each of the gears 183, thereby centralizing these gears and locking them against further rotation.

When rocked to its inactive position, the bail 193 also enables the operation of mechanism to prevent release of the nose 240 of detent levers 238 from engagement with the teeth of the corresponding gears 229. A bar 246 of a bail, generally indicated at 247, extends transversely of the type wheel carrier 217 (FIGS. 5 and 15) and is supported at its ends by sectorial arms 248 and 249, respectively, similarly pivotally mounted at 250 on respective legs 219 and 220 of type wheel carrier 217. Each of two similar springs 251 is secured at its one end in respective apertures provided in bar 246 adjacent each end thereof and, at its other end, each spring 251 is supported on a rod 252 secured at its ends in legs 219 and 220 of carrier 217. Springs 251 normally urge bail 247 clockwise (FIG. 15) to a position wherein the leading edge 253 of bail arm 249 engages the inner surface of disk 214. The leading edge of the sectorial arm 248 is provided with a nose 254 which, in the clockwise rocked position of the bail 247, is positioned within an aperture 255 (FIG. 16) in disk 214. In the full-cycle position of the print head 160, as shown in FIGS. 5 and 15, a tooth-like projection 256 on the transverse portion 198 of the bail 193 enters the aperture 255 to engage the nose 254 of arm 248, thereby rocking bail 247 counter-clockwise against the urgency of the springs 251, as seen in FIG. 15. In this position of the bail 247, the detent levers, or pawls 238 are free to rock, thereby

enabling a selective adjustment of the corresponding numeral type wheels 200 and 201. However, when the bail 193 is rocked clockwise to its inactive position, springs 251 urge bail 247 in a clockwise direction and the bar 246 thereof moves into engagement with the concave end of an extension 257 on the lower end of each of the levers 238, thereby preventing further rocking movement of the levers 238 or rotation of the numeral type wheels 200 and 201.

In order that the print head 160 may be rotatable as a unit, the disks 214 and 215 are maintained in parallel spaced relation by the provision of similar spacer rods 262 having a tapped hole in each end thereof for receiving similar screws 263 (FIGS. 5 and 16). A pressure roller 264 extends transversely of the print head 160 between disks 214 and 215 and is journalled on one of the spacer rods 262 (FIG. 5) for rotation within an opening provided between the adjacent lower ends of section 209 and section 211 of the cover plate 210, for a purpose to be hereinafter described.

Drive Mechanism for Print Head

The printing head 160 is mounted for cyclic rotation with each machine operation and to this end is secured on, and is supported between, one end of each of two axially aligned shafts 265 and 266 (FIGS. 2, 3 and 12) for rotation therewith. The shaft 265 is provided with a flatted end portion forming a diametral rib 267 (FIG. 16) which is inserted in a slot of similar dimension, centered in disk 214 and riveted over to secure the disk 214 to the end of shaft 265. At its one end shaft 266 is provided with a similar diametral rib 267 (not shown) which is inserted in a similarly centered slot in disk 215 and is also riveted to secure the disk 215 to the end of the shaft 266. Thus, the print head 160 and shaft 266 will invariably rotate in cyclic timed relation with shaft 265. The shaft 265 is journalled at its one end adjacent printing head 160 in auxiliary intermediate bracket 44 (FIGS. 12 and 15) and at its outer end is journalled in a bushing 268 secured in auxiliary frame plate 43. The axially aligned shaft 266 is journalled in auxiliary frame plate 42 secured on sub-base 40 and in the front frame plate 24 of the meter unit adjacent disk 215 of the print head 160. The shafts 265 and 266 and the indicia printing head 160 carried thereby, revolve one complete cycle with each machine operation, moving the postage indicia die 205 from the normal inactive full-cycle position thereof shown in FIG. 5, in a counter-clockwise direction through the printing position. Single cyclic rotation of shaft 265 is effected through a gear 269 (FIGS. 2, 12, 17 and 33) meshing with a mutilated gear 270 driven from a source of power to be described later under the heading "Power Unit."

The gear 269 is keyed and secured on a hub 271 which is pinned on shaft 265, as seen in FIG. 12. A Geneva wheel 272 (FIG. 33) is provided with an arcuate portion 273 for cooperation with a mated arcuate depression in the periphery of a disk 274 which is also keyed and secured on the hub 271 adjacent gear 269. In the full-cycle position of the print head 160, the Geneva wheel 272 is effective to prevent rotation of shaft 265 until bail 193 (FIG. 15) has been rocked clockwise to its inactive position, wherein gears 183 are disengaged from corresponding gears 230 and the detent levers 238 are locked against further movement.

As stated above, bail 193 is normally urged by spring 196 to the active position shown in FIG. 15 and spring 196 also serves to maintain the extended arm 195 of leg 192 of the bail in engagement with an eccentrically mounted bushing 278 which is adjustably secured by a screw 279 on a bellcrank 280 (FIG. 14) secured on the lower end of shaft 177. An ear 281, formed at a right angle to one arm of bellcrank 280 (FIGS. 13 and 15), carries a spherical roller 282 which is normally urged by a relatively heavy spring 283 into an arcual depression in the periphery of a disk 284 and into a cam notch in the periphery of an adjacent disk 285. Disk 284 (FIGS. 12, 13 and 15) is secured on a hub pinned on shaft 265 and abutting the auxiliary bracket 44, while disk 285 is secured on one end of a sleeve 286, rotatable on shaft 265 and having a gear 287 and a cam disk 288 adjacently mounted and secured on the other end thereof. A collar 289 is pinned on shaft 265 abutting the side of the auxiliary bracket 44 opposite the hub of disk 284 to prevent any lateral displacement of the shaft 265. From the above description, it becomes apparent that the gears 183 can engage with the corresponding gears 230 in the full-cycle position only of the printing head 160 as determined by the engagement of the spherical roller 282 in the notches in each of disks 284 and 285.

In the centralized full-cycle position of the cams 284 and 285, rotation of the printing head 160 is precluded by the engagement of the arcuate portion 273 of Geneva wheel 272 with the depression in disk 274 (FIG. 33). Upon initiation of a meter operation, the Geneva wheel continues to prevent rotation of the printing head until the bail 193 is moved to its inactive position under control of the gear 287. One tooth is removed from gear 287 (FIGS. 18 and 19) providing an opening which, in the full-cycle position of shaft 265, becomes engaged by a wide tooth 294 of a gear 295 driven from the power unit, the width of the tooth 294 being equivalent to the space occupied by two adjacent teeth of the gear 295. Immediately upon counter-clockwise rotation of gear 287 (FIG. 18), or clockwise, as viewed in FIG. 13, the cam disk 285 becomes effective to immediately dislodge roller 282, thereby rocking bail 193 (FIG. 15) to its inactive position. It will be noted that the circular pitch of each of the gears 269, 270, 287 and 295 is identical. However, the pitch diameter of gear 270 is greater than that of the gear 269 with which it meshes and is provided with a mutilated portion which enables approximately 40° rotation of the gear 270 before the teeth thereon mesh with the teeth of the gear 269 to initiate rotation of the shaft 265. Due to the relative difference in the pitch diameters of the gears 269 and 270, shaft 265 will revolve at a faster speed than the gear 287 so that the cam disks 284 and 285 will be returned simultaneously to the full-cycle position shown in FIG. 13.

Means become effective under control of the cam disk 288 secured on sleeve 286 adjacent gear 287, to prevent operation of the selector mechanism and, under certain conditions to be described hereinafter under the heading "Ascending and Descending Registers," to prevent operation of the meter unit. A depending cam follower arm 296 (FIGS. 12, 17, 18 and 19) is secured at its upper end on one end of a sleeve 297 pinned on a shaft 298 intermediate its ends which are journalled, respectively, in auxiliary bracket 43 and intermediate bracket 44. At its other end, sleeve 297 carries an upwardly extended arm 299 and, adjacent arm 299, a bellcrank 300 is freely mounted for adjustment in an annular groove in sleeve 297. At its upper end, the vertically disposed arm of bellcrank 300 is secured to arm 299 by means of an eccentrically mounted bushing 301 and screw 302. The horizontal arm 303 of bellcrank 300 is provided with a knifed edge 304 extending transversely beneath selection slide 88 and die adjusting slides 89, 90, 91 and 92 for cooperation therewith (FIGS. 5 and 8). The lower edge of the rearward end portion of the selection slide 88 and each of the die adjusting slides 90, 91 and 92 is provided with nine teeth forming ten V-shaped notches 305, one notch for each differential position of the respective slides. The die adjusting slide 89 associated with the mills or ½¢ order is provided with but two V-notches 305, one in the position of the slide designated by the filigree in the register 145 and one in the ½¢ differentially moved position of the slide. In the inactive position of each of the slides, the knifed edge of the arm 303 is aligned with the leftmost notch in

the slides, as seen in FIG. 8. Thus, it becomes readily apparent that upon selective differential adjustment of one or all of the slides **88**, **89**, **90**, **91** and **92** and, upon the counter-clockwise rocking movement of arm **303** (FIGS. 18 and 19), the knife edge **304** engages in the corresponding V-slots **305**, thereby locking the respective slides against further movement. The rocking of bellcrank **300** counter-clockwise from its inactive to its active position (FIG. 19) is under the control of cam **288** secured to gear **287**. At its leftmost end, shaft **298** carries a vertically disposed arm **308** (FIGS. 5, 12 and 17), the upper end of which is formed inwardly at a right angle thereto and extends into an aperture in the rear frame member **25**. A spring **309**, secured at its one end in an aperture adjacent the upper end of arm **308** and at its other end on a pin on an arm **310** secured on one end of a shaft **311**, serves, under certain conditions, to urge a hook end **312** of arm **310** from the normally inactive position shown in phantom line in FIG. 17 into engagement with the formed-over end portion of arm **308**, as will be described hereinafter under the heading of "Descending and Ascending Registers." Spring **309** also serves to normally urge the V-shaped nose **313** of cam follower arm **296** into a similarly shaped notch in the periphery of the cam **288**, as seen in FIG. 18. Immediately upon counter-clockwise rotation of gear **287** and the movement of the bail **193** from its active to its inactive position (FIG. 15), cam **288** rocks arm **296**, moving the knife edge of the arm **303** of bellcrank **300** into the aligned V-notches in the slides **88** to **92**, inclusive. By virtue of the fact that the V-nose **313** of the follower arm **296** rides on the periphery of the cam **288** thereafter, any further movement of the selection slides is precluded.

It will be understood that the postage indicia printing head **160** always rotates cyclically in a counter-clockwise direction, as viewed in FIG. 5, and to ensure this directional rotation of the printing head **160**, an antibacklash spring **314** is employed (FIGS. 2 and 12). For one-half of its length, spring **314** encompasses the reduced diameter of a collar **315** which is freely mounted on shaft **265** but is held against rotation by the engagement of diametrically opposed dogs **316** thereon engaged in corresponding slots in the inner flange of bushing **268**. The other half of spring **314** encompasses the reduced diameter of one end of a collar **317** which is mounted on shaft **265** for rotation therewith by the engagement of the respective ends of a diametrically extended pin **318** in shaft **265** in diametrically opposed notches in the right end of the collar **317** (FIGS. 2 and 12). As viewed from the right in FIG. 2, the spring **314** is wound clockwise about the reduced end portions of the collars **315** and **317** compressed between the shoulders on each collar, thereby enabling freedom of rotation of shaft **265** and the postage indicia printing head **160** in a counter-clockwise direction, as viewed in FIG. 5. However, inasmuch as the inside diameter of the spring **314** is only slightly greater than the outside diameter of the reduced ends of the collars **315** and **317**, any attempt to rotate shaft **265** in a clockwise direction tends to immediately tighten spring **314**, thereby preventing rotation of the shaft in that direction.

Each cyclic counter-clockwise rotation of the shaft **265** and postage indicia printing head **160** also effects a similar rotation of the shaft **266** (FIGS. 2, 3, 5 and 12) having a driving connection with the actuator shaft **58**. Shaft **58** is driven in synchronism with the printing head **160** and to this end each of the shafts **266** and **58** carries similar toothed pulleys **322** and **323**, respectively, secured on the outer end thereof. A timing belt **324** rides on pulleys **322** and **323** to transmit rotation from shaft **265** and therefore shaft **266** to actuator shaft **58** in a counter-clockwise direction, as viewed in FIG. 3.

Descending and Ascending Registers

With each operation of the meter, the numerical value of the printed postage indicia is subtractively registered in a descending, or subtracting, counter and is additively registered for accumulation in an ascending, or total, counter so that the ascending register will show at any time the aggregate value of the postage impressions which have been made, and the descending register will show the balance of prepaid postage which may still be used. Upon cyclic rotation of actuator shaft **58**, the actuators **56** and **57** become effective to cause a subtractive registration and an additive registration, respectively, of the desired amount of postage indicated in register **145** in the descending register, generally indicated at **325** (FIGS. 2, 6 and 7), and the ascending register, generally indicated at **326**. It will be understood that any desired number of orders may be provided in each of the registers **325** and **326**. However, in the embodiment shown, the descending register **325** is provided with seven orders having a capacity of $9999.99½, while the ascending register **326** is provided with eight orders having a capacity of $9999.99½ (FIG. 2).

Register **325** is assembled as a unit and is supported in the meter between the forward and rearward frame plates **24** and **25** by the cover **26** which is held in place thereon by any suitable means, such as screws **28** (FIG. 2). Register **326** is also constructed as a unit similarly to that of register **325** and is supported within the framework of the meter by means of a cover plate **327** (FIGS. 2, 6, 7 and 17), secured at its ends to respective frame plates **24** and **25** by any suitable means, such as screws **328**. The construction of each of the registers **325** and **326** is identical and it is, therefore, believed that a description of one register will suffice for both. Similar parts in each register will bear the same reference numeral except that in the showing of register **326**, the suffix "A" will be added.

The descending register **325** is comprised of six similar indicating dials **329** and a ½¢ dial **330** ordinally spaced axially for rotation on a shaft **331** supported along its length and at its ends in each of a series of similar separator plates **332** which are equally spaced along the shaft in accordance with the ordinal spacing of the dials **329**.

Each of the separator plates **332** is provided with a pair of lateral projections **335** (FIGS. 6, 7, 21 and 22) which are inserted in corresponding open end slots in the register supporting plate **26** to maintain the separator plates in their ordinal spaced relationship. A pair of similar ears **336** is also carried by each separator plate **332** and extend through corresponding slots in the upper portion of the register supporting plate **26** (FIGS. 2, 7, 21 and 22). Each of the ears **336** extends above the supporting plate **26** and is provided with an aperture, which apertures, in the ordinally adjacent ears **336**, are axially aligned for the insertion therethrough of one of a pair of similar rods **337**. The rods **337** are parallel and serve to secure the separator plates **332** on the supporting plate **26**. Similarly, separator plates **332A** are maintained in ordinal spaced relationship by the insertion of similar ears **335A** into corresponding notches in register cover plate **327** and are secured on plate **327** by the passage of one of a pair of similar rods **337A** through aligned apertures in ordinally adjacent ears **336A**.

The peripheral face of each of the dials **329** is engraved with the numerals "0" to "9" equiangularly spaced thereabout, while a series of wavy lines or filigree is engraved on the peripheral surface of the mills or ½¢ order dial **330**, in the position of the dial corresponding to the "0" position of the dials **329**. Displaced angularly 180° from the filigree, a "½" is also engraved on the face of the dial **330**.

It will be understood that if it should become desirable to do so, the ½¢ dial **330** may be replaced with a full cent dial similar to dials **329**, thereby increasing the capacity of the descending register **325**. If this change should be made in the register, it will also become necessary to provide the

corresponding die adjusting slide 89 with ten V-notches 305 therein instead of the two notches, as shown in FIG. 9. At the same time, it will become necessary to replace the numeral type wheel 200 with a numeral type wheel similar to wheels 201, having the numerals "0" to "9" embossed thereon.

Each of dials 333 and ½¢ dial 334 of the series of dials in the ascending register 326 are equally spaced-apart for rotation on a shaft 331A and are ordinally arranged thereon in accordance with the ordinal spacing of the dials 329 and dial 330 in the descending register. While the ½¢ dials 330 and 334 are identical, the dials 329 and 333 are dissimilar in one respect. As will be described, the dials in each of the registers 325 and 326 invariably rotate in a counter-clockwise direction, as viewed in FIGS. 6 and 7. Thus, the engraving of the numerals "0" to "9" on the peripheral face of the dials 329 is in a counter-clockwise direction, while the numerals from "0" to "9" are engraved in a clockwise direction on the face of the dials 333. Therefore, it can be seen, that upon rotation of both series of dials 329 and 333 in the same direction, a value registered in the dials 329 will be of a subtractive sign character, while the same value registered in the dials 333 will be of an additive sign character. A visual indication of a value in the dials of the register 325 may be viewed from the top of the meter through a window 338 secured on an apertured plate 478 slidably mounted within register cover 113 (FIG. 6), an aperture 345 in meter cover 46 and through sight openings 339, ordinally spaced-apart within an embossed portion 340 of the register supporting plate 26. Similarly, an accumulated value is visually indicated in the dials of the register 326 through ordinally arranged sight openings 341 in an embossed portion 342 of the register supporting plate 327 and may be viewed from the right end of the meter through an elongated aperture 344 in meter cover 46 and a window 343 secured to the surface of the raised portion 342 over the sight openings 341. Each of the windows 338 and 343 may be made of any suitable transparent material, such as glass or a thermoplastic. In order to prevent any noise resulting from vibration or chafing from metal-to-metal contact, the aperture 345 in the top of the meter cover 46 is sufficiently larger than the embossed portion 340 of the register plate 26 to provide clearance therearound. Similarly, any contact of the window 343 with the inner surface of the cover 46 surrounding the aperture 344 is avoided by the insertion of a suitable insulating material 346, such as felt, between the window and the meter cover.

It will be recalled that when the desired amount of postage has been entered in the selector mechanism by selective operation of wheels 103, the amount is indicated in the dials of the selector register 145 and the corresponding selection slides 84 to 88, inclusive, and the associated die adjusting slides 89 to 92, inclusive, will have been differentially adjusted in accordance with the value indicated in register 145. With the adjustment of the selected slide or slides 84 to 88, inclusive, the associated selection gear or gears 66 to 70, inclusive, will be differentially positioned relative to the corresponding actuator 56, 57 for meshing engagement with a number of teeth thereon equivalent to the value appearing in the ordinal dial of the register 145 and represented by the differential adjustment of the selection slide in that order. Similarly, each adjusted selection slide is effective to impart rotation to the corresponding type wheel 200 or type wheels 201 to move the number thereon, as indicated by the corresponding ordinal dial in register 145, into printing position. In each cyclic operation of the meter unit, each increment of rotation imparted to selection gears 66, 68 and/or 70 by the corresponding actuator 56, or to gears 67 and 69 by the corresponding actuator 57, is transmitted by means of respective square shafts 61, 63 and 65, and 62 and 64, respectively, to the registers 325 and 326.

Each of the square shafts 61, 62, 63, 64 and 65 (FIGS. 6 and 10) carries a ten-tooth gear 350, 351, 352, 353 and 354, respectively, secured thereon and each gear is displaced axially on its respective shaft from the adjacent gear on the adjacent square shafts a distance equal to the ordinal spacing of the dials in each of the registers 325 and 326. A series of ordinally spaced idler gears 355 are rotatably mounted on shaft 58 and each of the idler gears is enmeshed with the corresponding one of the ordinally arranged gears 350 to 354, inclusive. A series of similar ten-tooth gears 356 are journalled in ordinal spaced relationship on a shaft 357 extending longitudinally of the register 325, parallel with shafts 58 and 331, and supported along its length in the separator plates 332. Each of the ten-tooth gears 356 is adapted to mesh with the corresponding idler gear 355. A similar series of ten-tooth intermediate gears 356A are rotatably mounted on a shaft 357A extending longitudinally of the register 326 in parallelism with shafts 58 and 331A and journalled in suitable apertures in each of the separator plates 332A. The corresponding ordinal ten-tooth gears 356 and 356A are enmeshed with the same ordinal idler gear 355 and therefore receive the same incremental angular rotation transmitted by the gear 355.

Upon adjustment of selection gear 66 to active position and cyclic operation of actuator 56 (FIGS. 6 and 10), five increments of movement are imparted to dials 330 and 334 of respective registers 325 and 326 through gear 350 and associated gears 355, 356 and 356A. Similarly, each increment of movement imparted to shafts 62 to 65, inclusive, is transmitted through respective gears 351 to 354, inclusive, and the associated gears 355, 356 and 356A to effect a registration in the corresponding dials 329 and 333 of the respective registers 325 and 326. The rotation of each of the dials 329 and dial 330 and each of the dials 333 and the dial 334 is under the control of a similar ratchet clutch, generally indicated at 358 in FIGS. 21, 23 and 24. Dial 329 is preferably molded of a thermoplastic and comprises a central hub 359 extending outwardly from a web portion 360 having a cylindrical flange 361 integral therewith. Ten equiangularly spaced teeth 362 are provided on the internal peripheral surface of the flange portion 361 and therein form ten V-shaped notches, one for each of the numerals on the external peripheral surface of the dial. The driving member 366 of the ratchet clutch 358 is also preferably formed of a thermoplastic and carries a ten-tooth gear 367 integrally formed therewith in the outer surface of a flange portion 393. The outside diameter of the gear 367 is equal that of the flange portion 393. Driving member 366 is freely mounted on the central hub 359 of the dial 329, enabling rotation of the dial independently of the member 366. The ten-tooth gear 367 meshes with the corresponding ordinal ten-tooth gear 356 which is driven by the associated idler gear 355. Thus, it can be seen that each increment of rotation imparted to each of the square shafts 61 to 65, inclusive, will effect a like increment of rotation to the gear 367 associated with the corresponding ordinal dial. To impart impetus to the dial wheel 329, the driving member 366 is provided with a hub portion 368 which is received within the circular channel provided in the numeral wheel 329. The inside diameter of the circular channel within dial 329 is determined by the vertices of the ten teeth 362. The hub portion 368 of driving member 366 has two slots, or channels, 369, each of which is open at one end and provides a guide-way for the reciprocation of respective pawls 370. The pawls 370 are adapted to cooperate with the ratchet teeth 362 of the numeral wheel dial 329 in a manner such that, when the driving member 366 is driven in a clockwise direction (FIGS. 21 and 24), or a counter-clockwise direction (FIG. 6), the dial, or numeral wheel, 329 will rotate therewith. However, during a tens-transfer phase of cyclic operation, the numeral wheel dial 329 may be rotated independently of the driving member 366 in the same direction as it was driven

by the member 366, which member 366 becomes locked against rotation following the digitation phase of the cycle.

The channels 369 in the hub portion 368 of the driving member 366 are parallel and are disposed on chords equally spaced from the axis of the member 366. The open ends of the channels 369 are at diametrically opposite points on the periphery of the hub portion 368. A lug 371 is formed on the longer of the two walls of each slot, or channel, 369 adjacent the open end thereof and is engaged in a recess 372 in the ratchet pawl 370 to limit the reciprocating movement thereof. The pawls 370 are generally rectangular in cross-section to conform with the rectangular cross-section of the slots in which they are slidable and are urged outwardly by a compression spring 373. The outer end of each pawl 370 is rounded and is urged by associated spring 373 into engagement with the corresponding tooth of the numeral wheel dial 329 for driving relation therewith. The outer end of each pawl is also suitably curved from the rounded nose to the point of tangency with one side thereof to enable the pawls to ratchet over the teeth 362 when the numeral wheel 329 is rotated independently of the gear member 366 during the tens-transfer phase of an operation, or for any other purpose.

Each of the dials 329 and the dial 330 are centralized following the digitation phase in each cycle of meter operation, the dials 329 being centralized in any one of the ten positions thereof, while dial 330 is centralized in either of its two positions. For this purpose, the web portion 360 of the numeral wheel dial 329 extends outwardly at a reduced diameter and carries a ten-tooth gear 378 (FIGS. 6, 22 and 23) of a similar outside diameter integrally formed thereon. The ten-tooth gear 378 of the numeral wheel dial 329 cooperates with a V-shaped nose 379 on the angularly downwardly formed end of a detent lever 380 pivoted at 381 (FIGS. 6 and 7) on the adjacent separator plate 332 (FIG. 20). The nose 379 of the detent lever 380 is resiliently urged by means of a torsion spring 382 between the teeth of the associated gear 378 in each registering position of the dial 329 and, during rotation of the dial 329 from one registering position to another, the nose 379 of lever 380 ratchets over the teeth of the gear 378. The spring 382 is wound counter-clockwise about pin 381 (FIGS. 6 and 7), having its one end formed to overlie the top of one arm of lever 380 and the other end formed to overlie the upper edge of the adjacent separator plate 332. The other arm 383 of lever 380 is provided at its free end with a V-shaped nose 384 which becomes effective following the tens-transfer phase of an operation to prevent overrun of the corresponding gear 378 and dial 329, as will be described hereinafter under the heading "Tens-Transfer Mechanism." The dials 333 and dial 334 of the register 326 are driven from the ordinally arranged idler gears 355 and intermediate ten-tooth gears 356A through ordinal ratchet dial clutches similar to the clutches 358 of the register 325. Likewise, the dials of the register 326 are centralized in their registering position by detent levers 380A similar to levers 380 and the V-shaped nose 379A thereof engaging between the teeth of the corresponding ten-tooth gears 378A.

Tens-Transfer Mechanism

As in the case of the registers 325 and 326 the tens-transfer mechanism associated with each register is identical in construction. It is, therefore, believed that a description of the tens-transfer mechanism, generally indicated at 390 (FIGS. 21 and 22) and associated with the register 325 will suffice for both. It will be understood that similar parts of the tens-transfer mechanism, generally indicated at 391, for the register 326 will carry the same reference numerals as those of the tens-transfer mechanism 390 with the suffix "A" added.

It will be remembered that the numeral wheel dials in each of the registers 325 and 326 revolve in a counter-clockwise direction only, as viewed in FIGS. 6 and 7, registering subtractively in the descending register 325 and additively in the ascending register 326. It will also be remembered that the dial 330 and dial 334 of the respective registers 325 and 326 has but two registering positions, the "0" position represented, or indicated, by a filigree, or series of four wavy lines, and the ½¢ position. Upon passage of the dial 330 from the "0" indicated position to the "½" registering position, the next higher, or unit cents, order dial 329 will partake of one-tenth of a complete revolution subtractively whereas, upon rotation of dial 334 in the ascending register from the "½" registering position to the "0" indicated position, one-tenth of a complete revolution will be imparted additively to the next higher, or unit cents, dial 333. In the same manner, following each complete rotation of a lower order dial 329, or 333, i.e., upon passage of the dial 329 or 333 from "0" to "9" or "9" to "0," respectively, the next higher order dial will receive one-tenth of a complete rotation.

To this end ten equiangularly spaced gear teeth 392 (FIGS. 20, 21 and 23) are provided on the outer edge of the flange portion 361 of dial 329 molded integrally therewith, or otherwise formed thereon. The peripheral edge of the flange 393 on the driving gear member 366 of the clutch 358 provides the bottom of the spacing between the gear teeth 392. Cooperating with the teeth 392 on the numeral wheel dial 329 is a single tooth tens-transfer actuator 394 which becomes effective during the tens-transfer phase of each cycle of meter operation, following rotation of dial 330 from the "0" indicated position to the "½" indicating position or passage of the next lower dial 329 from its "0" to "9" position, to impart an increment of rotation to the next higher order dial. Since there is never a tens-transfer into the mills, or ½¢, order dial 330, only the higher orders are provided with a single tooth tens-transfer actuator 394.

Each of the single tooth actuators 394 is carried on a hub 395 slidably and nonrotatably mounted on a square shaft 396, which shaft is provided at its respective ends with similar bushings 397 journalled in similar bearings 398, secured in respective frame plates 24 and 25. In its normally inoperative position, the single tooth tens-transfer actuator 394 is to the left of, and adjacent, the corresponding ordinal separator plate 332 (FIG. 20). The hub 395 of the tens-transfer actuator 394 extends to the right thereof through an aperture 399 in the adjacent separator plate 332 (FIGS. 20 and 21). Each of the hubs 395 is extended to provide a conical disk 400 which serves to control a lateral movement of the corresponding single tooth tens-transfer actuator 394. The conical disk 400 becomes effective under the control of a lower order dial to move the associated single tooth gear 394 into the plane of the teeth 392 on the higher order numeral wheel dial for engagement therewith. On passage of the dial 330 from its "0" indicated position to the "½" position, or of the dials 329 from their "0" to the "9" position, means controlled thereby become effective to move the corresponding single tooth gear 394 into position for engagement with the teeth 392 on the next higher order dial 329 to impart one increment of rotation thereto. For this purpose, a tens-transfer yoke 401 (FIGS. 6, 7, 20, 21 and 22) is provided for each order of the register except the highest order. Each of the tens-transfer yokes 401 is ordinally arranged for rocking movement on a transverse shaft 402 extending transversely of the register 325 parallel with shafts 331 and 396. Shaft 402 is supported along its length in the ordinal separator plates 332 and is secured at its respective ends in the end separator plates. An aperture 406 is formed in the yoke 401 encompassing the conical disk 400 and along the lower inner edge thereof the yoke 401 carries a tooth 407 extending into, and angularly outwardly of, the aperture 406. The tooth 407 cooperates with the left-hand surface of

the disk 400 (FIG. 20) to move the tens-transfer actuator 394 to the right to its inactive position when the yoke 401 is rocked in a clockwise direction, as seen in FIG. 21. Similarly, a camming tooth 408 is secured to the yoke 401 along the inner edge of the aperture 406, substantially diametrically opposed to the tooth 407. The tooth 408 cooperates with the right-hand surface of the disk 400 (FIG. 20) to move the associated single tooth gear 394 to the left into position for engagement with the teeth 392 of the corresponding higher order dial 329, when the yoke 401 is rocked in a clockwise direction to its active position, as viewed in FIG. 22. Upon the occurrence of a tens-transfer, i.e., when a lower order dial passes from "0" to "9" in register 325, or a lower order dial passes from "9" to "0" in the register 326, a tens-transfer tooth 409 (FIGS. 6, 7 and 22), carried by the lower order dial, engages with an inclined surface of a tooth 410 extending beyond the outer edge of the corresponding yoke 401 to rock the yoke 401 in a clockwise direction (FIG. 22) to its active position. Thereupon, the inclined surface of the tooth 408 on the yoke 401 becomes effective to move the associated conical disk 400 and single tooth gear 394 into the rotational plane of the teeth 392 on the next higher order dial.

As seen in FIGS. 6 and 7 in the "0" position of the dials 329 and dial 330, the tens-transfer tooth 409 becomes effective during the first increment of counter-clockwise rotation of the dial to rock the corresponding yoke 401 clockwise to its active position. Similarly, during the increment of counter-clockwise rotation of a dial 333 of the register 326 from the "9" to the "0" position, the tens-transfer tooth 409A, by its engagement with the tooth 410A of the corresponding yoke 401A, rocks the yoke clockwise to its active position. The yoke 401 is guided in its movement from its inactive to its active position, or vice versa, by the engagement of outwardly extended spaced-apart ears 411 and 412 of yoke 401 in respective slots in the register supporting plate 26. The tooth-like ear, or projection, 411 extends above the plate 26 and cooperates with the V-shaped nose of a leaf spring 413 to resiliently maintain the yoke 401 in either of its two positions. The ordinally arranged leaf springs 413 may be constructed of any suitable spring material, such as beryllium copper, and are integrally formed on a longitudinally extended strap 414 secured on the supporting plate 26 by any suitable means, such as rivets 415 (FIG. 2).

Immediately upon each cycle of meter operation, the square shaft 396 rotates for approximately 48° in a counter-clockwise direction, as viewed in FIG. 21, to restore each of the tens-transfer yokes 401 which may have been moved to active position during the previous cycle of operation or during the manual adjustment of the descending register 325 to be described hereinafter. For this purpose, the lower edge surface 416 of tooth 408 is arcuately formed and is of sufficient thickness to provide an adequate contact area for engagement by a camming tooth 417 (FIGS. 20 and 21) carried by the outer end of each hub 395 and formed integral with the conical disk 400. The leading edge of the tooth 417 is arcuately formed to conform with the arcuate edge surface 416 of the tooth 408. When a yoke 401 is in its detented active position and the square shaft 396 is in its full-cycle position, the leading edge of the corresponding tooth 417 is in contact with the lower edge surface 416 of the tooth 408 so that, immediately upon counter-clockwise rotation of the shaft 396, the tooth 417 restores the yoke 401 to its inactive position (FIG. 21) where it is held by the associated detent leaf spring 413.

As explained above, the initial 24° rotation, approximately, of the shaft 396 serves to immediately restore each tens-transfer yoke 401 from its active to its inactive position, if rendered active during the preceding cycle. Rotation of shaft 396 is then terminated to enable the digitation phase of the cycle of operation.

It will be recalled that the actuator shaft 58 (FIGS. 6, 10, 11 and 17) is driven by the main driving shaft 265 through toothed pulleys 322 and 323 and timing belt 324 (FIG. 3). Each complete cycle of rotation of shaft 265 imparts a single cycle of rotation to shaft 58 and actuators 56 and 57. In the initial part of each cycle of meter operation and approximately 24° before the actuators 56 and 57 become effective to selectively impart a possible nine increments of rotation to the square shafts 61, 62, 63, 64 and 65 successively in that order, a pair of juxtapositioned gear wheels 420 and 421 (FIGS. 2, 10 and 17), secured on the outer rearward end of shaft 58, serve to impart approximately 48° counter-clockwise rotation (FIG. 17) to each of gears 422 and 422A secured on the outer end of square shaft 396 and 396A, respectively. It will be noted that a portion of the teeth have been removed from the gear wheels 420 and 421 so that the respective gears 422 and 422A receive a full cycle of rotation for approximately 180° of each cycle of rotation of wheels 420 and 421. A wide tooth 423 and 423A of a width equal to that of the width of three of the gear teeth, is provided on each of the respective gears 422 and 422A. The teeth 423 and 423A provide a dwell which, during the initial rotation of the gear wheels 420 and 421 and the respective gears 422 and 422A, moves into contact with the peripheral surface of the toothless portion of the wheels. The gears 422 and 422A thereafter become locked and further rotation to shafts 396 and 396A is precluded until after the digitation phase of the cycle.

Immediately following rotation of the wide teeth 423 and 423A into the toothless portion of the respective gear wheels 420 and 421, a three-arm locking lever 424 becomes effective to positively lock gears 422 and 422A against further rotation. Locking lever 424 (FIG. 17) is pivotally mounted on a stud 426 secured on the frame member 25 and, at its end, each of two symmetrical arms of lever 424 is provided with a V-shaped nose 425 and 425A, respectively. Adjacent its end, the third arm 423 of three-arm lever 424 carries a roller 429 which is engaged in a cam groove 427 in gear wheel 421. Substantially simultaneously with the movement of the wide teeth 423 and 423A into the toothless portion of the respective gear wheels 420 and 421, the cam groove 427 in wheel 421 becomes effective to rock locking lever 424 in a clockwise direction (FIG. 17), moving the nose 425 into a notch 430 provided in a disk 431 secured on gear 422 and moving the nose 425A into a notch 430A in the periphery of the disk 431A secured on gear 422A. Further rotation of the gears 422 and 422A is thereafter precluded until lever 424 is restored to the position shown in FIG. 17.

Following the locking of the transfer shafts 396 and 396A against rotation, the digitation phase of the cycle of meter operation begins, wherein the series of teeth 59 and 60 on respective actuators 56 and 57 become effective to impart selected increments of rotation to the selection shafts 61 to 65, inclusive. For example, if the selection gear, or pinion, 66 is moved to the left on shaft 61 (FIG. 4) the extent of its movement relative to actuator 56, five teeth of the series of teeth 59 become effective to impart five increments of rotation to the shaft 61. Similarly, if selection gear 67 is moved along shaft 62 to the left to its extreme position relative to actuator 57, nine teeth of the series of teeth 60 will impart nine increments of rotation to the shaft 62. Upon rotation of actuators 56 and 57 in a counter-clockwise direction (FIG. 6), the incremental rotation of shaft 61 is terminated first, followed by the termination of the incremental rotation of shaft 62, etc., with rotation of shaft 65 terminating lastly. As seen in FIG. 4, it will be noted that the last tooth of the series of teeth 59 and 60 to be effective is the longest of each series of teeth so that irrespective of the differential setting of the selection gears relative to their respective actuators, rotation of the corresponding square shafts is invariably terminated during the same part of each cycle.

In the normally inactive, of full-cycle, position of the actuators **56** and **57**, each of the square shafts **61** to **65**, inclusive, is centralized and locked against rotation. Therefore, the corresponding ratchet dial clutches **358** are likewise locked against rotation. In order to lock the square shafts **61** to **65**, inclusive, against rotation, a ten-tooth star wheel **436** (FIGS. 10 and 11) is secured on each shaft near the end thereof and adjacent the inner surface of the frame plate member **24**. A series of radially disposed pins **437**, substantially rectangular in cross-section, are slidably mounted within an arcuate retainer **438** secured in the inner face of frame plate member **24**. The outer end of each of the radially disposed pins **437** is substantially V-shaped and is adapted for engagement in a notch in the associated star wheel **436** in each rotated position of the wheel. The inner end of each pin **437** is rounded and is adapted for engagement by the peripheral surface **439** of a disk **440** keyed on actuator shaft **58**. The radius of the peripheral surface **439** of the disk **440** is only slightly less than that of the inner surface of the arcuate retainer **438**, so that in the full-cycle position of the parts, as seen in FIG. 11, the pins **437** are held in their outwardly moved position with the outer noses thereof engaged in a notch of the corresponding star wheels **436**, thereby locking the square shafts **61** to **65**, inclusive, and the corresponding ratchet clutches **358** against rotation. However, disk **440** is provided with a recess, or depression, **441** in the periphery thereof, which is of a depth sufficient to permit pins **437** to be moved inwardly upon rotation of the associated star wheels **436** and is of a length sufficient to permit a complete rotation of each star wheel.

In the first part of each cycle of meter operation, the leading end of the recess **441** in the periphery of the disk **440** is rotated counter-clockwise (FIG. 11) to a position beyond the end of the pin **437** associated with the star wheel **436** on shaft **61**. Rotation may then be imparted to shaft **61** when the associated star wheel **436** becomes effective to cam the corresponding pin **437** inwardly. Similarly, upon further counter-clockwise rotation of the disk **440**, the leading end of the recess **441** moves to a position beyond the pin **437** cooperating with the star wheel **436** on shaft **62** to permit a possible nine increments of rotation of the shaft **62**. The rotation of the shafts **63**, **64** and **65** is enabled successively in a similar manner. Upon termination of the rotation permitted shaft **61**, the inclined trailing end **443** of the recess **441** becomes effective to cam pin **437** outwardly to engage its outer end in a notch of the star wheel **436** in any selectively rotated position thereof. Similarly, the inclined end **443** of the recess **441** becomes effective successively to lock each of the other shafts **62**, **63**, **64** and **65** in their selectively rotated position. Hence, each of shafts **61** to **65**, inclusive, is released seriatim to receive increments of rotation, and immediately following rotation imparted thereto, become locked and remain in their locked condition to the end of the meter cycle.

It will be understood that the digitation phase of each cycle of meter operation is concluded after approximately 200° of the cycle, whereupon the cam groove **427** in gear wheel **421** becomes effective to release the locking lever **424** (FIG. 17) from its engagement with the disks **431** and **431A**, thereby enabling rotation of the respective shafts **396** and **396A** to effect operation of the tens-transfer mechanism in each of the respective registers **325** and **326**. It will be recalled that during the digitation phase of each cycle of operation and upon rotation of the dial **330** from its "0" indicated position to the "½" position, or a lower order dial **329** in the descending register **325** from its "0" to its "9" position, the corresponding tens-transfer yoke **401** is rocked clockwise (FIGS. 6, 7 and 22) to its active position, wherein the associated single-tooth tens-transfer gear **394** is moved into position to impart an increment of rotation to the next higher order dial. Similarly, upon rotation of the dial **334** of the ascending register **326** from its "½" to "0" indicated position and upon rotation of a lower order dial **333** from its "9" to "0" position, the corresponding tens-transfer yoke **401A** is rocked clockwise to actively position the associated single-tooth tens-transfer gear **394A** to effect an increment of rotation to the next higher order dial. During the clockwise rotation of the gear wheels **420** and **421** (FIG. 17) and at the conclusion of the digitation phase of the cycle, the roller **429** moves into that portion of the cam groove **427** having the greater radius, thereby rocking lever **424** counter-clockwise to release the noses **425** and **425A** from engagement with respective notches **430** and **430A**. Immediately thereafter, a broad tooth **444** of gear wheel **420** and a broad tooth **445** of gear wheel **421** engage the wide tooth **423** and **423A**, respectively, of the gears **422** and **422A** to effect rotation of the respective tens-transfer shafts **396** and **396A**. The teeth **444** and **445** and the respective teeth **423** and **423A** are of an additional width to more capably withstand the shock load incident to the engagement thereof following the digitation phase of the cycle.

Referring to FIG. 25, each of the single-tooth tens-transfer gears **394** is diagrammatically illustrated as being viewed from the right in FIG. 20 and are arranged in ordinal sequence from right to left in the top row and from left to right in the lower row. It will be recalled that each single-tooth transfer gear **394** is normally inactively positioned to the left of, and contiguous with, the adjacent separator plate **332** (FIG. 20) while the hub **395** and conical disk **400** associated therewith extends to the right through an aperture in the separator plate **332**. When a tens-transfer is effected by a lower order dial, the corresponding single-tooth gear **394** is moved to the left into position for engagement with the gear teeth **392** on the adjacent higher order dial. It will also be recalled that in the initial 24° of each cycle of meter operation, the tens-transfer shafts **396** and **396A** turn approximately 48° clockwise, as viewed in FIGS. 6 and 7, or counter-clockwise, as viewed in FIG. 25, to restore any or all of the tens-transfer yokes **401** or **401A**, which may have been moved to active position during the preceding cycle. Thus, each of the single-tooth tens-transfer gears **394** is advanced 48° in a counter-clockwise direction, as viewed in FIG. 25, and remain in this position until initiation of the tens-transfer phase of the operation. The single tooth on each of the tens-transfer gears **394** is angularly displaced clockwise approximately 30° from the tooth of the adjacent lower order gear **394**. If each of the tens-transfer gears is moved to its active position during the digitation phase of an operation, the gear **394** associated with the first, or lowest, order tens-transfer mechanism will become effective in the adjacent higher order in approximately 10° following the initiation of the tens-transfer phase of the operation. In each subsequent 30° of rotation of the shaft **396**, each succeeding higher order dial will receive an increment of rotation, thus the tens-transfer is effected seriatim from the second lower order dial (FIG. 20) to the highest order dial. It is, therefore, possible to effect a tens-transfer into a higher order dial, which tens-transfer is the result of a tens-transfer into the adjacent lower order dial. As explained hereinbefore, the operation of the ascending register **326** is identical to that of the descending register **325** and the tens-transfer mechanism associated with the register **326** also functions in a manner similar to that of the tens-transfer mechanism associated with the register **325** with one exception, a transferred increment of rotation to each higher order dial in the descending register **325** is of a subtractive sign character while each transferred increment of rotation in a higher order dial of the ascending register **326** is of an additive sign character.

It will be recalled that immediately following the digitation phase of an operation, the detent pins **437** (FIG. 11) are effective to lock respective shafts **61** to **65**, inclusive, against rotation. Consequently, through the train of

gears 350 to 354, inclusive, the idler gears 355 and intermediate gears 356 and 356A, each of similar ratchet clutches 358 associated with the dials of the respective registers 325 and 326 are also locked against rotation. However, upon the occurrence of a tens-transfer into a higher order dial of either register 325 or 326, the associated tens-transfer gear 394 and 394A, respectively, becomes effective to impart an increment of movement to the dial in the normal direction of rotation thereof.

As explained above, each of the dials in each register 325 and 326 is resiliently retained in each differentially rotated position thereof by means of similar detent levers 380 and 380A, respectively. Normally, the nose 379 of each detent lever 380 is urged by the associated torsion spring 382 into engagement between the teeth of the corresponding gear 378 integral with the associated dial 329 and dial 330 (FIGS. 6 and 7) and, upon counter-clockwise rotation of a dial, the nose 379 ratchets over the teeth of the gear 378. In passing over each tooth, the nose 384 of the arm 383 of lever 380 is rocked clockwise into a recess 450 provided in the periphery of the hub 395 of the single-tooth transfer gear 394. Immediately following a tens-transfer into a higher order dial, the peripheral surface of the hub 395 of the active single-tooth tens-transfer actuator 394 moves beneath the nose 384 of the detent lever 380 associated with the adjacent lower order dial to retain the nose 379 of the lever 380 in a tooth space of the gear 378, thereby precluding further rotation of the dial. The lower order dial thereafter remains locked against rotation until near the end of the cycle of operation. Each hub 395 is of sufficient width to enable its movement into blocking position relative to the nose 384 of the corresponding detent lever 380 in either the inactive, or the active, position of the associated single-tooth tens-transfer actuator 394. The radial shoulders 451 and 452, formed by the recess 450 in each hub 395, are spaced equiangularly in each of the hubs 395 associated, respectively, with the first and second order dials from the right, as viewed in FIG. 20. However, the spacing between the radial shoulders 451 and 452 is equiangularly greater in each of the hubs 395 associated with each succeeding higher order, in accordance with the equally greater angular displacement of the tooth of the transfer actuator 394 of each higher order from the tooth of the actuator 394 of the adjacent lower order, i.e., approximately 30°. It is to be noted that in the full-cycle position of the parts, the shoulders 451 on each of the hubs 395 are aligned across the register in the position of the shoulder 451 shown in FIGS. 6 and 7. As rotation is imparted to shaft 396 during the tens-transfer phase of an operation, the peripheral surface 454 of the hub 395 associated with each order moves into a position underlying the nose 384 of the corresponding detent lever 380 to block the dial against further rotation, immediately following an increment of rotation imparted thereto by the tens-transfer actuator 394 carried by the hub 395 associated with the adjacent lower order dial. Although there is never a tens-transfer into the ½¢, or lowest, order of the register 325 (FIG. 20), a detent lever 380 is provided which becomes effective, almost immediately after initiation of the tens-transfer phase of the operation, to block the lowest order dial 330 against further rotation under the control of the hub 395 associated with that order. If, however, the dial 330 passes from its "0" indicating position to the "½" position, the hub 395 associated with the lowest order and the tens-transfer actuator 394 carried thereby, is moved laterally to the left (FIG. 20) to effect a tens-transfer in the adjacent higher order, or second order, dial, which takes place almost immediately after initiation of the tens-transfer phase of the operation. The peripheral surface 454 of the hub 395 associated with the second order dial becomes effective, immediately after the tens-transfer into this dial, to lock it against further rotation simultaneously with the locking of the dial 330. Following an increment transfer into the highest order dial from the adjacent lower order dial, an auxiliary hub 403 (FIGS. 20 and 25) becomes effective to lock the associated detent lever 380 in engagement with the teeth of the gear 378 on the highest order dial.

As explained hereinbefore, the descending, or subtracting, register 325 is manually adjusted by a post office official to represent the amount of prepaid postage purchased. In the five-bank meter illustrated and described, the purchaser may purchase postage in the amount of $100.00 to $900.00 in one-hundred dollar denominations or in the amount of $1,000.00 to $9,000.00 in one-thousand dollar denominations, as desired. The amount of postage purchased is represented by a manual adjustment of either the next to the highest order dial 329 of the register 325 (FIG. 2) or the highest order dial 329 of the register.

The sight opening 339 for each of the two highest order dials 329 of the register 325 is broadened to extend beyond the right side of the corresponding dial, as viewed from the right in FIG. 2, and this broader portion is extended downwardly to provide an elongated opening 453 which serves to expose the tens-transfer teeth 392 on the right-hand surface of the dials. Except in the case of a malfunction of the mechanism, as will be described hereinafter, each meter operation is terminated in the full-cycle position of the parts, wherein, it will be recalled, the ratchet clutches 358 are locked against rotation. Therefore, in order to selectively adjust either of the two highest order dials 329, a post office official may insert a suitable instrument, such as a stylus, into the right end of the corresponding elongated aperture 453 (FIG. 2) and between the teeth 392 of the associated dial 329. Upon movement of the instrument to the left (FIG. 2) the selected dial is turned in a counter-clockwise direction, as viewed in FIG. 6, independently of the associated ratchet clutch 358, to indicate the desired amount of postage purchased. For example, if the postage purchased is in the amount of $200.00, the penultimate dial 329, i.e., the second dial from the bottom in FIG. 2, will be rotated until a "2" appears in the sight opening 339 in the register supporting plate 26. Similarly, if the desired postage is in the amount of $2000.00, the highest order dial will be rotated until a "2" appears in the sight opening 339 associated therewith.

During each cycle of meter operation, the desired amount of postage, as indicated in the selector register 145, is imprinted on a piece of mail matter and the value is subtracted from the value in the descending register 325. The same value, or amount of postage indicated in the selector register 145 is also accumulated in the ascending register 326 with each cycle of operation. As each desired amount of postage is subtracted from the balance indicated in the register 325, the balance continues to be reduced until zeros appear in each of the sight openings 339 associated with the two highest order dials 329. Assuming a hypothetical condition wherein the purchase of postage in the amount of $1,000.00 has been made and the highest order dial 329 has been adjusted to register "1," each successive cycle of meter operation will reduce this value in accordance with selected values indicated in register 145. After the highest order dial 329 has returned to "0" registration, the balance remaining in the register 325 will continue to be reduced until the second highest order dial 329 is also reduced to "0" registration. The balance now indicated in the register will be $99.99½ or less. Thereafter, upon the registration of "0" in each of the two highest order dials 329 of the register 325, further operation of the meter is precluded.

A notch 458 is provided in the periphery of the web portion 360 of each of the two highest order dials 329 and corresponds to a tooth spacing of the gear 378 formed integrally therewith (FIGS. 6 and 23). In the "0" regis-

tering position of each of the two highest order dials the notches 458 are engaged by the V-shaped free end of each of similar U-shaped arms 460 (FIG. 6) secured in ordinal spaced relation on shaft 311 which extends transversely of the register 325 parallel with dial shaft 331. If a value other than "0" is registered in either of the two highest order dials 329, the V-shaped nose of the corresponding arm 460 rides on the peripheral surface 461 of the web portion 360 of the dial, as shown in phantom line in FIG. 6, thereby retaining shaft 311 in its clockwise rocked position. In the clockwise rocked position of the shaft 311 (FIG. 6), or counter-clockwise position (FIG. 17), the arm 310 secured on the outer end of the shaft is retained in the inactive position indicated by phantom line in FIG. 17, wherein the hook 312 of the arm 310 is held out of engagement with the laterally extended ear of the arm 308 secured on shaft 298, as explained hereinbefore. In the inactive position of the arm 310, indicated by phantom line in FIG. 17, the arm 308 and therefore shaft 298 are free to rock under the control of the cam 288 (FIG. 18) with each cycle of meter operation. However, after each of the two highest order dials 329 is moved to the "0" registering position, the arm 310 and shaft 311 are rocked clockwise in FIG. 17 under the influence of spring 309 to rock arms 460 to the active position shown in FIG. 6. Upon clockwise rocking movement of arm 310 (FIG. 17) the hook 312 is moved into engagement with the laterally extended ear of the arm 308 to positively retain the nose 313 of the arm 296 in the notch in cam 288 (FIG. 18), thereby preventing rotation of gear 287. As explained supra and to be more fully described hereinafter under the heading "Main Drive Mechanism," locking gear 287 against rotation prevents movement of the bail 193 from its active position with respect to indicia print head 160 and also serves to prevent rotation of drive shaft 265. Further operation of the meter unit is thereby precluded and should an inadvertent attempt be made to operate the device, a slip clutch or overload device becomes effective to notify the operator of the condition of the meter unit. In order to again render the device operative, the portable meter unit must be taken to the post office where an authorized official readjusts either of the two highest order dials 329 of the register 325 in accordance with the amount of prepaid postage purchased. Upon adjustment of either of these dials 329, the arm 310 is moved to its inactive position and rotation may again be imparted to gear 287.

Several precautions have been taken whereby fraudulent use of the meter is prevented. A lever 464 (FIGS. 2 and 3) is pivotally mounted intermediate its ends on a stud 465 secured on frame plate member 24. Adjacent its one end, lever 464 carries a roller 466, normally maintained in engagement with the outer surface of the timing belt 324 under the urgency of a spring 467. Spring 467 is secured at its one end in an aperture in one arm of the lever 464 and, at its other end, on a pin carried on frame plate member 24. The spring 467, through roller 466, normally serves to keep the belt 324 taut. However, should the belt 324 be severed, a hook 468 formed at the upper end of the lever 464 is rocked counter-clockwise under the urgency of spring 467 into engagement with one or the other of similar laterally extended pins 469, 470 secured on the outer surface of toothed pulley 322. It will be noted that the postage indicia printing head 160 and the toothed pulleys 322 and 323 rotate in a counter-clockwise direction, as viewed in FIGS. 3 and 5, and it will also be noted that the printing die 205 of the indicia printing head 160 moves into printing position in an opening 471 provided therefor in base 21, immediately following the digitation phase of the cycle of meter operation, i.e., approximately 210° in the cycle. It is to be pointed out that the opening 471, provided in the base 21 of the meter casing, is of a length sufficient only to permit rotation of the print head 160 therein and is of a width approximately two-thirds of the arcual length of the indicia die 205, so that only a portion of the die 205 appears in the opening 471 at any given time.

When the belt 324 breaks during an operation, the digitation phase of the cycle may or may not have been completed, depending upon the position of the pin 470 relative to the hook 468. If the belt 324 becomes severed at any time after the initiation of a cycle of operation and before the pin 470 reaches the full-cycle position indicated by the position of the pin 469 (FIG. 3), the hook 468 of the lever 464 engages the pin 470, thereby preventing further rotation of the toothed pulley 322. Thus, the indicia die 205 will not be moved into the opening 471 so that an impression will not have been taken. Inasmuch as the indicia printing head 160 is locked in an intermediate cyclic position, the amount of postage indicated in the selector register 145 is locked in the selection mechanism by virtue of the fact that the knife edge 304 of the arm 303 is engaged in the notches 305 formed in the bottom edge of the die adjusting slides. Also, under this condition the tens-transfer phase of the cycle will not be initiated. In the event the belt 324 breaks during any part of the cycle after the pin 470 has passed the position of the pin 469, as seen in FIG. 3, the driving shaft 265, indicia printing head 160 and the toothed pulley 322 will continue in a counter-clockwise direction until pin 469 engages the hook 468 of the lever 464, terminating the rotation of the shaft 265 in the full-cycle position thereof. Under this condition, the postage impression will have been made and the digitation phase of the cycle will have been completed so that the amount of postage registered in the dials 146 of the selector register 145 will have been subtracted out of the descending register 325 and accumulated in the ascending register 326. However, the tens-transfer phase of the operation may, or may not, have been completed.

Following a severance of the belt 324, the cover 46 of the meter must be removed by someone having the authority to do so and the broken belt 324 replaced by a new belt. In the first instance and after the cover 46 has been removed, the indicia printing head 160 is moved counter-clockwise (FIG. 5) to its full-cycle position and the actuator shaft 58 and, therefore, actuators 56 and 57 are likewise rotated in a counter-clockwise direction, as viewed in FIG. 6, to their full-cycle position followed by the replacement with a new belt 324. It will be remembered that under the first condition described, the amount of postage indicated in the register 145 remains locked in selection. Consequently, as the actuators 56 and 57 are rotated to their full-cycle position, the amount of postage indicated in register 145 will be entered into the descending register 325 and the ascending register 326 followed by the tens-transfer phase in each register to complete the operation. In the second instance, even though the indicia printing head 160 is restored to its full-cycle position wherein it becomes locked, and the selection slides are free to be adjustably moved by the wheels 108 of the selector mechanism, the digitation phase of the cycle of operation will have been completed and the value in the register 145 will have been entered into the registers 325 and 326. However, the actuaors 56 and 57 must be restored counter-clockwise, as viewed in FIG. 6, to their full-cycle position before installment of the new belt 324. During the restoration of the actuators 56 and 57 to their full-cycle position, the tens-transfer phase of the operation will be completed.

The only access to the mechanism of the meter unit is by the removal of the cover 46, which completely encloses the meter unit and is secured on the meter frame by means of two similar flat head machine screws 475 which are threaded into respective tapped holes in the horizontal leg 476 of the angle bracket 112 (FIGS.

6, 26 and 27). A pair of similar apertures 477 is provided in the register cover 113 concentric, respectively, with the tapped holes in bracket 112 and of a diameter sufficiently larger than the heads of the screws 475 to permit the removal thereof.

A plate 478 substantially rectangular in shape is slidably and removably mounted for endwise movement within a slot formed by a channel 479 in the lower surface of the register cover 113. In the normally inserted position of the plate 478, the slotted head of each of the screws 475 is concealed so that the screws cannot be removed. To remove the meter cover 46, an authorized person has but to slide the plate outwardly to a position wherein the inner end of the plate 478 is moved beyond the head of the left-hand screw 475 (FIG. 27) and an indenture 480 in one edge of the plate 478 coincides with the aperture 477 in cover 113 provided for the removal of the right-hand screw 475.

In order that the dials of the register may be read with the plate 478 in its normally inserted position, a rectangular aperture 481 is provided in the plate 478 and corresponds to the aperture 345 in the meter cover 46. The transparent thermoplastic window 338 is sufficiently large to extend beyond the confines of the aperture 481 in the plate 478 and is preferably molded on the plate to become an integral part thereof. The parallel edges of an elongated opening 482 in the register cover 113 are undercut to form a guide-way for the window 338. The parallel defining edges of the window 338 are beveled to conform with the undercut edges of the opening 482 (FIG. 6) and the frictional contact of the chamfered surfaces of the beveled edges of the window 338 and those of the undercut edges of the opening 482 serve to provide a seal against dust and dirt. The same opaque decorative material used for the register cover 113 is utilized to form an extension 483 of the window 338 and is molded, or otherwise secured, on the plate 478 for movement therewith. The edge surfaces of the extension 483 are contoured to agree with those of the window 338 and the rounding border edge of the cover 113, thereby completing the symmetrical lines of the meter.

In order to adjust the descending register 325 to indicate the amount of prepaid postage purchased, authorized personnel of the post office have but to remove the plate 478 and, therefore, window 338 from the meter. The plate 478 is normally locked in its inserted position by means of a key lock and lead seal, the key to the lock being held by a post office official. The cylinder 488 (FIGS. 28 and 29) of a key lock, generally indicated at 489, is provided with a key slot and is rockably secured within a cylindrical member 490 having a threaded male end portion for receiving a nut 491. The threaded end portion of the cylindrical member 490 is inserted in an aperture in a spacer yoke 492 and also through an aperture of similar size in the meter cover 46. On the end opposite the threaded end, the cylindrical member 490 is provided with a flange 493 which serves to limit the extent the member 490 may be inserted. The cylindrical member 490, cylinder 488 and the yoke 492 are secured in place on the meter cover 46 by the application of the nut 491. A tongue 494 is secured on the inner end of the cylinder 488 and, upon rocking thereof by a key in the slot in the cylinder 488 to the vertical position indicated by a phantom line in FIG. 28, the arcuate end of the tongue 494 enters into each of two matched slots 495 and 496 in the plate 478 and meter cover 46, respectively. Thus, the plate 478 and window 338 are locked in their inserted position, thereby preventing access to the screws 475 or the descending register 325.

Following the replacement of the plate 478 and window 338 in the meter unit, a key slot cover 497 is moved into place and sealed. The outer end 498 of the plate 478 is exposed and curvilinearly formed to provide a surface which may be grasped to remove the plate. An ear 499 is formed upwardly and at a right angle to the plate 478 adjacent the exposed end thereof and has an aperture 500 therein positioned on the vertical center line of the cylinder 488 (FIG. 29). The key slot cover 497 is pivotally mounted at its lower end on a headed pin 501 which is secured on the lower extended end of the yoke 492 and is axially centered on the vertical center line of the cylinder 488. At its upper end, the cover 497 has an aperture 502 therein, which, in the vertical position of the cover 497, is aligned with the aperture 500 in the ear 499. The wire of the leaded seal is then passed through the apertures 500 and 502 by a post office official and access to the key slot in the cylinder 488 is thereafter prohibited. A compression spring 503 on the pin 501 serves to resiliently retain the cover 497 in contact with the head of the pin 501 and also tends to retain the cover in any position to which it may be rocked.

It is to be explained that in order to lift the cover 46 from the framework of the meter after the removal of the screws 475, the handle 47 must first be detached by removing each of the screws 52 (FIGS. 7, 8 and 9), pivotally securing the handle on the respective brackets 48 and 50.

In order to operate, the meter unit 20 must be secured in operating position upon the top surface of the cover 12 of the base portion 10. Upon securing the meter unit in its operating position on the base portion 10, the gears 269 and 287 must be maintained in proper alignment for meshing engagement with respective gears 270 and 295 (FIG. 33). Cam disk 274 must likewise be aligned for cooperation with the Geneva wheel 272. To assure proper alignment of these members, a guide shoe 508 is secured to the lower surface of the meter unit base 21 by any suitable means, such as a plurality of similar screws 509, and is maintained in spaced relationship to the base 21 by means of a rectangular plate 510 (FIGS. 10, 17, 31 and 32). The width of the rectangular plate 510 is substantially equal to the distance between the parallel surfaces of opposed ears 511, projecting inwardly from the parallel edges of a rectangular opening 512 of a plate 513. The ears 511 are identical in contour and project an equal extent into the opening 512. Plate 513 is secured by any suitable means, such as a plurality of flat-head screws 514, on a support member 515 in parallelism with the top surface of the cover 12. The support member 515 is secured in a similar manner on the cover 12 by a plurality of screws (not shown) similar to screws 514. The width of the guide shoe 508 is only slightly less than the width of the opening 512 in the plate 513, providing flanges 516 of equal width on each side of the rectangular plate 510. Similar openings 517 are provided in each of the flanges 516 and conform to the contour of the corresponding projections 511 of the plate 513. The length of the openings 517 is slightly greater than the lengthwise dimension of the corresponding projections 511 and, in the removable position of the meter unit 20, coincide therewith. The opening 512 extends downwardly (FIGS. 30 and 32) at a reduced width equivalent to the distance between the parallel surfaces of the opposed projections 511 and the extended portion is of a length sufficient to provide clearance for the lower end of the rectangular plate 510 in the operating position of the meter unit 20. Correspondingly, the guide shoe 508 is provided with an extension 518 (FIG. 32) of a reduced width the equivalent of that of the rectangular plate 510. The lower end of the extension 518 of guide shoe 508 abuts the end wall of an open end rectangular channel 519 formed in support member 515, thereby limiting the extent of movement of the meter unit 20 as it is secured in active position on the base portion 10, as seen in FIG. 32. The lengthwise defining walls of the channel 519 are parallel and the channel is of a width equal to that of the rectangular opening 512. The depth of the channel 519 approximates the thickness of the

guide shoe 508 and is sufficient to permit sliding movement of each of the flanges 516 beneath the corresponding projections 511 when the meter unit 20 is moved into active position.

In order to actively position and secure the meter unit 20 on the base portion 10, the openings 517 in the flanges 516 of the guide shoe 508 must first be aligned with the corresponding projections 511 on the plate 513, at which time the guide shoe 508 will drop into the confines of the channel 519 in support member 515. As the guide shoe 508 settles into position in the channel 519, an aperture 520 in the shoe 508 embraces a pin 521 which is secured on the left end of a link 522 (FIG. 30) and extends upwardly through an elongated slot 541 in the web section 540 of support member 515. At its other end, link 522 is pivotally mounted at 523 on the outer end of a distended arm 524 of a bellcrank 525. The bellcrank 525 is rockable about a shoulder screw 526 which extends through plate 513 and is secured in the cover 12. At its outer end, the other arm 527 of bellcrank 525 carries a lug 528 extended upwardly at a right angle thereto, providing a finger grip for controlling the rocking movement of the bellcrank 525 from an inactive to an active position or vice versa. Following a partial movement of bellcrank 525 from either of its two positions, a toggle spring 529 becomes effective to assist in the further movement thereof and to resiliently maintain bellcrank 525 in its active or inactive position, as shown by phantom line and full line, respectively, in FIG. 30. As bellcrank 525 is rocked counter-clockwise from the inactive position to the active position thereof indicated by phantom line in FIG. 30 and by full line in FIG. 32, the arm 527 is cammed upward slightly upon engagement with the convex end of a pin 530 carried by a bracket 531 secured on cover 12 by means of shoulder screw 526 and machine screw 532. Upon continued counter-clockwise movement of the bellcrank 525, the leading edge of the arm 527 abuts a pin 533 secured on bracket 531 and, simultaneously therewith, an aperture 534 in the arm 527 engages over the pin 530, thereby locking bellcrank 525 in its actively rocked position. Only a slight upward pressure is required to release the arm 527 from the pin 530 when it is desired to move the bellcrank 525 from its active to its inactive position.

A substantially V-shaped channel 538 is formed in the lower surface of the support member 515 having the walls thereof extending angularly inwardly from the open right end of the support member 515 (FIG. 30) toward a point of convergence to provide freedom of movement for the link 522 upon rocking movement of bellcrank 525. In order to enable movement of the bellcrank 525, a substantially V-shaped indenture 539 is formed in the rightmost end of the support member 515 (FIG. 30) including a portion of the web section 540 between channels 519 and 538.

After the guide shoe 508 on the meter unit 20 is positioned within the channel 519 and the aperture 520 is in engagement with the pin 521 on link 522, the bellcrank 525 is moved to its active position, thereby moving the meter unit into operating position wherein the extension 518 of the shoe 508 abuts the end wall of the channel 519, as seen in FIG. 32. To assure a straight line movement of the meter unit 20, the pin 521 is guided in the slot 541 which extends longitudinally of the support member 515 intermediate the walls of the channel 519 and parallel therewith. As the meter unit 20 is moved downwardly to its operating position (FIG. 32), the lower portion of the lower section of each flange 516 extending beyond the rectangular plate 510 moves beneath respective shoulders formed by the narrower extended portion of the aperture 512 in plate 513. Similarly, the lower portion of the upper section of each flange 516 also moves to the position shown beneath the corresponding ears 511, thereby locking the meter in place. The meter unit 20 is adequately supported for movement into, or out of, its operating position by means of a lip, or ridge, 542 extending along the left edge of the support member 515 (FIG. 31) and by the upwardly offset extension of a flange 543 secured along the rightmost edge of the support member 515. The offset of the flange 543 is contoured to conform with the outer radius of the juncture of the lip 22 with the bottom portion of the meter unit base 21 and serves as an additional guide for the meter unit as it is moved into operating position.

Main Drive Mechanism

In the normally covered condition of the meter unit 20, only two portions of the mechanism enclosed therein are exposed, one being the inking roller 546 (FIGS. 2, 5, 12 and 17) projecting through an aperture in the cover 46 and to be described hereinafter under the heading "Inking Mechanism," and the other being the gear 269, cam disk 274 and gear 287, which also project through a suitable aperture in the cover 46. Even though the gears 269 and 287 may be manually rotated, following the removal of the meter unit 20 from the base portion 10, and an impression might possibly be taken from the indicia printing head 160, the amount of postage indicated in the selector register 145 will be subtracted from the descending register 325 and will be accumulated in the ascending register 326, as explained above. Thus under such a condition, fraudulent use of the meter is precluded. If the two highest order dials 329 of the descending register 325 were returned to "0" prior to the removal of the meter unit 20 from the base portion 10, the latching arm 310 (FIG. 17) will have been moved to the active position shown and the gear 287 will be locked against rotation. The gear 287, it will be remembered, serves upon rotation thereof to rock the bail 193 to its inactive position to enable the rotation of the indicia printing head 160.

As the meter unit 20 is moved into active position under control of the bellcrank 525 (FIG. 30), the gears 269 and 287 on the driving shaft 265 of the meter unit 20 will be positioned for meshing engagement with respective gears 270 and 295, as viewed in FIGS. 33 and 36. However, should the gear 270, Geneva wheel 272 and gear 295 be in the normal full-cycle position thereof, as seen in FIG. 33, and if for some reason the cam disk 274 and/or gear 287 should be out of the full-cycle position, installation of the meter unit 20 cannot be made. Mutilated gear 270, Geneva wheel 272 and gear 295 are keyed and secured on an arbor 549 carried by a hub 550 secured on a shaft 551 journalled at its ends, respectively, in similar bearings in the vertically extended ears 552 and 553 of a bracket 554, which is secured on an extension of the supporting member 515 (FIGS. 36 and 39). A mutilated gear 558, similar to mutilated gear 270, and a Geneva wheel 559, similar to Geneva wheel 272, are likewise keyed on the arbor 549 coaxial with gear 270, Geneva wheel 272 and gear 295. The gear 558 cooperates with a gear 560 secured on a shaft 561 (FIG. 36) journalled intermediate its ends in a bearing on a vertical upright extension 562 of bracket 554 and at its rearward end in a bearing secured on an upright extension 563 of the bracket 554. The shaft 561 is locked against lateral movement by means of similar spring clips 564 which are snapped into position in corresponding annular grooves in the shaft 561 on either side of the bearing bushing secured on the upwardly extended portion 563 of the bracket 554. Upon meshing engagement with the gear 560, the mutilated gear 558 serves to impart a counterclockwise rotation to the shaft 561 (FIG. 37) and an auxiliary, or town circle, printing head, generally indicated at 565 (FIG. 36), secured on the forward end thereof. The printing head, or drum, 565 rotates in synchronism with the postage indicia printing head 160 in the meter unit 20. A cam disk 566 is secured on gear 560 for rotation therewith and is provided with an arcual indentation having the same radius as the arcuate projection 567 of Geneva wheel 559 with which it cooperates

to prevent rotation of the auxiliary printing head 565 in the full-cycle position thereof.

Referring to FIGS. 36, 39 and 42, an antibacklash spring 570 is mounted on the extended end of shaft 551, having its inner end secured by any suitable means, such as a screw 571, on the upwardly extended ear 553 of the bracket 554. The spring 570 is tightly coiled and its inside diameter is substantially that of the outside diameter of the shaft 551 so that shaft 551 may be driven in a clockwise direction, as viewed from the left in FIG. 42, but becomes locked against rotation in the opposite, or counter-clockwise, direction. Shaft 551 is driven unidirectionally through a cyclically operable clutch, generally indicated at 572, to control the cyclic rotation of shaft 265, indicia printing head 160 and actuator shaft 58 in the meter unit 20. Clutch 572 also serves to control a cyclic rotation of shaft 561 and the auxiliary printing head 565 which is driven in synchronism with the indicia printing head 160.

It will be recalled that upon rotation of shaft 551, the gear 295 becomes effective through the cooperating gear 287 to impart rotation to the sleeve 286 and cam 285 about shaft 265, thereby releasing the bail 193 from its active engagement with the indicia printing head 160. Simultaneously therewith, the cam 288 driven with gear 287 also becomes effective to lock the amount of postage indicated in the register 145 in the selection mechanism. During this initial phase of each cycle of operation, the arcuate portion 273 of the Geneva wheel 272 (FIG. 33) positively blocks rotation of shaft 265, and the arcuate portion 567 of the Geneva wheel 559 (FIG. 37) also functions in a similar manner to prevent rotation of shaft 561. Immediately following the movement of the arcuate portion of each of Geneva wheels 272 and 559 out of engagement with the arcual indenture in the corresponding disks 274 and 566, the teeth of the mutilated gears 270 and 558 become enmeshed with the teeth of the respective gears 269 and 560 to impart a full cycle of rotation to the respective shafts 265 and 561.

The cyclically operable clutch 572 is adapted to impart rotation to shaft 551 by means of a three-armed spider 575 which is keyed on the hub 550 secured on shaft 551 (FIGS. 39, 40 and 41). The spider 575 is mounted within the area encompassed by a circular flange 576 of a cup-shaped driving disk 577, the web portion of which is secured on a toothed pulley 578 rotatably mounted on shaft 551. A bottomed aperture 579 is formed in the leading face of each of the arms of the spider 575, each of the apertures being adapted to receive a pin 580 normally urged outwardly by a compression spring 581. In order to provide a driving connection between the driving disk 577 and the driven spider 575, a roller holding plate 582 is freely mounted for rocking movement in an annular groove formed in the hub 550 between the spider 575 and the shoulder 583 of the hub. A disk 584 is secured on plate 582 on the outer surface thereof by means of similar pins 585 for rocking movement therewith. The pins 585 are equiangularly spaced on a common radius and each pin is extended inwardly to support one of similar cylindrical rollers 586. The bore of each of the rollers 586 is larger than the diameter of the extension of the corresponding pin 585 to enable a radial displacement of the roller relative to its supporting pin upon engagement of the clutch. In the normally inactive full-cycle position of the shaft 551, a shoulder 587 formed in the periphery of the roller holder plate 582 is in engagement with a tooth 588 formed on one arm 589 of a bellcrank 590 pivotally mounted at 591 (FIGS. 36, 40 and 42) on an upwardly extended leg 592 of a substantially U-shaped auxiliary bracket 593. The bracket 593 is secured to the web portion of the bracket 554 which, in turn, is secured on the supporting member 515, as explained above. The other leg 594 of the U-shaped bracket 593 serves as a support for the counter control and centralizer mechanisms, as will be hereinafter described (FIG. 33). A spring 595 is secured at its respective ends in an aperture in the horizontal arm of bellcrank 590 and in an aperture in a clutch control link 596 and normally serves to urge the tooth 588 of the bellcrank 590 into engagement with the shoulder 587 in the periphery of the roller holder plate 582 in the full-cycle position thereof, as seen in FIG. 40.

In the full-cycle position of the roller holder plate 582, as seen in FIG. 40, the rollers 586 urge the corresponding pins 580 inwardly of the apertures 579, compressing the associated springs 581. In this position of the rollers 586, the driving disk 577 may revolve freely on shaft 551. If, as seen in FIG. 41, the tooth 588 of the bellcrank 590 is rocked clockwise out of engagement with the shoulder 587 on the roller holder plate 582, the compression springs 581 urge the associated pins 580 outwardly to move the corresponding rollers 586 up the inclined surface 597 and into frictional contact with the inner surface of the flange 576 on the driving member 577. Thereafter, the rollers 586 become wedged between the corresponding inclined surfaces 597 and the inner surface of the flange 576, thereby coupling the driving member 577 with the spider 575 to impart rotation to shaft 551. The outside diameter of the disk 584 (FIG. 39) is greater than that of the roller holder plate 582, providing a flange which serves to retain the tooth 588 of the bellcrank 590 in the rotational plane of the shoulder 587 on the plate 582.

To engage the clutch 572, the clutch control link 596 is moved to the right, as viewed in FIGS. 40 and 41, by a mechanism to be hereinafter described. A shoulder 598 is formed in the lower edge of the link 596 adjacent the free end thereof and is normally in engagement with a laterally extended ear 599 on the upper end of arm 589 of bellcrank 590, so that, as link 596 is moved to the right, bellcrank 590 is rocked clockwise, removing the tooth 588 from the shoulder 587. To assure a single-cycle operation of clutch 572, one of the pins 585 is extended outwardly, as at 605 (FIGS. 36 and 42), and becomes effective midway in the cycle to engage the rounded end portion of the link 596, thereby lifting the shoulder 598 from its engagement with the lateral extension 599 of bellcrank 590. Spring 595 becomes effective immediately thereafter to urge the bellcrank 590 counter-clockwise, as viewed in FIG. 40, to position the tooth 588 for engagement with the shoulder 587 in the full-cycle position of the roller holding plate 582, thereby disengaging the clutch 572.

As explained hereinbefore, the shaft 265, which carries the indicia printing head 160, is centralized in the full-cycle position thereof by the engagement of the roller 282 (FIGS. 13 and 15) in the notch in cam disk 284 secured on the shaft 265 and in the notch of the cam 285 secured on the sleeve 286. The shaft 561 carrying the auxiliary printing head 565 is also centralized in the full-cycle position thereof in a manner similar to that of the shaft 265. A roller 606 (FIGS. 33 and 36) is carried on the lower end of one arm of a bellcrank 607 pivotally mounted at 608 on the upwardly extended leg 594 of the U-shaped bracket 593. A disk 610 is secured on shaft 561 and is provided with a notch in the periphery thereof which, in the full-cycle position of the shaft, is adapted for engagement by the roller 606 under the urgency of a relatively strong spring 609.

During operation of the postage metering device, the cup-shaped disk 577 of the clutch 572 revolves continuously under control of motor driven mechanism within the base portion 10. Structually, the base portion 10 of the postage metering device comprises the cover 12 (FIGS. 1, 32, 42 and 43), base plate 616, a pair of crossframe members 618 and 619 and supporting frame members 620, 621 and 622. The supporting frame members 620, 621 and 622 extend longitudinally of the base portion 10 and are secured at their respective ends, in spaced parallel relationship, on the crossframe members 618

and 619 which are secured to the inner surface of the front and rear walls of the cover 12. An auxiliary frame member 623 (FIGS. 42 and 43) is secured on, and maintained in parallel relationship to, the supporting frame member 621 by any suitable means, such as screws 624 and spacers 625. Each of the supporting frame members 620, 621 and 622 and the auxiliary frame member 623 are secured on the base 616 by means of similar hold-down bolts 626 and provide support for the operational control mechanism of the postage metering device.

An electric motor 615 (FIG. 43) is secured on the base plate 616 of the base portion 10 and serves as the only source of power to impart continuous unidirectional rotation to the driving disk 577 of the cyclic clutch 572. The operation of the motor 615 is selectively controlled by the manipulation of an ON-OFF switch 617 extending through a suitable aperture in the cover 12 (FIG. 1). In order to transmit power from the motor 615 to the clutch 572, a worm 630 is pinned on a stub shaft 631 (FIGS. 42, 44 and 48) journalled in laterally extended ears 632 and 633 of a bracket 634 which is mounted adjacent auxiliary frame member 623 and is secured thereon by means of the screws 624. The worm 630 is enmeshed wtih a worm gear 635 secured on main drive shaft 636 and is driven by motor 615 through a coupling 637. Shaft 636 is journalled at its ends in suitable bearings, such as bushing 944, in supporting frame members 620 and 622. Intermediate its ends the shaft 636 is also journalled in a similar bushing 944 in frame member 621 and a bushing in the auxiliary frame member 623 and the adjacently mounted bracket 634.

Upon rotation of shaft 636, power is transmitted to the cyclically operable clutch 572 through an overload clutch, generally indicated at 644, and a timing belt 642 (FIGS. 32, 42 and 43). The timing belt 642 passes over the toothed pulley 578 through an opening provided in the web portion of the bracket 554, the supporting member 515 and the cover 12 and is driven by a similar toothed pulley 643 on shaft 636. The worm gear 635 (FIG. 47) is rotatably mounted on shaft 636 and is spaced from bracket 634 on adjacent frame member 623 by a collar 645 secured on the shaft. A disk 646 of overload clutch 644 and a spacer collar 647, interposed between, and coaxial with, disk 646 and gear 635, are secured on the gear 635 by any suitable means, such as rivets 648.

Therefore, upon energization of the motor 615, the gear 635, spacer 647 and disk 646 will be driven continuously, normally imparting continuous synchronous rotation to the driving disk 577 of the clutch 572. However, if an undue load is imposed on the postage metering device, the overload clutch 644 becomes effective to prevent damage to hte motor or the driven mechanism.

The toothed pulley 643 is mounted for axial sliding movement upon a collar 649 (FIGS. 46 and 47) secured on shaft 636 concentric therewith. The collar 649 carries diametrically opposed keys 650 which are engaged in corresponding diametrically opposed keyways 651 in pulley 643. The axial length of the collar 649 is less than the width of the pulley 643 to permit limited axial sliding movement of the pulley thereon. To limit the sliding movement of the pulley 643 on the collar 649, a disk 652 is secured on the pulley 643 by the engagement of apertures in the disk with axially parallel projections 653 on the left-hand surface of the pulley (FIG. 47) for rotation therewith. Similarly, axially parallel projections 654 on the right-hand surface of the pulley 643 (FIG. 47) are engaged in corresponding apertures in a disk 655. Adjacent its right-hand end, the shaft 636 (FIG. 47) is provided with parallel flatted surfaces 656 and a mutilated threaded portion adapted to receive a nut 657. The bore of the disk 652 is concentric with that of the pulley 643 and collar 649, while the concentric opening in the disk 655 conforms to the flatted end of the shaft 636 for sliding movement thereon. To effect a driving connection between worm gear 635 and pulley 643, a ball retainer disk 662 is interposed between, and is contiguous with, the adjacent surfaces of the disks 646 and 652. At least three equiangularly spaced apertures are provided on a common radius in the disk 662 and are adapted to receive balls 663. At least six similar equiangularly spaced apertures 664 are provided in each of the disks 646 and 652. Each of the apertures 664 is smaller in diameter than the apertures in the disk 662 and have a radial disposition equal to that of the apertures in the disk 662. A countersink is provided for each of the apertures 664 in the surface of the disks 646 and 652 adjacent the respective surfaces of the disk 662. The countersunk apertures provide a nest for the balls 663 which are of a diameter greater than the thickness of the retainer disk 662. The balls 663 are normally resiliently retained in the countersink of the corresponding apertures 664 in each of the disks 646 and 652 by means of a triangularly-shaped spring member 665. The triangularly-shaped member 665 comprises three laminations of a resilient material, preferably spring steel, the equally spaced arms of which are formed inwardly to bear against the disk 655. A washer 666 is mounted on shaft 636 in a manner such that it bears against the spring member 665 and, upon application of nut 657 on the mutilated threaded portion of the shaft 636, serves to adjustably maintain a desired degree of pressure on the disk 655 and pulley 643. Thus, the pulley 643 is resiliently maintained in driving engagement with the worm gear 635.

There are certain conditions under which the postage meter unit 20 may become locked against further operation. One such condition occurs when the two highest orders of the descending register 325 are returned to "0" and the hook 312 of the arm 310 (FIG. 17) is moved into engagement with the laterally extended ear of the arm 308. Another condition occurs, upon the severance of the timing belt 324 (FIG. 3), when the hook 468 engages with either pin 469 or 470 on toothed pulley 322. Under either of these conditions, the shaft 636 will become locked against rotation so that upon energization of, or during the operation of, motor 615, the gear 635 and disk 646 will continue to be driven, forcing the balls 663 out of their nested position. Thereupon, the balls 663 become effective to move the toothed pulley 643 to the right, as viewed in FIG. 47, against the urgency of the spring member 665, thereby breaking the driving connection between disc 646 and the disk 652 on the toothed pllley 643.

Auxiliary Print Head

As stated supra, the auxiliary print head 565 revolves cyclically in synchronism with the postage indicia print head 160 and is secured on the outer, or forwardly, extended end of shaft 561 beyond the vertical extension 562 of bracket 554 (FIG. 42). A town circle die 670 (FIGS. 36 and 49) is carried by the auxiliary print head 565 and becomes effective to cause an impression of the city and state to be made on mail matter with each cyclic rotation of the head. The auxiliary print head 565 also carries date dies, generally indicated at 671, a "Bulk Rate" die 672 and a slogan die 673, each of which dies may be selectively controlled to cause impressions thereof on mail matter passed through the postage metering device. In addition to the dies 670, 671, 672 and 673, the print head 565 comprises circular end frames 674 and 675 of similar diameter (FIGS. 36, 42, 49, 50, 55 and 58) maintained in parallel spaced-apart relation by a substantially U-shaped frame 676. Each end of each leg 677 and 678 of the U-shaped frame 676 is provided with similar projections (not shown) adapted for engagement in corresopnding rectangular slots 679 in each of the circular disks, or end frames, 674 and 675, as seen in FIG. 67. The legs 677 and 678 are thereby maintained in parallel planes and are equidistantly spaced from the axis of the shaft 561. The end frames 674 and

675 are keyed on the flatted portion of the shaft 561 (FIGS. 51 and 55) and, with the interposed frame 676, are secured in the position shown by means of a hexagonal nut 681, wherein the outer face of the end frame 674 abuts a shoulder 680 on the shaft.

The town circle die 670 is curved to conform with the outer arcuate surface of the web portion 685 of U-shaped frame 676 and is secured thereon by any suitable means, such as screws 686, in a position such that the printing surface of the die 670 extends beyond the periphery of the end frames 674 and 675. The "Bulk Rate" die block 672 is secured on the upper end of a radially disposed extension 687 (FIGS. 50 and 51) of a bar 688 mounted for endwise movement on the outer surface of the leg 677 of U-shaped frame 676 by the engagement of aligned elongated slots 689 with pins 690 on the leg 677. In the upper, or print, position of the "Bulk Rate" die 672, as seen in FIGS. 50 and 51, the printing surface of the die is in the same rotational plane as that of the town circle die 670. For some classifications of mail matter it is necessary that the "Bulk Rate" die 672 be lowered from the print position shown to the nonprint position. In order to control the movement of the "Bulk Rate" die from its print to its nonprint position, the bar 688 is provided with a camming slot 691 which is in engagement with a pin 692 on a laterally disposed slide 693 mounted for endwise sliding movement at a right angle to the bar 688. Slide 693 is guided in its endwise movement by the engagement of an open end slot 694 and an aligned slot 695 with respective pins 696 secured on leg 677 of U-shaped frame 676. A spring 697 is secured at its one end on an extension of the lower pin 690 and, at its other end, is secured in an aperture in a laterally extended ear 698 of a depending portion of the slide 693 and normally serves to urge slide 693 to the right, as viewed in FIG. 50, thereby retaining the "Bulk Rate" die 672 in its nonprint position. The control of the movement of the slide 693 will be described hereinafter.

The slogan die plate 673 is curved to conform with the arcuate surface of a segmental die block 700 and is removably secured thereon (FIGS. 49, 51 and 58). To retain the die plate 673 in position on block 700, a clamp 701 (FIGS. 52, 54 and 58) is secured within a notch at one end of the die block 700 and is provided with an arcuately formed lip 702 overlying one edge portion of the die plate 673. The clamp 701 is located midway of the arcual length of the slogan die plate 673 and is of sufficient width to maintain perfect alignment of the plate 673 with the town circle die 670 and "Bulk Rate" die 672. Intermediate the ends of the die plate 673, a square notch 703 is formed in the curvilinear edge of the plate 673, opposite clamp 701, and is adapted to receive the upper end portion of an inverted T-shaped leaf spring 704 (FIGS. 52, 53 and 58). Opposed lateral projections at the extremity of the upwardly extended leaf of spring 704 overlie the outer surface of the die plate 673, thereby securing the plate in position on the die block 700. The spring 704 is held in the position shown by a similar T-shaped bracket 705, the bar portion of which is secured at its ends on the inner surface of a recess or notch formed in the die block 700. The upwardly offset extension 706 of the bracket 705 serves to permit a limited resilient movement of the spring 704, to the position indicated by phantom line in FIG. 52, which is sufficient to release the die plate 673 for removal thereof.

The die block 700 is adjustably secured on the leg 678 of the U-shaped frame 676 for lateral movement from the nonprint position, shown in phantom line in FIG. 51, into the printing position shown in full line, wherein the printing surface of the die plate 673 lies in the same rotational plane as the printing surface of the town circle die 670 and the "Bulk Rate" die 672 in the printing position thereof. A counterbored aperture 710, in the outer surface of the die block 700, is centrally located relative to the defining edges of the block and is of a diameter sufficient to receive the head of a radially disposed pin 711. The shank of the pin 711 passes through an aperture of smaller diameter in the bottom of the counterbored aperture 710 concentric therewith and is secured at its end on leg 678 of U-shaped frame 676. The die block 700 and die plate 673 are normally urged to the position indicated by phantom line in FIG. 51 by means of a compression spring 712, bearing at its one end on the bottom of the counterbored aperture 710 and at its other end against the underside of the head of the pin 711.

The movement of the die block 700 and, therefore, die plate 673 from its normal nonprint position to the print position, as seen in full line in FIG. 51, is under the control of a channeled slide 713 (FIGS. 49, 51 and 58), which also serves to maintain the chordal surface of the segmental block 700 in a parallel plane with that of the surface of the leg 678 of U-shaped bracket 676. Each of similar parallel flanges 714 of channelled slide 713 is equidistantly spaced from the pin 711 and is adapted for engagement in the corresponding one of a pair of laterally disposed parallel slots 716 in the chordal surface of the segmental die block 700. A pair of substantially V-shaped teeth 717 (FIGS. 49 and 52) are formed in similarly spaced relation within each slot 716 and the edges of each tooth 717 are inclined outwardly toward a point of convergence and terminate in a flat surface parallel with the chordal surface of the die block 700. At its left end, each of the flanges 714 (FIG. 49) is notched to form an inclination 718 and a similar inclination 718 is formed at the right end of an indentation 715 provided in each flange 714 intermediate the ends thereof. The length of each inclination 718 and the angularity thereof is identical to that of the right edge of the corresponding teeth 717 and cooperate therewith to cam the die plate 673 outwardly to the printing position upon movement of the slide 713 to the position shown in FIG. 49. The channelled slide 713 is normally urged to the right (FIG. 49) by a spring 719 secured at its one end on a shaft 720 which is supported at its ends, respectively, in legs 677 and 678 of the U-shaped frame member 676. At its other end, spring 719 is supported on a stud 721 (FIGS. 49 and 51) which is secured to the web portion 722 of the slide 713 and extends through an elongated slot (not shown) in the leg 678 of frame 676. The shank of the pin 711, supporting the die block 700, extends through an elongated slot 723 (FIG. 58) in the web portion 722 of the slide 713 and serves jointly with the engagement of the stud 721 in the elongated slot in the leg 678 to guide the channelled slide 713 in its endwise movement. As the slide 713 is moved to the right (FIG. 49), the compression spring 712 (FIG. 51) urges the slogan die plate 673 to its non-print position wherein the bottom surface of each of the slots 716 bears against the upper edge of the corresponding flanges 714 and the inclinations 718 are in contact with the inclined right edge of the corresponding teeth 717 formed within the slot 716. The engagement of the flanges 714 (FIG. 58) in the corresponding slots 716 serve also, by the retention of the right end of the die block 700 in contiguity with the inner surface of the end frame 674, to assure arcuate rotational alignment of the slogan die plate 673.

The dater die unit 671 comprises a month type wheel 728, a day tens numeral type wheel 729, a day units numeral type wheel 730 and a year numeral type wheel 731 (FIGS. 49 and 56). The months of the year are embossed on the peripheral surface of the month type wheel 728 in equiangularly spaced relation, the numerals "1" to "3" are embossed on the day tens type wheel 729, the numerals "1" to "0" are embossed on the day units type wheel 730 and, in the embodiment shown, the numerals "58" to "69" are embossed on the peripheral surface of the year type wheel 731. The numerals on each of the wheels 729 to 731, inclusive, are angularly spaced on

the peripheral surfaces thereof in accordance with the angular spacing of the months on the type wheel 728. Each of the type wheels 728 to 731, inclusive, carries a twelve-tooth gear 737 and the wheels are adjacently mounted for rotation on a shaft 732 secured at its ends in the parallel arms 733 and 734, respectively, of a yoke, or carriage, 735 (FIGS. 56 and 57). The type wheels 728 to 731, inclusive, may be selectively adjusted for the printing of the desired month, day and year and are thereafter resiliently maintained in their adjusted position.

For this purpose, each of the twelve-tooth gears 737, except the gear 737 carried by the year type wheel 731, meshes with a corresponding twenty-tooth gear 746 (FIGS. 55, 56 and 57) rotatably mounted on a shaft 736 which is parallel with shaft 732 and is secured at its respective ends in legs 677 and 678 of the U-shaped frame member 676. A portion of each of the gears 746 extends into a suitable aperture 747 within the end frame 674 of the auxiliary print head 565 for control by a selectively settable mechanism which is effective to adjust the type wheels 728 to 730, inclusive, as will be described hereinafter under the heading "Dater Die Selection Mechanism." Inasmuch as the year type wheel 731 is adjusted but once a year, the adjustment thereof is accomplished by the use of a stylus. Following the selective adjustment of each of the date type wheels 728 to 731, inclusive, the V-shaped nose 740 on the upwardly extended arm of each pawl of a series of pawls 738 engages between adjacent teeth of the corresponding gear 737. The detent pawls 738 are rockably mounted on a shaft 739 secured at its ends in the arms 733 and 734, respectively, of the carriage 735 and each pawl is urged by an associated spring 741 in a counter-clockwise direction (FIG. 55) to resiliently retain the corresponding gear 737 in its adjusted position.

The dater die wheels 671 may be selectively moved into, or out of, the printing position shown in FIGS. 55, 56 and 57 by an adjustment of the yoke 735. Each leg 733 and 734 of the yoke 735 lies adjacent the respective legs 678 and 677 of U-shaped member 676 and are rockably mounted, adjacent the open end of the yoke 735, on shaft 736. The cross-member 748 of the yoke 735 carries a pin 749, centrally located thereon and extending through a vertically disposed slot 750 in the end frame, or disk, 675 of the auxiliary print head 565, to control the movement of the dater dies 671 from the print to the nonprint position. The pin 749 on the yoke 735 is normally urged toward the upper end of the slot 750, as viewed in FIGS. 55 and 57, by means of a spring 751. At its one end, spring 751 is supported on the shaft 720 and at its other end is secured on a pin 752 (FIGS. 49, 51 and 55) carried on the lower end of a depending portion 753 of arm 734 of yoke 735. In the print position of the yoke, or carriage, 735 (FIGS. 49, 55 and 57), a portion of the type die wheels 728 to 731, inclusive, extends through a suitable rectangular aperture 754 in the web portion 685 of the U-shaped frame 676 and also extends into a mating rectangular aperture 755 centered within the town circle die 670, so that the printing surface of the exposed type characters on the selectively adjusted wheels is flush with the printing surface of the town circle die 670, as viewed in FIG. 51.

As explained above, the dated dies 671 and the "Bulk Rate" die 672 may be selectively moved into the print or nonprint position and for this purpose a knurled knob 760 is rotatably mounted on the outer extended end of the reduced diameter of the shaft 561. The knob 760 (FIGS. 49, 50, 55 and 59) is mounted on the extended end of the shaft 561 adjacent the outer surface of the end frame 675 of the auxiliary printing head 565 and is secured in place thereon by a washer 761 (FIG. 55) and a spring clip 762 engaged in an annular groove in the shaft 561. A counterbored opening 763 is provided in the end surface of the knurled knob 760 and is adapted to receive the inner end portion of a smaller knurled knob 764. The inner end surface of the knob 764 is counterbored to accommodate the washer 761 and spring clip 762 and the outer end surface is provided with a counterbored opening 765 which is adapted to receive a nut 766 having a screw driver slot therein. The knob 764 is freely mounted on the extended end of the shaft 561 and the inner end surface thereof is retained in contiguity with the bottom of the counterbore 763 by the application of the nut 766 on the threaded end portion of the shaft 561. As seen in FIGS. 36 and 42, a substantial portion of the knob 760 and the knob 764 extend beyond the outer surface of the cover 547 for selective control by an operator. Each of the knobs 760 and 764 may be independently rotated in either direction from one extreme position to the other extreme position, the knob 760 having four positions and the knob 764 having but two positions.

In the extreme counter-clockwise position of the knob 760, as viewed from the right in FIG. 55, the "Bulk Rate" die 672 is moved to its nonprint position and the dater dies 671 are moved to the print position. Upon clockwise rotation of the knob 760 to its second position, the "Bulk Rate" die 672 and dater dies 671 are both in the print position thereof. As the knob 760 is turned clockwise to its third position, the "Bulk Rate" die 672 remains in its print position while the dater dies 671 are rocked downwardly to the nonprint position. Upon rotation of the knob 760 to its extreme clockwise position, both the "Bulk Rate" die 672 and the dater dies 671 are in their nonprint position. To control the adjustment of the dater dies 671 into, or out of, the print position, the pin 749 on the carriage 735 extends through the radially disposed slot 750 in the end frame 675 and into a camming slot 770 formed in the inner surface of the knurled knob 760 (FIGS. 55 and 59). The camming slot 770 is comprised of two arcual end portions 771 and 772 joined together by an inclined, or angularly disposed, portion of the slot, the arcual portion 771 having a greater radius than that of the arcual portion 772. The arcual portions 771 and 772 are of an equal length such that, upon rotation of the knob 760 from one extreme position to the second position, the carriage 735 will remain in one adjusted position thereof. However, upon rotation of the knob 760 from the second to the third position, the carriage 735 will be adjusted to its other position and will remain there upon rotation of the knob from the third to the fourth, or other extreme, position thereof. The adjustment of the "Bulk Rate" die 672 is controlled simultaneously with that of the dater dies 671 and, for this purpose, a tongue-like projection 773 on the rightmost offset end of the slide 693 (FIGS. 49 and 50) extends parallel with slide 693 through a suitable rectangular aperture 774 in end frame 675 and into an arcuate slot 775 in the inner surface of the knob 760. The spring 697 normally urges slide 693 to the right to retain the round end of the tongue-like projection 773 in engagement with the contoured bottom of the arcuate slot 775, the configuration of which is shown in its developed form in FIG. 61. At its extremities, the slot 775 is of an equal depth, which is greater than the depth of the intermediate portion of the slot in which two spaced-apart indentations are formed to represent the second and third positions of the knob 760.

As stated above, in the extreme counter-clockwise position of the knob 760, as viewed from the right in FIG. 55 or from the left in FIG. 58, the dater dies 671 will be in the print position while the "Bulk Rate" die 672 will be in its nonprint position. In this position of the knurled knob 760, the pin 749 on the carriage 735 will be positioned in the extreme end of the arcual portion 771 of camming slot 770 (FIGS. 59 and 61), while the tongue 773 will be in the extreme position in slot 775, i.e., the leftmost and deeper depression therein. Upon one step of rotation in a clockwise direction of the knob 760, the dater dies 671 will remain in the first described position, while the "Bulk Rate" die 672 will be moved to

its print position, wherein the pin 749 on carriage 735 and the tongue 773 of the slide 693 will be in the relative positions indicated in FIGS. 59 and 61. The selective combinations of the print and nonprint positions of the dater dies 671 and "Bulk Rate" die 672 meet all U.S. Government requirements for the various classifications of mail matter.

The slogan die plate may be detached and replaced by a die plate representing any desired slogan and may also be selectively moved into its print or nonprint position. A round end projection 776 is carried by, and extends outwardly from, the left end of the web portion 722 of the channel slide 713 (FIGS. 58 and 60) through a suitable rectangular aperture 777 in the end frame 675 and through an arcuate clearance slot 778 (FIG. 59) in knurled knob 760 to engage in an arcuate slot 779 in the inner surface of the knurled knob 764. The rounded end of the projection 776 on the channel slide 722 is retained in engagement with the contoured bottom surface of the arcuate slot 779 by means of spring 719. In the extreme counter-clockwise position of the knob 764, as viewed from the left in FIG. 58, the nose of the projection 776 rests in a shallow depression in the slot 779 and the channel slide 713 is moved to the right in FIG. 58 or to the left to the position shown in FIG. 49 wherein the slogan die plate 673 is moved outwardly to its print position. Upon turning the knob 764 in a clockwise direction, as viewed from the left in FIG. 58, the spring 719 urges the channel slide 713 to the left, the extent of its movement determined by the deepest portion of the slot 779. Under this condition, the spring 712 urges the slogan die plate 673 inwardly to the nonprint position indicated by phantom line in FIG. 51.

Dater Die Selection Mechanism

The dater die selection mechanism is mounted as a unit 785 within the cover 547 (FIGS. 32, 33, 63, 64 and 66). The month type die wheel 728, the day tens type wheel 729 and the day units type wheel 730 of the dater dies 671 are selectively adjusted by a differential rotation of the respective selector wheels 786, 787 and 788. In the embodiment shown, each of the wheels 786, 787 and 788 is preferably molded of a thermoplastic material and has a hub and a twelve-tooth gear 789 integrally formed therewith. The wheels 786, 787 and 788 are rotatably mounted on a shaft 790 secured at its ends, by means of spring clips, in respective spaced-apart parallel frame members 791 and 792 formed upwardly at a right angle to a supporting plate 793. The dater die selection unit 785 is supported within the postage metering device by securing the plate 793 on an auxiliary base 794, which is supported on, and is secured to, the parallel vertical extensions 562 and 563 of the bracket 554 by any suitable means, such as a plurality of similar hold-down bolts 795 (FIGS. 33 and 42). Wheel 786 and the integrally formed gear 789 thereon is spaced from the adjacent frame member 791 by a collar 796. A similar collar 796 and a disk 797 are interposed between selector wheel 788 and the adjacent frame member 792. The selector wheel 787 is equally spaced from the adjacent wheels 786 and 788 by similar disks 797 on shaft 790. A portion of each of the wheels 786, 787 and 788 extends through a suitable aperture in the cover 547 and also through a corresponding aperture in a cover panel 798 which, in the embodiment shown, is of a decorative thermoplastic material molded or otherwise secured on the top surface of the cover 547.

The months of the year are engraved at equiangularly spaced intervals on the peripheral surface of the hub portion of wheel 786, while the numerals "1" to "3" are engraved on the peripheral surface of the hub portion of the wheel 787 and the numerals "1" to "0" are engraved upon the hub portion of the wheel 788. The angular spacing of the numerals on each of the wheels 787 and 788 is in accordance with the spacing of the months on the hub of the wheel 786. The top surface of the cover panel 798 is substantially tangential with the hub portions of the wheels 786, 787 and 788 and the shape of the aperture therein for each wheel conforms with that portion of the corresponding wheel and hub 786, 787 and 788, which extends above the upper surface of the cover 547 so that only the engraved character indicating the selected adjusted position of each of the wheels is visual.

Referring now to FIGS. 33, 63, 64 and 66, the twelve-tooth gears 789 integral with the wheels 786, 787 and 788 are meshed with the respective forty-eight-tooth gears 805, 806 and 807. The gear 805 is carried on a hub 808 pinned on a shaft 809 which is journalled at its respective ends in frame members 791 and 792. The forty-eight-tooth gear 806 is secured on one end of a sleeve 810 journaled on shaft 809, which sleeve 810 at its other end carries a six-tooth sector 811. The forty-eight-tooth gear 807, enmeshed with the twelve-tooth gear 789 on selector wheel 788, is secured on one end of a sleeve 812 rotatably mounted upon sleeve 810 between gear 806 and sector 811. A fourteen-tooth sector 813 is secured on a hub 814 which is pinned on shaft 809 between frame member 792 and sector 811. The forty-eight-tooth gear 807, the six-tooth sector 811 and the fourteen-tooth sector 813 are equally spaced in accordance with the spacing between the gears 746 enmeshed with the gears 737 of the dater die 671 (FIGS. 56 and 57). Gear 807, sector 811 and sector 813 mesh respectively with a corresponding one of three twenty-four-tooth gears 818, rotatably mounted on a shaft 819 secured at its respective ends in frame members 791 and 792. The gears 818 are equally spaced on the shaft 819 and are positioned between a pair of similar bellcranks 820 rockably mounted on shaft 819 between the ends of spacer sleeves 821 and 822. The gears 818 mesh with twelve-tooth gears 823 which, in turn, are meshed with similar twelve-tooth gears 824. The gears 823, driven by corresponding gears 818, are rotatably mounted upon a shaft 825, while the gears 824, driven by gears 823, are rotatable upon a shaft 826. The shafts 825 and 826 are in parallelism with each other and with shaft 819 and are secured at their respective ends in the similar depending arms 827 of bellcranks 820.

In the arrangement shown in FIGS. 63 and 66, each 30° angular rotation of the month selector wheel 786 imparts one increment of rotation to the corresponding twelve-tooth gear 824 through sector 813. Similarly, each 30° angular rotation of the day tens selector wheel 787 imparts an increment of rotation to the corresponding twelve-tooth gear 824 through sector 811 and, in a like manner, each 30° angular rotation of the day units selector wheel 788 imparts an increment of rotation to the corresponding gear 824 through the gear 807. As shown, gear 807 may be revolved through 360°, whereas rotation of the month selector wheel 786 is limited to twelve angular adjustments thereof and the day tens selector wheel 787 is limited to three angular adjustments. The extent of the adjustment of each of selector wheels 786 and 787 in either direction is determined by the engagement of one extremity or the other of an arcual slot 828 and 829, formed in respective sectors 811 and 813, with a pin 830 secured on frame member 792. Each of the selector wheels 786, 787 and 788 is resiliently retained in each angularly adjusted position thereof by means of detent pawls 835 (FIGS. 63, 64 and 65), rockably mounted upon a shaft 836, secured at its ends in respective frame members 791 and 792. The detent pawls 835 are spaced on shaft 836 for cooperation with the gears 805, 806 and 807 and each pawl is provided at its lower end with a V-shaped nose 837 which is resiliently urged by means of an associated spring 838 into engagement between adjacent teeth on the corresponding gear. Each spring 838 is secured at its lower end on the hook end of an arm of the associated detent

pawl 835 and is supported at its upper end on a shaft 839 secured at its ends in respective frame members 791 and 792.

It will be recalled that following each cycle of meter operation, the postage indicia print head 160 is in the full-cycle position shown in FIG. 5. Likewise, the auxiliary print head 565 is in the full-cycle position shown in FIGS. 36, 42 and 63, wherein the dater dies 671 are 180° out of printing position and the gears 746 are aligned with the corresponding gears 824 of the dater dies selection mechanism for meshing engagement therewith, if desired. In order to selectively adjust the type wheels 728, 729 and 730 of the dater die unit 671, the gears 824 are rocked from the inactive position shown in FIG. 63 to the active position shown in FIG. 64 wherein the gears 824 mesh with the corresponding gears 746. For this purpose, each of the substantially horizontally disposed arms 840 of the similar spaced-apart parallel bellcranks 820 is provided at its end with a bifurcation 841 engaged with a shaft 842, which is supported adjacent its ends in apertures in the lower portion of respective flanges 843 and 844 of a channelled slide 845 (FIGS. 63, 64 and 65). The slide 845 is mounted for endwise movement between frame members 791 and 792 to control the rocking movement of the parallel bellcranks 820, moving the gears 824 into, or out of, engagement with gears 746. The outer surface of each of the flanges 843 and 844 of the slide 845 lies adjacent the inner surface of the respective frame members 791 and 792. Each end of the shaft 842 is extended to engage in a vertically disposed elongated slot 846 in each frame member 791 and 792 and serves to guide the lower end of the slide 845 in its endwise movement. At its upper end, the slide 845 is also guided in its movement by the engagement of shaft 836 in each of similar elongated slots 847 in respective flanges 843 and 844 of the slide. Slide 845 and therefore gears 824 are normally urged to the inactive position shown in FIG. 63 by a spring 848 which is supported at its upper end on shaft 839 and at its lower end on a stud 849 secured on the web portion 850 of the slide 845. A button, or key top, 855 is secured on a vertical extension of the web 850 of slide 845 and extends upwardly through a suitable aperture in the cover 547 and a mating aperture in the cover panel 798. As seen in FIG. 64, upon depression of key 855, slide 845 is moved downwardly against the urgency of the spring 848, thereby rocking gears 824 into engagement with the corresponding gears 746 in the auxiliary print head 565.

Inasmuch as the auxiliary print head 565 is enclosed within the cover 547, an operator must rely on the indication shown by the adjustment of the selector wheels 786, 787 and 788 to determine the setting of the dater die wheels 728, 729 and 730, respectively. Therefore, means are provided which prevent adjustment of the selector wheels 786, 787 and 788 when the auxiliary print head 565 is out of its full-cycle position. In the normally inactive position of the slide 845, as seen in FIG. 63, the end of a lateral projection 856 on the lower end of each of the detent pawls 835 abuts the inner surface of the web portion 850 of the slide 845. The nose 837 of each of the pawls 835 is thereby locked between adjacent teeth of the corresponding gears 805, 806 and 807. However, a vertically disposed rectangular aperture 857 (FIG. 65) is provided for each pawl 835 in the web portion 850 of the slide 845 and is normally positioned above the lateral extension 856 of each pawl. Upon depression of key 855, the apertures 857 are moved downwardly into position to receive the lateral extension 856 of the pawls 835, thereby permitting the nose 837 of each pawl to ratchet over the teeth of the corresponding gear 805, 806 and 807 during the selective adjustment of the respective selector wheels 786, 787 and 788. Thus, it becomes apparent that an adjustment of a selected wheel, or wheels 786, 787 and 788 may be made only while the key 855 is held depressed to retain the slide 845 in its downward position.

If the key 855 and the slide 845 are locked against depression, the selector wheels 786, 787 and 788 cannot be adjusted and the bellcranks 820 cannot be rocked to enmesh the gears 824 with the gears 746. To assure correct alignment of the gears 746 for engagement by the corresponding gears 824, a pair of spaced parallel notches 859 are formed in the flange of a flanged collar 858 (FIGS. 36 and 42) secured on shaft 561. The notches 859 are disposed on chords equally spaced either side of the axis of the shaft 561 and the spacing between the notches is identical to the spacing between similar projections 860 on the lower end of each of the arms 827 of bellcranks 820. Accurate spacing between the arms 827 of the bellcranks 820 is maintained by means of a spacer stud 861 having a tapped hole in each end thereof adapted to receive each of similar screws 862 (FIG. 42). In the full-cycle position of the auxiliary print head 565 and upon clockwise rocking movement of the bellcranks 820 by depression of key 855 (FIG. 64), the projections 860 enter the aligned notches 859 in the flange of the collar 858. Upon engagement of the projections 860 in the corresponding notches 859, shaft 561 will become locked against rotation, thereby precluding an inadvertent attempt to initiate operation of the meter device. The width of each of the notches 859 in the flanged collar 858 is sufficient only to permit the entry of the corresponding projections 860 thereinto. Therefore, should the auxiliary print head 565 be displaced from its full-cycle position, the leading edges of the projections 860 will engage the flange of the collar 858, thereby preventing downward movement of the slide 845 and an adjustment of the selector wheels 786, 787 and 788. Hence, the date registered on the dater die wheels 671 will invariably be that indicated in the dater die selection mechanism 785.

As explained hereinbefore, inasmuch as the year type wheel 731 of the dater die unit 671 is adjusted but once a year, the meter unit 20 is removed and the print head 565 is revolved approximately 270° to position the dater die unit 671 in the opening provided in the cover 547 (FIG. 67), wherein the type wheel 731 may be adjusted by means of a stylus. The auxiliary print head 565 is thereafter returned to its full-cycle position and the meter unit 20 is replaced for use in the postage metering device.

Inking Mechanism

An inking mechanism, generally indicated at 870 (FIGS. 32, 42 and 67), is of conventional construction and comprises a base element 871 and an ink fount cover 872. The base element 871 is secured on the auxiliary base 794 by a plurality of similar screws 873 and is compartmented to form ink reservoirs 874 and 875. The cover 872 is secured in place on base 871 by means of a spring clip 876 pivotally mounted on the upper end of an upwardly extended pin 877 secured on the auxiliary base 794. Each reservoir 874 and 875 may be filled with fluid ink through the respective wells 878 and 879 formed in the base element 871 and opening into the corresponding reservoir.

A series of rollers, generally indicated at 880, supplies the ink for the postage indicia die 205 and the type wheel 200 and wheels 201 of the indicia print head 160. A similar series of rollers 881 serve to supply ink to the "Bulk Rate" die 672, the town circle die 670, dater dies 671, and the slogan die 673, all of which are carried by the auxiliary print head 565. A roller 885 of the series of rollers 880 is preferably made of aluminum, or steel, and is partially submerged in the fluid ink in reservoir 875. Roller 885 is rotatable on a shaft 886 supported, adjacent its ends, in each of similar spaced-apart parallel flanges 887 formed at a right angle to the web portion of a carriage 888. Each end of the shaft 886 extends beyond the flanges 887 and is journalled in a semicircular

notch in the upper edge of each of the parallel sides of the base element 871. A similar semicircular notch is provided in the lower edge of each of the parallel sides of the cover 872 and serves, upon installation of the cover 872 on the base element 871, to secure shaft 886 in place. The flanges 887 extend outwardly and downwardly through an opening in the end of the cover 872 and a corresponding relief in the upper edge of the end of the base element 871. Adjacent its end, each flange 887 supports the respective ends of a shaft 889 upon which a transfer roller 890 is rotatably mounted. A similar transfer roller 891 is secured on a shaft 892, each end of which is engaged in a corresponding slot in each of the respective flanges 887. Shafts 889 and 892 are disposed in parallelism with each other and with shaft 886.

Each of the rollers 890 and 891 is preferably covered with an absorbent material, such as felt, which serves to transfer ink from the roller 885 to the indicia print head 160, as will be described. The spacing between the peripheral surfaces of each of the rollers 890 and the ink supply roller 885 is less than the diameter of the transfer roller 891, so that the roller 891 is nested between, and in frictional contact with, the surfaces of the rollers 885 and 890. A doctor blade 893, substantially the length of the ink supply roller 885, is secured to the base element 871 and is maintained in contact with roller 885 and serves, upon counterclockwise rotation of the roller 885 (FIG. 67), to control the amount of ink carried on the surface of the roller.

In the inactive position of the roller 890, as seen in FIG. 67, the meter unit 20 may be removed from the base portion 10, as explained hereinbefore. Following the replacement of the meter unit 20 into the position indicated by phantom line in FIG. 67, roller 890 is rocked downwardly into engagement with the roller 546 (FIGS. 5 and 12). Roller 546 is carried on a shaft 894 removably journalled at its ends in respective spring clips 895 formed upwardly at a right angle to a bracket 896 which is carried by a supporting plate 897 secured at its ends on auxiliary frame plate 42 and intermediate frame plate 44. Roller 546 is provided with an absorbent felt covering, similarly to rollers 890 and 891, and projects downwardly through an aperture 898 in the plate 897 for rolling contact with the indicia die 205 and the type wheels 201, upon counterclockwise rotation of the indicia print head 160. Roller 546 also projects outwardly through a suitable aperture in the cover 46 for inking contact with roller 890. It is to be noted that the roller 546 must be removed from between spring clips 895 prior to the removal of the cover 46 from the meter unit 20.

The inking mechanism for the auxiliary print head 565 is similar to, and functions in the same manner as, the inking mechanism for the indicia print head 160. A felt covered inking roller 905 is secured on a shaft 906 journalled at its ends in each of similarly upwardly extended ears 907 of a resilient supporting bracket 908 secured on the auxiliary base 794. The axis of the roller 905 is below the base, or platform, 794 and the position of the roller is such that, upon counter-clockwise rotation of the auxiliary printing head 565 (FIG. 67), the "Bulk Rate" die 672, town circle die 670, dater dies 671 and the slogan die 673 come into rolling contact with the felt covered roller 905, prior to the movement of the respective type dies into printing position. Ink is supplied from the reservoir 874 to the roller 905 through the series of rollers 881 which are supported between spaced parallel flanges 909 formed downwardly at a right angle to the web portion of a carriage 910. Fluid ink is transferred from the ink supply roller 911 to a felt covered roller 912, thence to a felt covered transfer roller 913 which, in the active position of the roller 913, is in rolling contact with roller 905. A portion of the roller 905 extends through a suitable aperture in the platform 794 for engagement with roller 913 which is rockable upwardly and downwardly within an opening 914 in the base element 871.

Each of the series of rollers 880 and 881 may be selectively rocked into or out of an active position, as seen in FIG. 67, by the manipulation of respective knurled knobs 918 and 919. Each of the knurled knobs 918 and 919 is secured on respective stub shafts 920 and 921 extending downwardly through a corresponding aperture in the top portion of the cover plate 872 and are secured in place on the cover 872 by the application of clips 922 engaged in suitable notches in the respective shafts 920 and 921 (FIG. 42). Upon 90° rotation of either knob 918 or 919 in either direction from the position shown in FIG. 67, the roller carriage 888 will be rocked clockwise about shaft 886 to move roller 890 into frictional contact with ink roller 546, whereas roller carriage 910 will be rocked counter-clockwise to move roller 913 out of frictional contact with the ink roller 905. To this end, a diametrically disposed rib having parallel surfaces is provided on the lower end of each of the shafts 920 and 921 and is engaged within correspondingly similar square apertures 923 in the web portion of the respective roller carriages 888 and 910. The internal dimensions of the square aperture 923 is greater than the diameter of the respective shafts 920 and 921 and, in the active position of the roller carriage 910 (FIG. 67), the left edge of the aperture 923 lies adjacent the left-hand surface of the diametrical rib on the end of the shaft 921. Thus, it can be seen that upon 90° rotation of the knob 919 in either direction to the position of knob 918, as shown, the roller carriage 910 will be rocked to its inactive position as indicated by the position of the roller carriage 888.

Each of the knobs 918 and 919 is retained, in a similar manner, in either 90° rotated position thereof. For this purpose, a spring washer 924 is keyed, or otherwise secured, on shaft 920 adjacent the lower end of the knob 918, between the knob and the top surface of the ink fount cover 872. Spring washer 924 carries four equiangularly spaced radial arms 925, each of which arms is formed downwardly and is provided with an extruded node in the end portion thereof adapted for resilient engagement in a corresponding recess in the top surface of the cover 872, when the knob 918 is in each 90° position thereof. A spring washer 926, similar to washer 924, is secured on shaft 921 beneath knob 919 and functions in exactly the same manner as the washer 924 associated with knob 918. Each of the knobs 918 and 919 extends upwardly through suitable apertures 927 and 928, respectively (FIGS. 42 and 67), in a cover 929 which is hinged at 930 on cover 547. The hinged cover 929 provides an access to the ink fount 870 when it becomes necessary to replenish the ink supply therein or to service the fount for any reason whatsoever. A diametrical slot is formed in the top surface of each knob 918 and 919 and the direction of lineation of each slot indicates to an operator the active, or inactive, position of the respective roller carriage 888 and 910.

Feed Mechanism

The feed, or conveyor, belt 11 is carried at its ends on similar crowned pulleys 935 and 936 secured on respective shafts 937 and 938 (FIGS. 42, 43 and 67). Shaft 937 is supported adjacent its ends in flanges 939 and 940 of a channelled carrier 941, while shaft 938 is journalled at its ends in each of similar bearings 942. The parallel bottom surfaces of diametrically opposed chordal notches in each bearing 942, equally spaced from the axis of the bearing, are slidably engaged within horizontally disposed open end notches 943 in the right end of each of flanges 939 and 940 (FIG. 67).

It will be noted that the surface speed of the belt 11 is in timed relation to the synchronous cyclic rotation of the indicia print head 160 and the auxiliary print head 565. Feed belt 11 is driven from motor 615 through

worm 630, worm gear 635 and shaft 636, which, as explained above, is journalled intermediate its ends in bearing 944 in supporting frame member 621 and, adjacent its outer end, in a similar bearing 944 secured in supporting frame member 620. At its opposite end, shaft 636 is likewise journalled in a bearing secured on frame member 622. A gear 948 is secured on the outer end of shaft 636, adjacent supporting frame member 620, and is enmeshed with a similar gear 949 mounted for rotation upon a stub shaft which is secured on the horizontal arm of a bellcrank 951 and extends through an enlarged opening (not shown) in frame plate 620. Gear 949, in turn, is enmeshed with a similar gear 950 secured on the leftmost extended end of shaft 937 (FIG. 43), the extension of the shaft 937 also passing through an enlarged opening in frame member 620. The right end of the shaft 937 (FIG. 43) also extends into a similar enlarged opening in frame member 621, which openings in frame members 620 and 621 are provided to enable a rocking movement of the pulley 935 and the left end of the carrier 941 (FIG. 67), as will now be described.

At its left end, the channelled carrier 941 (FIG. 67) is supported by each of similar parallel spaced-apart bellcranks 951 integrally formed at right angles to either end of a cross-member 952. Such support is provided by the engagement of the bifurcated left end of each flange 939 and 940 of carrier 941 in corresponding annular slots in shaft 937, the shaft, in turn, being journalled adjacent its ends in bearings secured in the end of the horizontally disposed arms of each of the bellcranks 951, which are positioned adjacent the respective supporting frames 620 and 621 and are rockably mounted upon shaft 636. A pair of springs 953 are secured at their one end on a shaft 954, supported between supporting frames 620 and 621, and are secured at their other end in apertures in the cross-member 952 to normally urge the bellcrank levers 951 and shaft 937 in a clockwise direction, as viewed in FIG. 67. The rightmost end of the channelled carrier 941 and the shaft 938 (FIG. 67) are supported in a similar manner between a pair of identical spaced-apart parallel bellcrank levers 958 formed at a right angle to a cross-member 959. Each of bellcrank levers 958 is positioned adjacent respective supporting plates 620 and 621 and is rockably mounted on a shaft 960 journalled adjacent each end thereof in supporting plates 620 and 621, respectively. The angularly disposed arm of each of bellcrank levers 958 is provided at its end with an aperture 961 embracing the corresponding bearing bushings 942 which, as explained above, serve as journals for shaft 938 and are slidably supported within the horizontal slots 943 in the end of the respective flanges 939 and 940. A pair of relatively strong springs 962 are secured at their one end, in spaced relation, on a shaft 963 supported at its ends in respective supporting plates 620 and 621 and, at the other end thereof, each of the springs 962 is secured in a suitable aperture in the cross-member 959. Each of pulleys 935 and 936 and belt 11 carried thereby are normally urged upwardly by means of springs 953 and 962 through a suitable aperture 964 in the base cover 12, so that the belt 11 moves in a plane above and parallel with the top surface of the cover.

Pulley 935 is driven in a clockwise direction, as viewed in FIG. 67, moving the exposed portion of the belt 11 to the right. In order to maintain the exposed portion of the belt 11 in a parallel plane with the top of the cover 12, the springs 953 urge belt 11 into contact with a pressure roller 970 (FIGS. 36 and 67) rotatably mounted on the outwardly extended end of a shaft 971, which is mounted axially parallel to, and above, shaft 937. Shaft 971 is secured intermediate its ends and at its inner end in bushings mounted on respective vertical extensions 562 and 563 of bracket 554. In a similar manner, roller 936 is normally urged upwardly, under the influence of springs 962, to resiliently retain belt 11 in contact with a series of annular equally spaced ribs 972 on a pressure roller 973 (FIGS. 6, 7, 10 and 11) projecting below the surface of the bottom plate 21 of the meter unit 20. Pressure roller 973 is rotatably mounted on a shaft 974 secured at its ends in the end walls of a housing 975, which is secured to the bottom plate 21 of the meter unit 20. In the full-cycle position of the indicia print head 160 (FIGS. 5 and 12), a similar series of annular equally spaced ribs 976, formed on pressure roller 264, project beyond the peripheral edge of disks 214 and 215 of print head 160 and through the opening 471 in the bottom plate 21 for contact with feed belt 11. A pressure roller 978 (FIGS. 5 and 6), positioned intermediate roller 973 and the normal position of roller 264, also carries a series of annular equally spaced ribs 977 which project below the lower surface of the base 21 into contact with belt 11. Roller 978 is rotatably mounted on a shaft 979 supported at its ends in the end walls of a housing 980 secured on base 21. The auxiliary print head 565 also carries a pressure roller 981 (FIGS. 51, 55 and 67) which is secured on a shaft 982 journalled at its ends, respectively, in end frames 674 and 675. The shaft 982 is mounted within the print head 565 so that a lengthwise portion of roller 981 projects beyond the periphery of the end frames 674 and 675 for contact with belt 11, in the full-cycle position of the auxiliary print head 565.

The support for the channelled carrier 941 is arranged in a manner such that the carrier 941 may pivot about shaft 937 or 938 or may be moved downwardly in a parallel horizontal plane. For example, upon the passage of mail matter of any thickness between roller 935 and pressure roller 970, the left end of the carrier 941 (FIG. 67) will be rocked downwardly about shaft 938. As the mail matter passes beneath pressure roller 978 and between pressure roller 973 and pulley 936, the pulley 935 may return to the normal position shown in FIG. 67. However, irrespective of the position of the pulley 935, the right end of the channelled carrier 941 will be rocked downwardly, pivoting about shaft 937. Upon removal of the meter unit 20 from the active position shown in phantom line in FIG. 67, the right end of the channelled carrier 941 will tend to move upwardly, but is restrained after very little movement by the engagement of the lower end of each of similar slots 985 in respective flanges 939 and 940 with shaft 960. A slot 986, similar to slot 985, is provided in each of flanges 939 and 940 to accommodate drive shaft 636, thereby permitting freedom of rocking movement of the carrier 941 about either shaft 937 or 938.

An impression roller 987 is provided for cooperation with indicia print head 160, and a similar impression roller 988 is provided for cooperation with auxiliary printing head 565. Impression roller 987 is secured on a shaft 989, which is journalled at its ends in one end of respective spaced-apart parallel flanges 990 and 991 formed at right angles to a web portion 992. Impression roller 988 is secured on a shaft 993 journalled at its ends in the opposite end of each of flanges 990 and 991. Shafts 989 and 993 are axially parallel and are spaced, one from the other, in accordance with the spacing between the axis of the shaft 265 of meter unit 20, in the secured active position thereof, and the axis of shaft 561. It will be remembered that shaft 265 carries the indicia print head 160, while shaft 561 carries auxiliary print head 565. Intermediate the ends thereof, each of flanges 990 and 991 is pivotally mounted, as at 995 (FIGS. 43 and 67), adjacent the end of, and between, similar spaced parallel arms 996 and 997, which are integrally connected by a cross-member 998 and are secured on shaft 960. Each end of shaft 960 is extended beyond respective supporting frame members 620 and 621 to provide a mounting for similar respective arms 1005 and 1006 (FIG. 43) which are pinned thereon. At its free end, each of arms 1005 and 1006 supports

one end of one of a pair of relatively strong springs **1007**. At their lower end, springs **1007** are secured on the respective extended ends of shaft **963**, as seen in FIG. 43 and in phantom line in FIG. 67, and serve through rollers **987** and **988** to maintain equal pressure between the belt **11** and the printing surface of the type dies on the corresponding print heads **160** and **565**.

Upon movement of the belt **11** to the right, as viewed in FIG. 67, the passage of mail matter beneath auxiliary printing head **565** and the postage indicia print head **160** will cause either roller **988** or **987** to be rocked downwardly independently of the other, or both rollers may be rocked downwardly simultaneously against the urgency of the relatively strong springs **1007**.

Proper tension for the true running of belt **11** is maintained by the adjustment of each of similar arms **1008** and **1009** which are mounted for endwise adjustment adjacent flanges **939** and **940**, respectively, of the carrier **941**. At its one end each of the arms **1008** and **1009** is provided with an aperture embracing the corresponding slidable bearing bushing **942** and, at its other end, each of the arms is adjustably secured on respective flanges **939** and **940** by means of eccentrically mounted shoulder nuts **1010** and **1011**. The nuts **1010** and **1011** are locked in an adjusted position by tightening an associated screw **994**.

The cyclic operation of the postage metering device shown and described is initiated upon the initial insertion of a piece of mail matter between belt **11** and pressure roller **970**. For this purpose, a pressure foot **1015** is secured at its one end on the outer extended end of a shaft **1016** which is journalled adjacent its outer end in the vertical extension **562** of the bracket **554** and at its inner end in the vertical extension **563** of the bracket **554**. An arm **1017** is secured on shaft **1016** (FIGS. 33 and 36), intermediate the vertical extensions **562** and **563**, and at its upper end is pivotally connected to the one end of clutch control link **596** (FIGS. 40 and 41). As explained hereinbefore, the shoulder **598** in the free end of the clutch control link **596** is normally engaged with the laterally formed ear **599** of clutch pawl **590**. Spring **595**, therefore, serves to urge clutch control link **596** to the left, as viewed in FIG. 40, thereby normally maintaining the free end of the pressure foot **1015** alongside, but not in contact with, belt **11**. Thus, it can be seen, that as the pressure foot **1015** is rocked counterclockwise, as viewed in FIG. 67, or clockwise as viewed in FIG. 41, engagement of the cyclically operable clutch **572** is effected. As each piece of mail matter is carried by belt **11** beneath the auxiliary print head **565** and the indicia print head **160**, a postmark similar to that shown in FIG. 38 will be impressed thereon, providing the dater dies **671**, the "Bulk Rate" die **672** and the slogan die **673** have been moved to their print position.

In the embodiment shown and described, a suitable digital counter **1020** is employed to register the number of pieces of mail matter which passes through the postage metering device. The counter **1020** is supported by a plate **1021** on four spacer studs **1022** secured on auxiliary base **794** in a position such that the sight opening **1023** of the counter is contiguous with the lower surface of the top of the cover **547** and may be viewed through a window in a suitable aperture **1024** in the cover panel **798** and a mating aperture in the top of the cover **547** (FIGS. 1, 32, 33, 34 and 35). In order to actuate the counter, the actuating shaft **1025** thereof carries a depending arm **1026** secured thereon for limited angular rocking movement. At its lower end, arm **1026** carries a pin **1027** engaged in a bifurcation **1028** in the end of one arm **1029** of a bellcrank **1030** pivotally mounted at **1031** on leg **594** of U-shaped bracket **593**. The arm **1029** extends upwardly through a suitable rectangular slot **1032** in the auxiliary base **794**, which slot serves to guide arm **1029** in its rocking movement about the pivot **1031**. To control the rocking movement of the bellcrank **1030**, the arm **1036** thereof is retained by a spring **1037** in engagement with the peripheral surface of a collar **1038** eccentrically mounted and secured on the cyclically driven shaft **561**. Thus, it becomes apparent that, upon each cyclic rotation of the driven shaft **561** for each operation of the metering device, bellcrank **1030** is rocked to-and-fro to effect an oscillation of the arm **1026** of counter **1020** to effect the registration therein.

I claim:

1. In a device of the character described, a descending register and an ascending register, ordinal dials in said descending register and said ascending register, certain of said dials in said descending register being manually preadjustable to represent a value, a tens-transfer mechanism for each of said registers, a selection mechanism including an indicating register, a manually operable setup means selectively settable to effect registration of a value in said indicating register, slide members differentially settable by said setup means in accordance with the value in said indicating register, a differential actuator means, a cyclically operable means for driving said actuator means, means adjustable by said slide members for differential operation by said actuator means and operable upon operation of said cyclically operable means to effect a subtractive registration in said descending register and an additive registration in said ascending register, means driven by said cyclically operable means operable to control operation of said tens-transfer mechanism subsequent to the operation of said actuator means, and means for initiating operation of said cyclically operable means.

2. In a device of the character described, a manually settable selection mechanism including ordinally arranged indicator dials, selectively operable means for setting a value in said indicator dials, a series of members differentially adjustable by said setting means in accordance with the value in said indicator dials, a cyclically operable differential actuating means, a first printing member and a second printing member, each of said printing members being cyclically rotatable in synchronism with said actuating means, adjustable printing devices in each of said printing members, the printing devices in said first printing member being adjustable by said adjustable members to effect the printing of the value in said indicator dials, means movable by said adjustable members relative to said actuating means for control thereby, a descending register and an ascending register, ordinally arranged dials in each of said registers, an ordinal transmission means driven by said movable means and operable to drive corresponding ordinal ones of said dials upon operation of said actuating means, a tens-transfer actuator means for each of said dials other than the lowest order dial in each register operable upon actuation thereof to impart an increment of rotation to the corresponding dial subsequent to the passage of an adjacent lower order dial in said descending register from "0" to "9" and passage of an adjacent lower order dial in said ascending register from "9" to "0," rotatable means operable to effect actuation of each of said tens-transfer actuators in each register, driven means operable in timed relation to the operation of said actuating means to effect operation of said rotatable means subsequent to the operation of said transmission means, a normally disengaged cyclic clutch, a source of power for said cyclic clutch, means driven by said cyclic clutch upon engagement thereof to effect rotation of said first and said second printing member and operation of said actuating means and said driven means, and tripping means for effecting engagement of said cyclic clutch.

3. In a device of the character described, a manually settable selection mechanism including ordinally arranged indicator dials, selectively operable wheels for causing a value to be registered in said indicator dials, a series of slide members differentially adjustable by said wheels in accordance with the value in said indicator dials, a cyclically operable differential actuating means, a series of gears, one for each of said slide members movable by said slide members relative to said actuating means for meshing

engagement therewith, a descending register and an ascending register, ordinally arranged dials in each of said registors, a uni-directionally operable clutch for each of said dials in each of said registers operable to control rotation of said dials in one direction, an ordinal transmission means driven by said series of gears and operable to drive corresponding ordinal ones of said uni-directional clutches upon operation of said actuating means, a single-tooth tens-transfer actuator for each of said dials other than the lowest order dial in each register normally inactively positioned relative to the corresponding dial and operable in the active position thereof to impart an increment of rotation in said one direction to the corresponding dial subsequent to the operation of said uni-directional clutches, means associated with each dial and rendered operable by a lower order dial during operation of the corresponding uni-directional clutch to move the one of said single-tooth tens-transfer actuators associated with the adjacent higher order dial into active position relative thereto upon passage of a lower order dial in said descending register from "0" to "9" and upon passage of a lower order dial in said ascending register from "9" to "0," rotatable means operable to effect operation seriatim of each actively positioned one of said tens-transfer actuators in each register, means for disabling the operation of said rotatable means, gear means operable in timed relation to the operation of said actuating means to effect operation of said disabling means and to render said disabling means inoperative subsequent to the operation of said transmission means, a first printing member and a second printing member, each of said printing members being cyclically rotatable in synchronism with said actuating means, said first printing member including adjustable numeral printing wheels and an indicia die encompassing the numeral type on said printing wheels in the printing position thereof, said second printing member including a series of date printing wheels and a town circle die surrounding the date type on said date printing wheels in the printing position thereof, a rack associated with each of said slide members differentially adjustable therewith and operable to adjust said numeral printing wheels in said first printing member in accordance with the value in said indicator dials, a normally disengaged cyclic clutch, a source of power for said cyclic clutch, means driven by said cyclic clutch upon engagement thereof operable to effect rotation of said first and said second printing member and operation of said actuating means, and tripping means for effecting engagement of said cyclic clutch.

4. In a device of the character described, a subtracting register and an adding register, a transmission means for invariably effecting the registration of a similar value in each of said registers simultaneously, a differential actuating means, a value selection mechanism including ordinally arranged wheels selectively settable to represent a value, a series of slide members, one for each of said wheels positionable by a corresponding wheel in a selected one of a plurality of positions, each of said slide members having a series of notches therein representative of the positions of the slide, a series of gears, one associated with each of said slide members adjustable thereby relative to said differential actuating means for engagement therewith and operable upon operation of said actuating means to drive said transmission means, a cyclically operable means for driving said actuating means, a normally inactive member rockable into engagement in a corresponding notch in each of said slide members for locking said slide members and said gears in the adjusted positions thereof, and means operated by said cyclically operable means for rocking said rockable member into active position.

5. In a device of the character described, a descending register and an ascending register, a first printing member including type wheels adjustable to represent a date and a town circle die surrounding said date type wheels, manually operable means for selectively adjusting said date type wheels, a second printing member including a plurality of ordinally adjustable numeral printing wheels and an adjacently mounted indicia die, a plurality of ordinal set-up wheels selectively settable to represent a value, one said set-up wheel for each of said numeral printing wheels, means differentially adjustable by said set-up wheels operable to adjust said numeral printing wheels, a cyclically operable drive means for causing simultaneous operation of said first and said second printing member, a differential actuator means driven by said drive means in synchronism with said printing members, and a transmission means adjustable relative to said actuator means and positionable by said adjustable means to connect said actuator means with each of said registers for controlling the registration of a value therein in accordance with the setting of said set-up wheels.

6. In a device of the character described in claim 5 having ordinally arranged dials in said descending register and in said ascending register, and a unidirectional clutch for each of said dials rendered operable by said transmission means upon operation of said actuator means to effect a registration in the corresponding ordinal dials of said registers.

7. In a device of the character described in claim 6 having a shaft in each register upon which said ordinally arranged dials and associated clutches are rotatably mounted, each of said dials being rotatable independently of the associated clutch, a locking means operable to prevent operation of said clutches in each register subsequent to the operation of said actuator means, a tens-transfer mechanism associated with each dial of each of said registers rendered operable by a lower order dial in said descending register and in said ascending register to effect an incremental rotation of the adjacent higher order dial of the corresponding register, and a tens-transfer actuating means operable during the operation of said locking means to cause operation of each of said tens-transfer mechanisms.

8. In a device of the character described, a selection mechanism including a plurality of ordinal members settable to represent a value, a cyclically operable drive means, a rotatable printing member driven by said cyclically operable drive means, a plurality of numeral type wheels, one for each of said ordinally settable members adjustably mounted in said printing member, a series of elements associated with said settable members and differentially adjustable thereby to control the adjustment of the corresponding ones of said type wheels, means rendered operable by said cyclically operable drive means to lock said series of elements in the differentially adjusted positions thereof, a register, a plurality of ordinally arranged dials in said register, a unidirectional clutch for each of said dials operable to impart rotation thereto, a differential actuator means driven by said cyclically operable drive means, means rendered operable by said series of elements for operation by said differential actuator means to control the operation of said clutches thereby effecting a registration of a value in said register in accordance with the adjustment of said type wheels, a normally inactively positioned tens-transfer actuating means associated with each of said dials other than the lowest order dial, means controlled by a lower order dial operable to move the said tens-transfer actuating means associated with the adjacent higher order dial to active position, means associated with said actuator means operable upon operation of said cyclically operable drive means to disable operation of said clutches subsequent to the operation of said actuator means, and means rendered operable by said cyclically operable drive means to drive said tens-transfer actuating means in timed relation to the operation of said differential actuator means and said associated means thereby effecting an incremental rotation of said dials independently of said clutches.

9. In a device of the character described, a selection mechanism including a plurality of ordinal members settable to represent a value, a cyclically operable drive

means, a rotatable printing member driven by said cyclically operable drive means, a plurality of numeral type wheels, one for each of said ordinally settable members adjustably mounted in said printing member, a series of elements associated with said settable members and differentially adjustable thereby to control the adjustment of the corresponding ones of said type wheels, a descending register including a plurality of ordinal dials, certain of said dials in said register being manually preadjustable to represent a value, a unidirectional clutch associated with each of said dials and operable to impart rotation thereto, said dials being rotatable independently of said clutches in the direction driven by said clutches, a differential actuator means driven by said cyclically operable drive means, clutch control means rendered operable by said series of elements for operation by said differential actuator means to control the operation of said clutches thereby subtracting the value in said selection mechanism from the value in said descending register, means operable in timed relation to the operation of said clutch control means by said actuator means to disable operation of said clutches, an ordinal tens-transfer actuating means operable upon passage of a lower order dial from "0" to "9" to effect an incremental rotation of the next higher order dial independently of the corresponding clutch, and locking means controlled by said certain of said dials to prevent subsequent operation of said cyclically operable drive means upon restoration of said certain dials to "0" registration.

10. In a postage metering machine having a selection mechanism including a plurality of ordinal members settable to represent a value, a cyclically operable drive means, a differential actuator means driven by said cyclically operable drive means, a descending register, a plurality of ordinal dials in said register, certain of said dials being manually preadjustable to represent a value, a unidirectional clutch associated with each of said dials operable to impart rotation thereto, said dials being rotatable independently of said clutches in the clutch driven direction of rotation, means differentially adjustable by said settable members for operation by said actuator means to enable operation of said clutches effecting a subtraction of the value in said selection mechanism from the value in said descending register, locking means associated with said actuator means operable to prevent operation of said differentially adjustable means and said clutches subsequent to the operation of said actuator means, and a tens-transfer mechanism for said register, the combination comprising a tens-transfer actuating means for each of said dials other than the lowest order dial normally inactively positioned relative thereto, a positioning means associated with each of said dials and rendered operable by a lower order dial to actively position the corresponding tens-transfer actuating means relative to the adjacent higher order dial upon passage of the lower order dial from "0" to "9," means for controlling the operation of each actively positioned one of said tens-transfer actuating means to impart an increment of rotation to the corresponding dial subsequent to the operation of said locking means, means for preventing operation of said controlling means, and means driven by said cyclically operable drive means effective to cause operation of said preventing means during the operation of said actuator means and to disable said preventing means and enable said controlling means subsequent to the operation of said actuator means.

11. In a postage metering machine of the type described in claim 10, said driven means including a mutilated gear means driven by said cyclically operable drive means effective to cause operation of said controlling means subsequent to the operation of said actuator means, and a cam means associated with said mutilated gear means operable in timed relation to the operation of said gear means to enable the operation of said preventing means during the operation of said actuator means and operable to disable said preventing means during operation of said controlling means.

12. In a postage metering device, a base member containing a cyclic clutch, a power source for said cyclic clutch, a first printing member supported on said base and including adjustable date type wheels, means selectively operable to adjust each of said date type wheels in said first printing member, a cyclically operable drive means driven by said cyclic clutch and operative to actuate said first printing member, and means driven by said cyclically operable means effective to disable operation of said selectively operable means during actuation of said first printing member; a meter detachably mounted on said base and containing a plurality of registers, a selection mechanism settable to represent a value, a differential actuator means for said registers, a second printing member mounted within said meter and including adjustable printing devices, means differentially positionable by said selection mechanism for operation by said actuator means to effect registration of a value in said registers, means controlled by the setting of said selection mechanism for adjusting said printing devices in said second printing member in accordance with the differential positioning of said positionable means, means for locking said printing devices in said second printing member in adjusted position, control means for actuating said second printing member and said actuator means and for enabling operation of said locking means, the said control means being operatively engaged with said cyclically operable drive means to thereby effect synchronous actuation of said first and said second printing member when the meter is operatively mounted on the base, and means for locking said meter in operative position on said base.

13. In a postage metering device, a base member comprising a main drive shaft, a series of gears on said shaft driven thereby, a normally disengaged cyclic clutch for controlling the operation of said drive shaft, a source of power for said clutch, a first printing member rotatable from a normally inactive position through a printing position, said first printing member including variably settable date type wheels surrounded by a town circle die, manipulative means selectively operable to set said date type wheels, means for disabling operation of said manipulative means, means driven by said source of power operable to take an impression from said date type wheels and said town circle die upon rotation of said first printing member, and gear means engaged with said series of gears operable to control rotation of said first printing member and operation of said disabling means; a meter detachably mounted on said base member in operative relation to said impression taking means and comprising a selectively settable selection means, a subtracting register, a total register, a second printing member including adjustable numeral type wheels surrounded by an indicia die and rotatable from a normally inactive position through a printing position relative to said impression taking means, means controlled by said selection means for adjusting said numeral type wheels and enabling a subtractive registration and an additive registration, respectively, in said subtractive register and said total register, a locking means normally inoperative to prevent adjustment of said numeral type wheels, a driven gear means associated with said second printing member and adapted for engagement with said series of gears for operation thereby to effect a synchronous rotation of said first and said second printing member when said meter is properly positioned on said base and to effect operation of said locking means, means for locking said meter in operative position on said base, and tripping means operable to engage said cyclic clutch.

14. In a postage metering device having a plurality of registers, a manually settable selection mechanism for setting up a value, a normally inactively positioned print-

ing drum, printing devices in said drum including a plurality of adjustable numeral type wheels and an indicia type, said printing drum being rotatable from the inactive position through a printing position, means operated by said selection mechanism for adjusting said numeral type wheels, a differential actuating means, means rendered operable by said adjusting means for control by said actuating means to effect registration of a value in said selection mechanism in said registers, a cyclically operable drive means for imparting rotation to said printing drum and effecting operation of said actuating means, a cyclic clutch for driving said cyclically operable drive means, and an auxiliary printing mechanism, the combination comprising a normally inoperative printing member rotatable through a printing position, means associated with said printing member and engaged with said cyclically operable drive means operative to effect rotation of said printing member in synchronism with said printing drum, a series of settable type wheels within a printing die mounted on said printing member for rotation therewith, ordinal elements manually adjustable to represent data to be printed by said settable type wheels, locking means for preventing adjustment of said ordinal elements, a manipulative means for disabling said locking means, normally inoperable means associated with said ordinal elements and rendered operable by said manipulative means to enable the setting of said settable type wheels in the normally inoperative position of said printing member, and means enabled by said associated means during operation of said cyclically operable drive means to prevent operation of said manipulative means.

15. In a postage metering device having a plurality of registers, a differential actuating means, a selection mechanism settable to represent a value, means adjustable by said selection mechanism for operation by said actuating means to control a registration of the value in said selection mechanism in said registers, and a printing mechanism, the combination comprising a rotatable printing drum including an indicia die mounted on the peripheral surface of said printing drum, said printing drum and indicia die having a normally inactive position, a plurality of adjustable numeral type wheels coaxially mounted side-by-side within said printing drum adjacent said indicia die and adapted to cooperate with said indicia die to form an impression surface from which a stamp impression having the value set in said selection mechanism may be taken, a series of gears mounted in said printing drum operable to impart adjustment to said numeral type wheels, resilient means for detenting each of said numeral type wheels in each adjusted position thereof, means for latching said detenting means in the operative position thereof to prevent adjustment of said numeral type wheels subsequent to the rotation of said printing drum from its normally inactive position, a rockable bail normally actively positioned relative to said printing drum and operable in the active position to disable said latching means, gear means carried by said bail and operable in the active position of said bail and the inactive position of said printing drum to connect said adjustable means with said series of gears thereby enabling adjustment of said numeral type wheels in accordance with the setting of said selection mechanism, locking means engageable by said gear means to prevent operation of said gear means and adjustment of said adjustable means upon movement of said bail to its inactive position, means for controlling the rocking movement of said bail, a cyclic clutch, means driven by said clutch upon engagement thereof operable to control the operation of said rocking means to rock said bail to its inactive position, mutilated gear means driven by said clutch and operable to impart rotation to said printing drum in timed relation to the rocking movement of said bail to inactive position, means for taking an impression from said indicia die and said numeral type wheels upon rotation of said printing drum, and means for causing engagement of said cyclic clutch.

16. In a postage metering device having a descending register, a plurality of ordinally arranged dials in said register, certain of said dials being manually adjustable to represent a value, a selection mechanism settable to represent a value, a differential actuator means, means rendered operable by said selection mechanism for control by said differential actuator means to effect a subtraction of the value represented in said selection mechanism from the value in said descending register, and a tens-transfer mechanism for said register the combination comprising, a normally inactively positioned tens-transfer actuator for each dial other than the lowest order dial, a rockable member associated with each tens-transfer actuator operable to control the positioning thereof, each of said rockable members having a tens-transfer setting position and an inoperative position, a retaining means for each of said rockable members resiliently operable to retain said rockable members in either the tens-transfer setting position or the inoperative position thereof, means mounted on each of said dials other than the highest order dial operative upon passage of a lower order dial from "0" to "9" to rock the corresponding one of said rockable members to the tens-transfer setting position thereby moving the associated tens-transfer actuator to active position relative to the adjacent higher order dial, means for driving said tens-transfer actuators operable to cause each actively positioned one of said tens-transfer actuators to impart an increment of movement to the corresponding dial subsequent to the operation of said differential actuator means, and a cam means mounted on each tens-transfer actuator operable upon operation of said driving means and in timed relation to the operation of the corresponding tens-transfer actuator to rock the associated rockable member to its inoperative position thereby restoring the tens-transfer actuator to its inactive position.

17. In a postage metering device, a base portion, a motor driven mechanism mounted in said base portion, a cyclically operable drive means, a cyclic clutch interposed between said motor driven mechanism and said cyclically operable drive means and operable upon engagement thereof to control the operation of said cyclically operable drive means, a first printing device having a full cycle position and mounted in said base portion for actuation by said cyclically operable drive means, a meter detachably mounted in an operative position on said base portion, means for locking said meter in operative position on said base portion and for unlocking it for removal therefrom, a second printing device having a full cycle position and mounted in said meter for actuation in synchronism with said first printing device, means for actuating said second printing device engageable with said cyclically operable drive means for control thereby upon operative positioning of said meter on said base portion and operation of said locking means, and means associated with said cyclically operable drive means operative to prevent engagement of said actuating means with said cyclically operable drive means and operation of said locking means when either said first or said second printing device is out of the full cycle position thereof.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,107,854 October 22, 1963

Ingemar H. Lundquist

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 17, line 52, for "FIG. 2" read -- FIG. 12 --; column 18, line 22, for "$9999.99½" read -- $99999.99½ --; column 25, line 1, for "of", first occurrence, read -- or --; line 12, for "in" read -- on --; column 28, line 40, for "penulitmate" read -- penultimate --; column 30, line 64, for "actuaors" read -- actuators --; column 36, line 68, for "Structually" read -- Structurally --; column 37, line 52, for "hte" read -- the --; column 38, line 71, for "corresopnding" read -- corresponding --; column 41, line 63, for "dated" read -- dater --.

(SEAL) Signed and sealed this 14th day of July 1964.

Attest:

ESTON G. JOHNSON
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