Aug. 25, 1936. J. W. OGDEN 2,052,485

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Fig. 1.

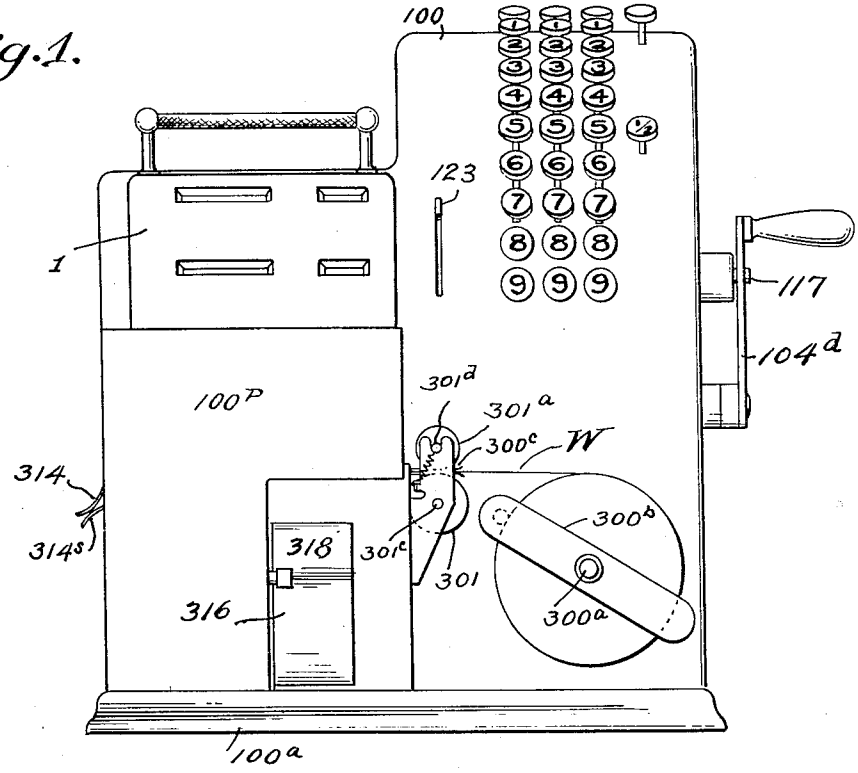


Fig. 2.

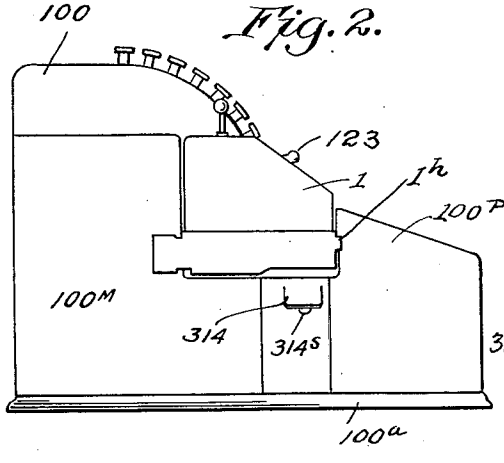
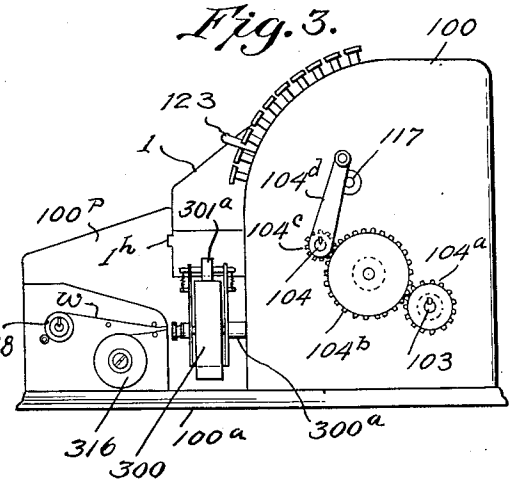


Fig. 3.



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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 5.

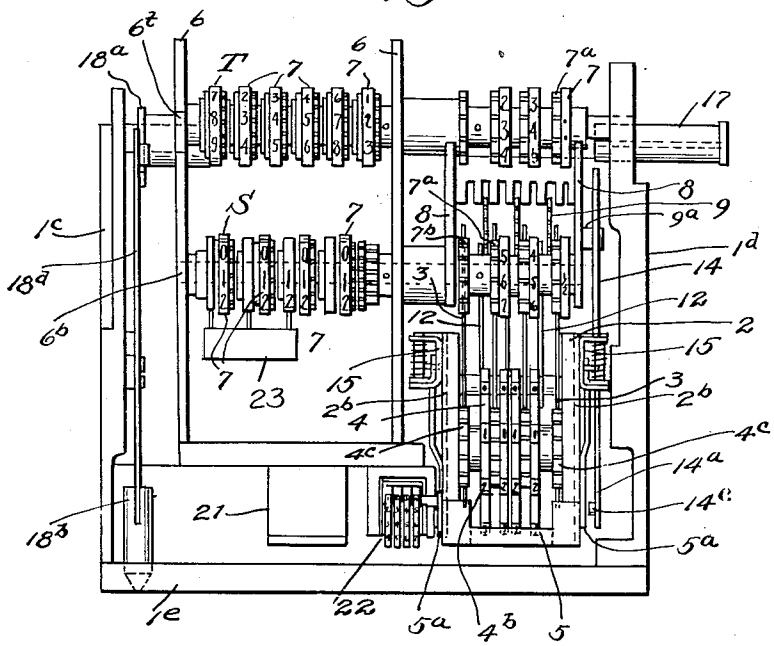
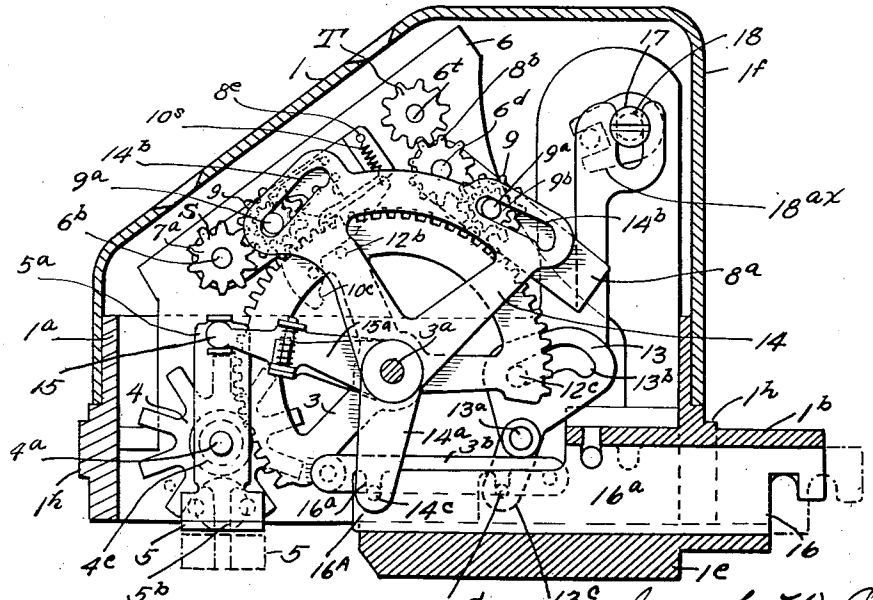


Fig. 4.



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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 6.

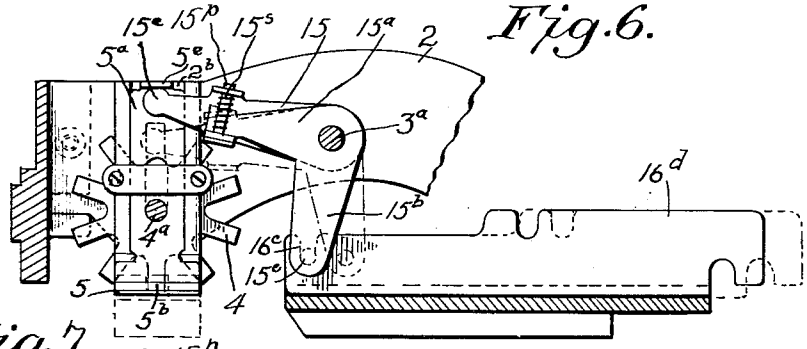


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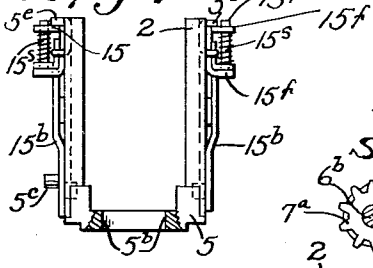


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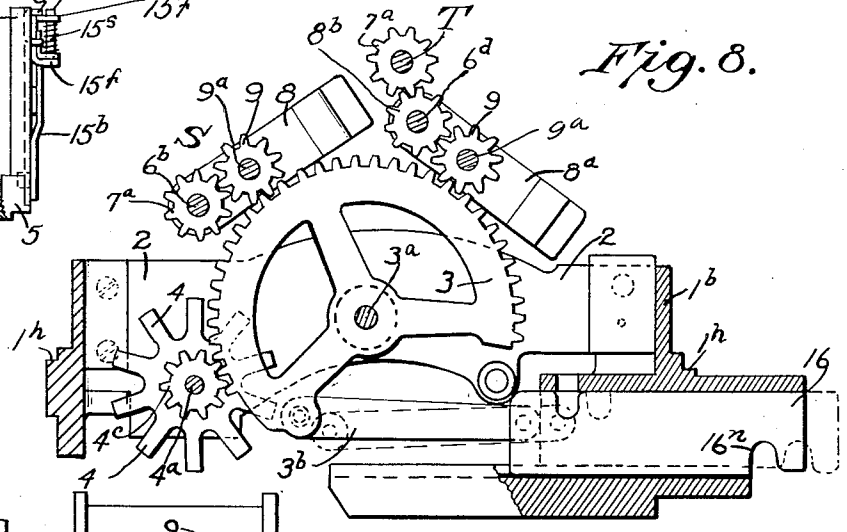
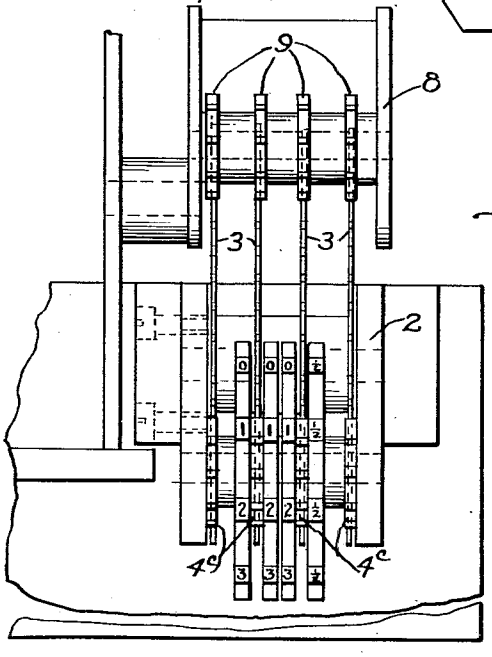


Fig. 9.



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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 11.

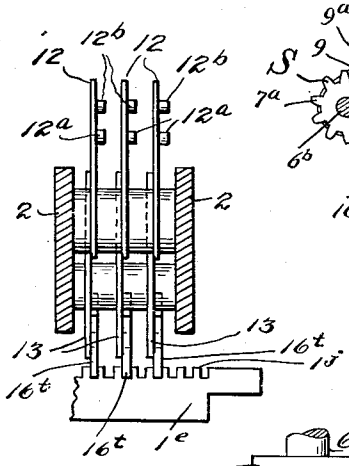


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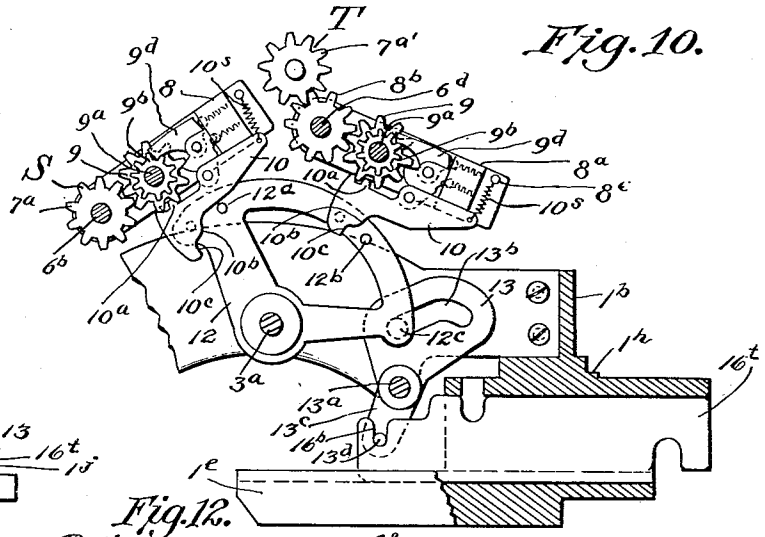


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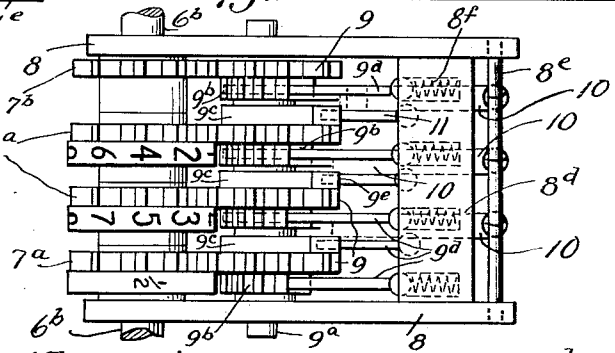


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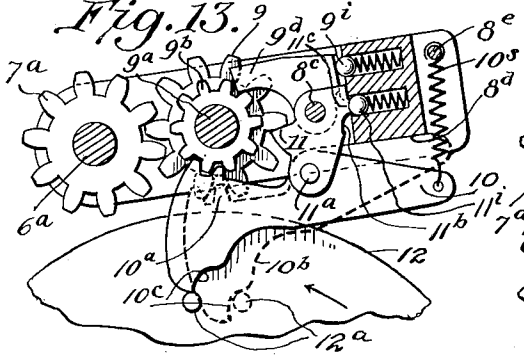


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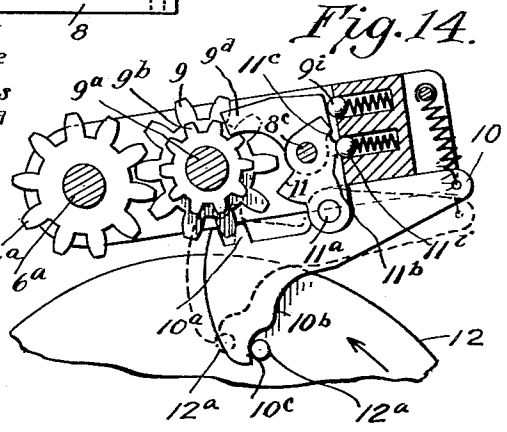


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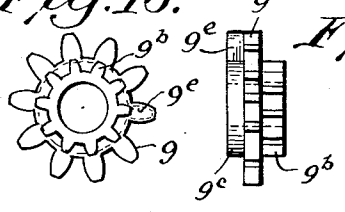


Fig. 16.

Jacob W. Ogden Inventor

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Attorney

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Fig. 17.

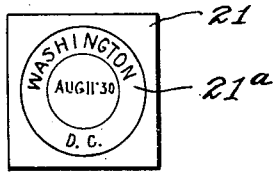


Fig. 17.a

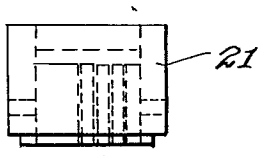


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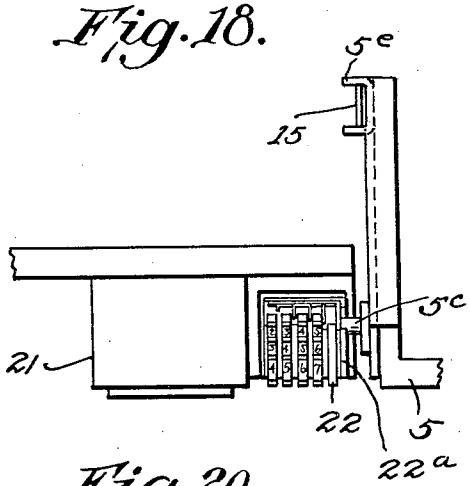


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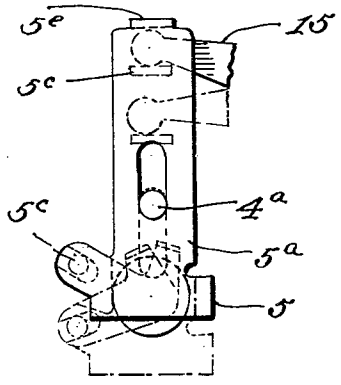


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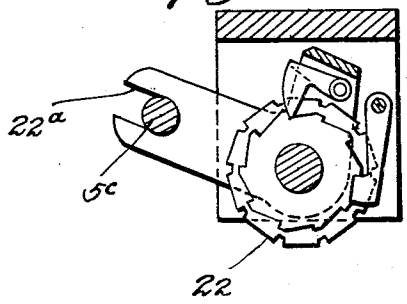
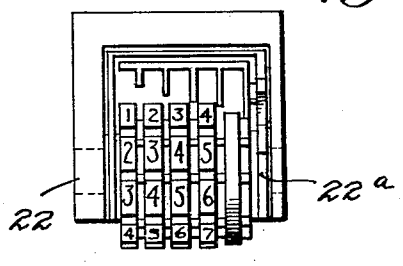


Fig. 21



Inventor

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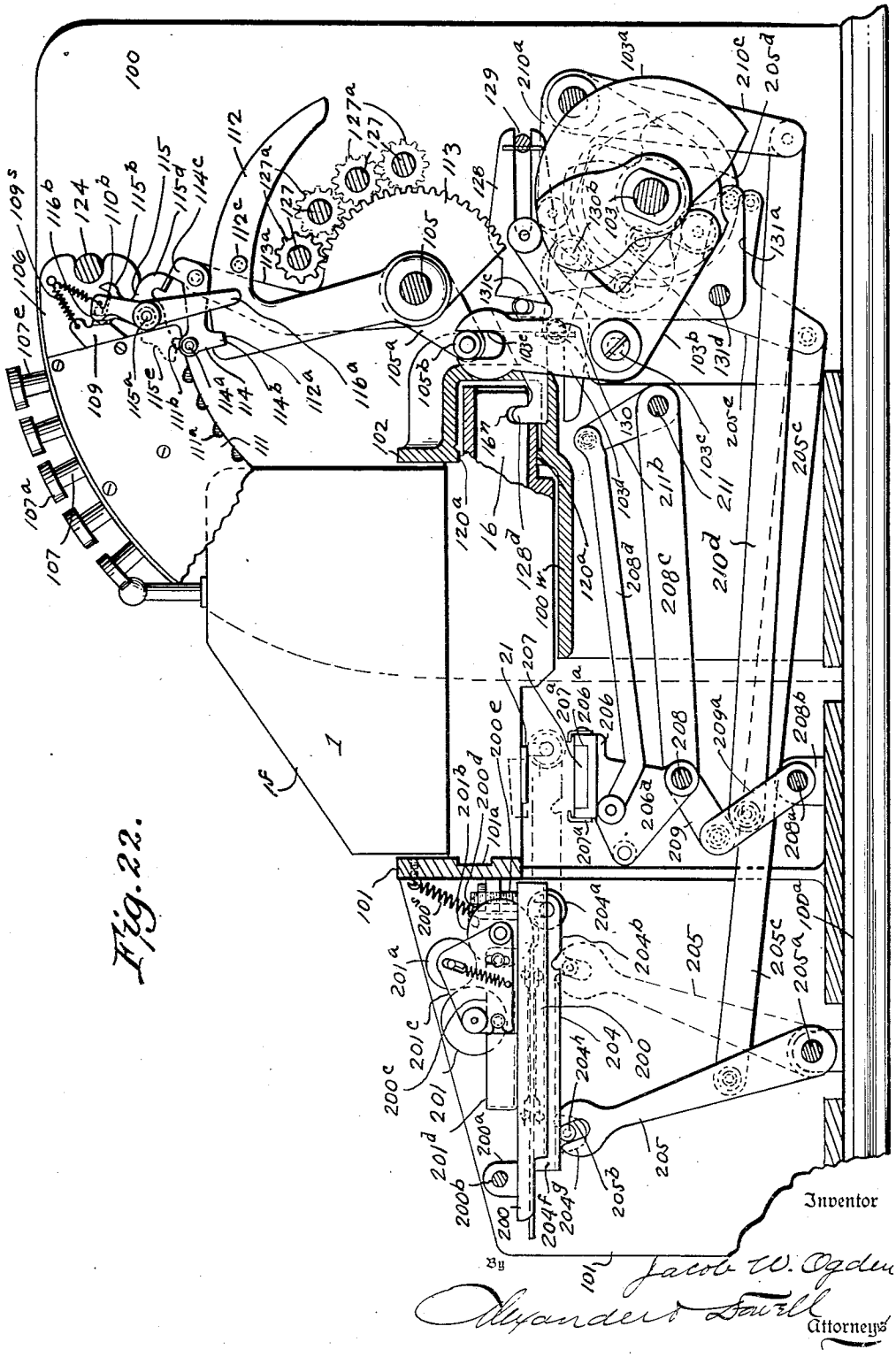


Fig. 22.

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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 23.

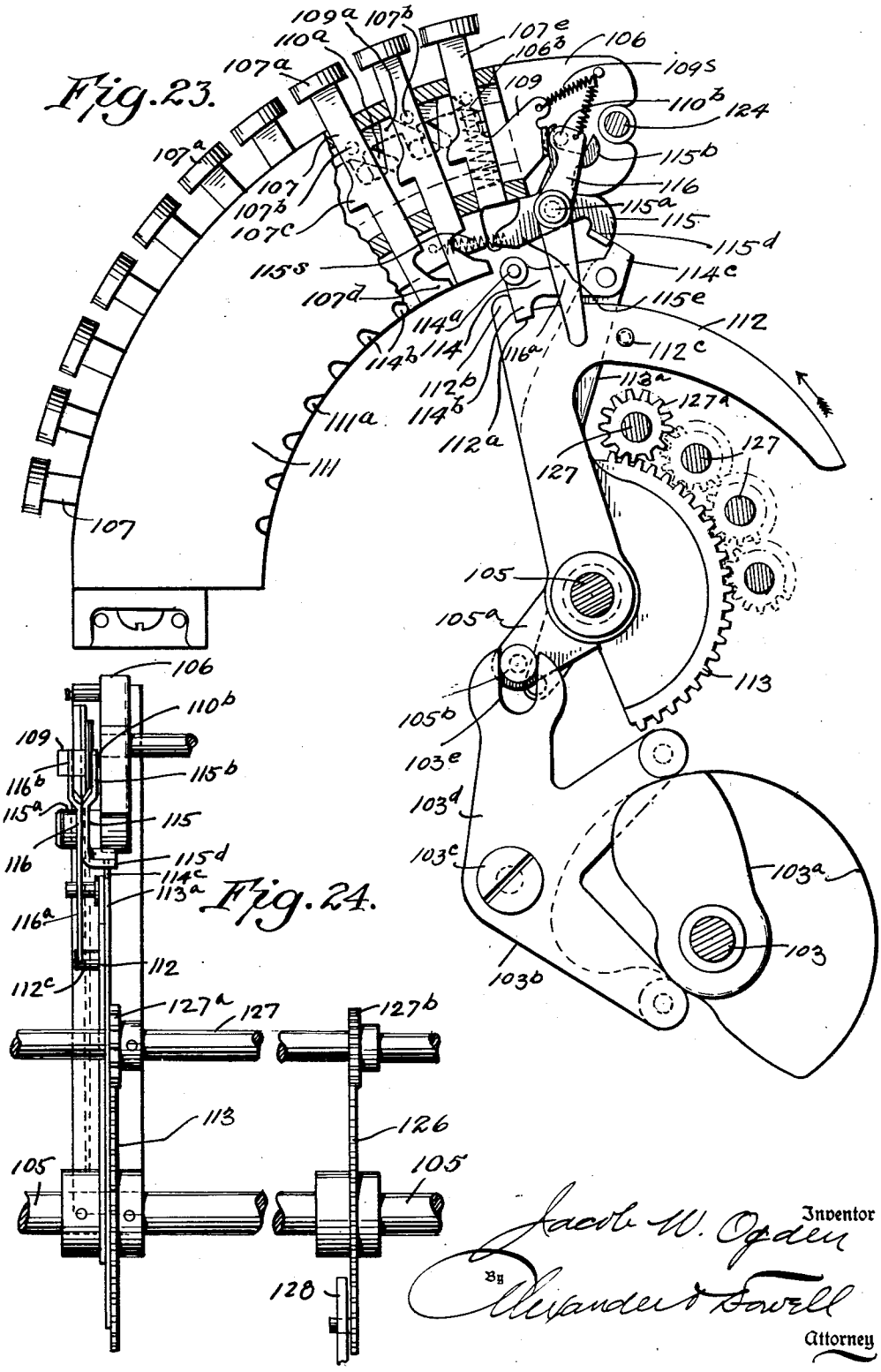


Fig. 24.

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Aug. 25, 1936. J. W. OGDEN 2,052,485

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Fig. 25.

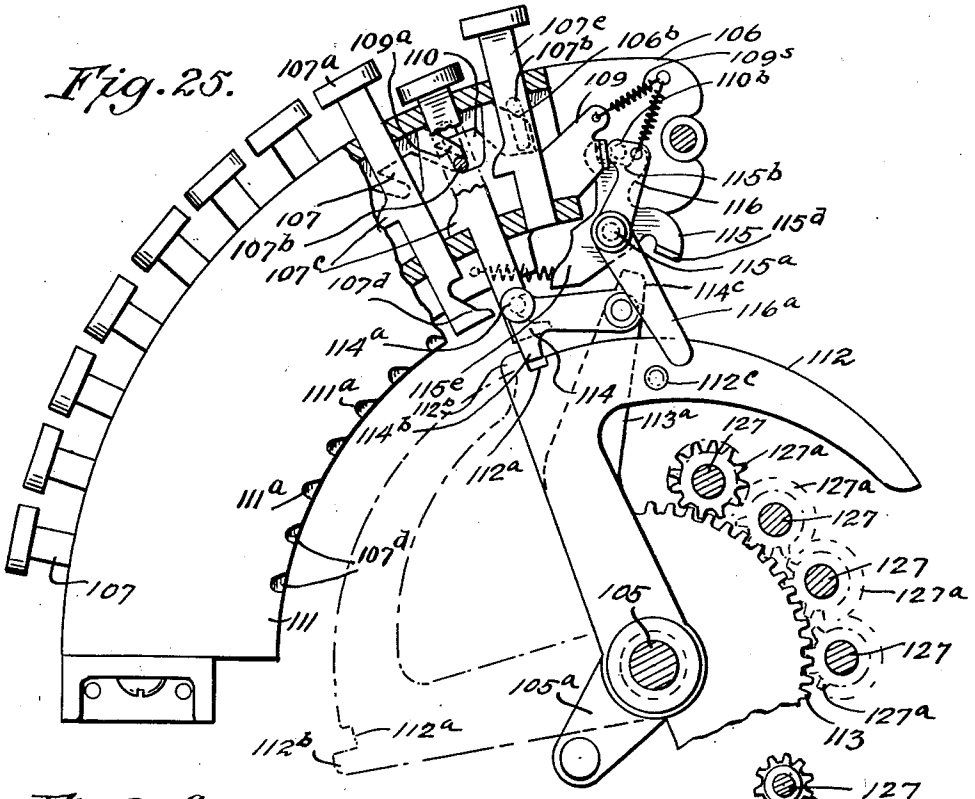


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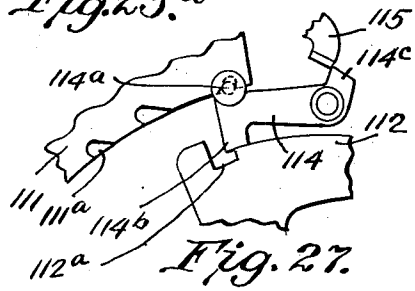
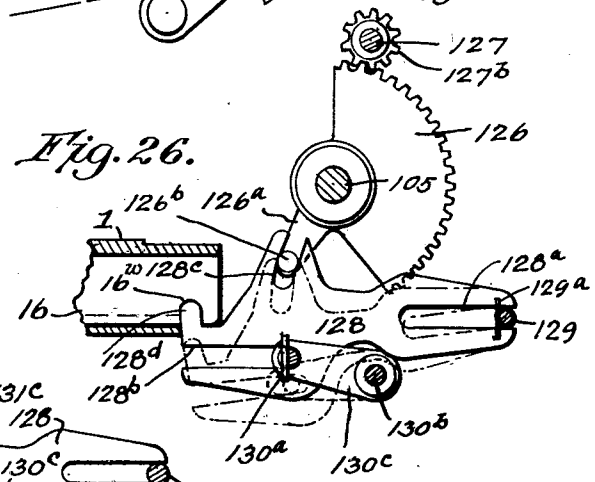
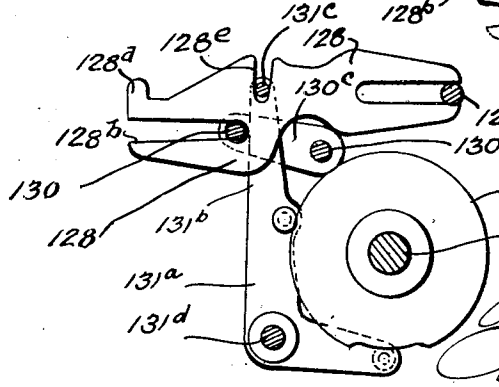


Fig. 27.

Fig. 26.





Inventor

Jacob W. Ogden

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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 28.

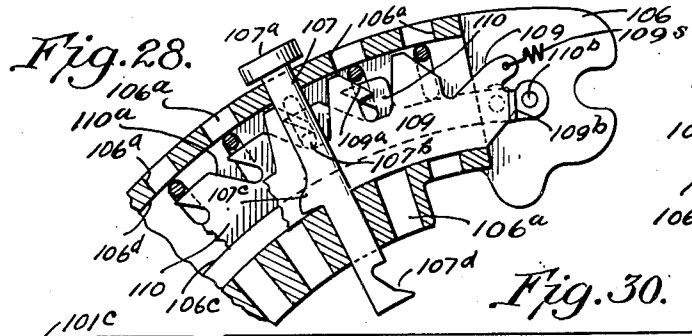


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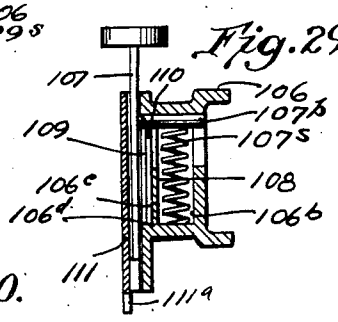


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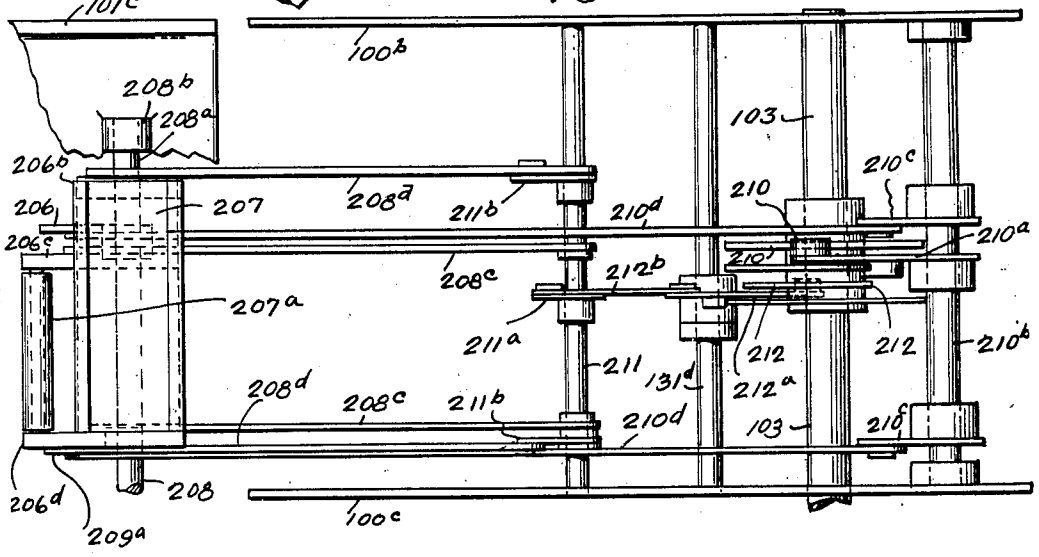
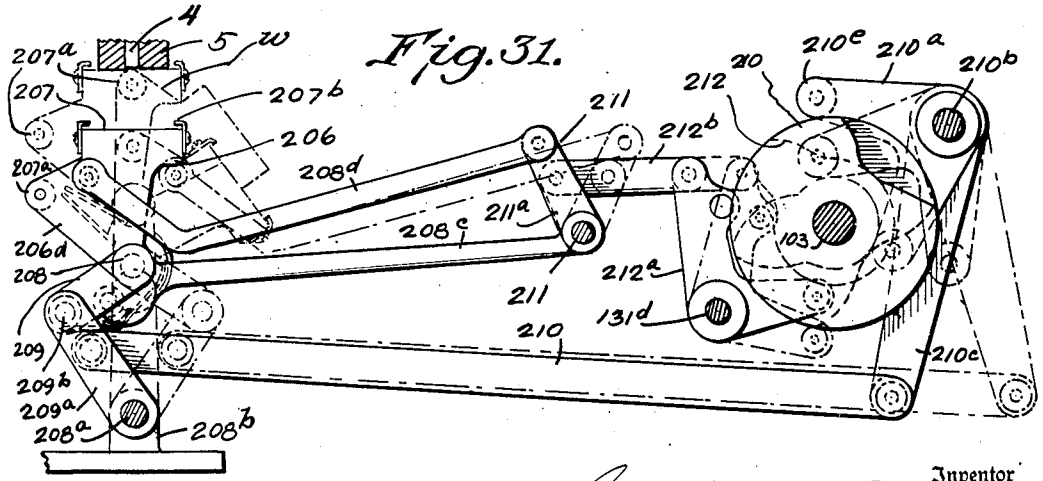


Fig. 31.



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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 32.

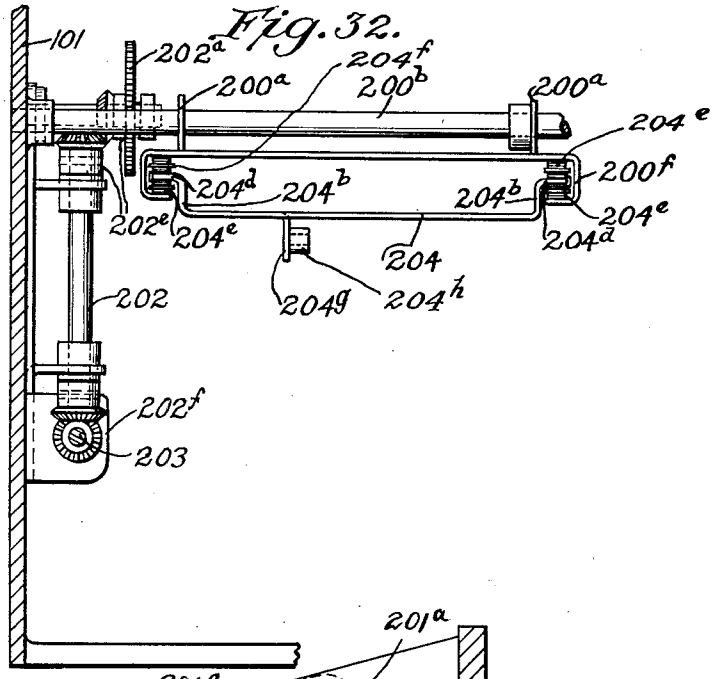
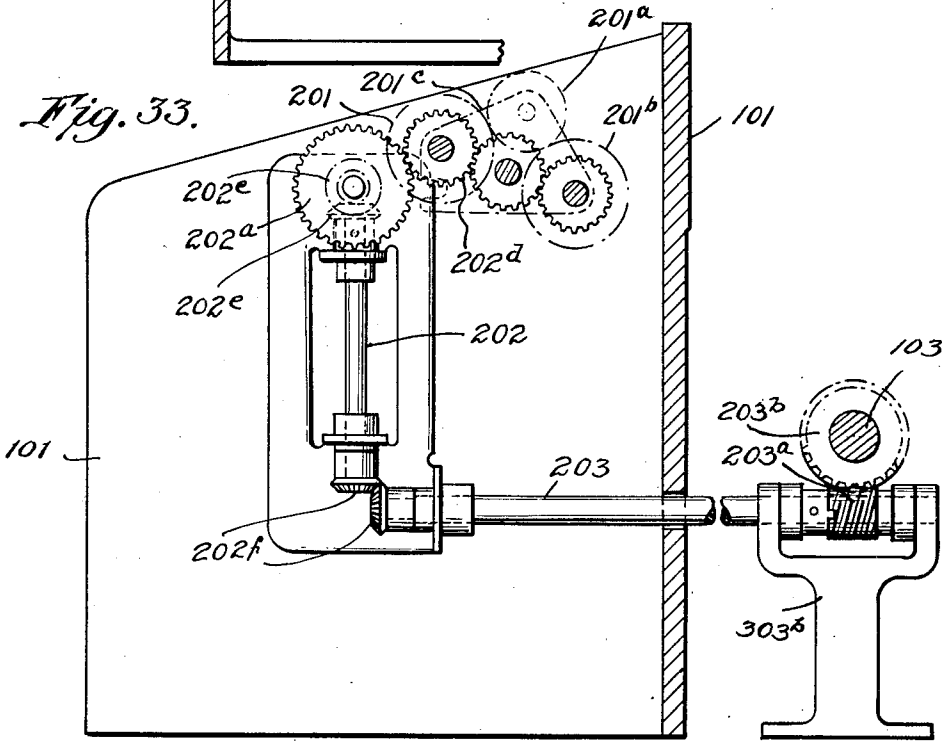


Fig. 33.



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Aug. 25, 1936. J. W. OGDEN 2,052,485

KEY CONTROLLED PARCEL POST MACHINE

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Fig. 34.

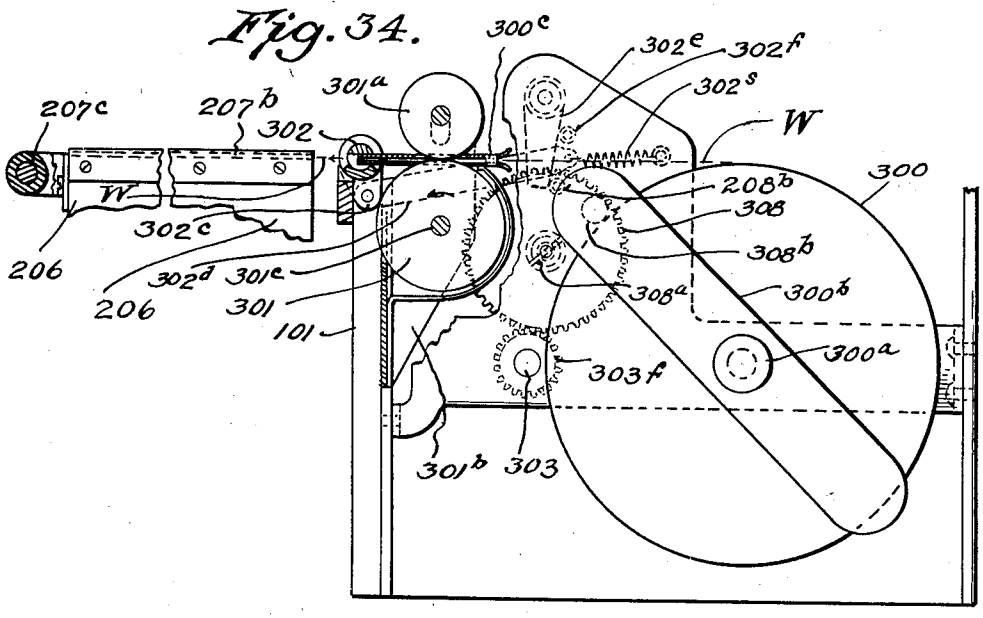
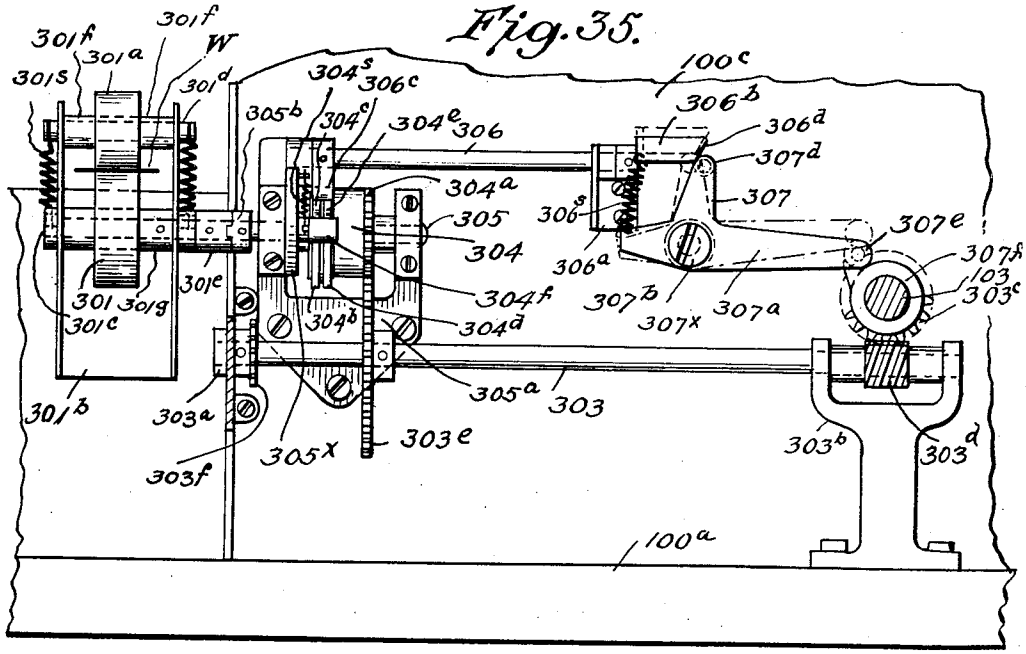


Fig. 35.



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KEY CONTROLLED PARCEL POST MACHINE

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Fig. 36.

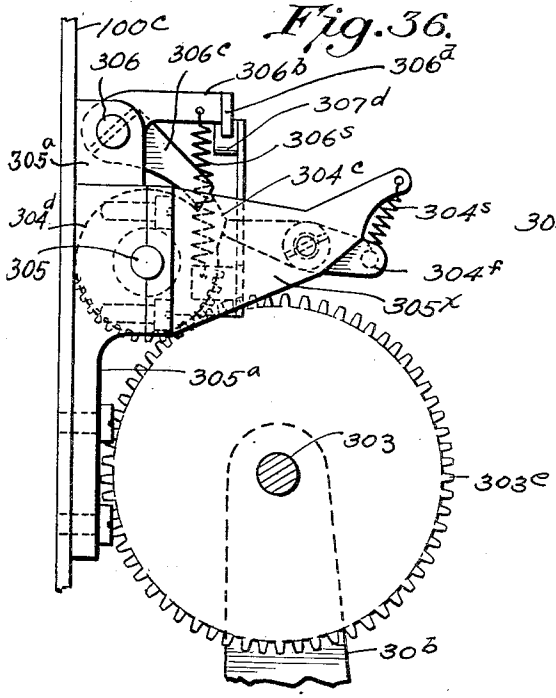


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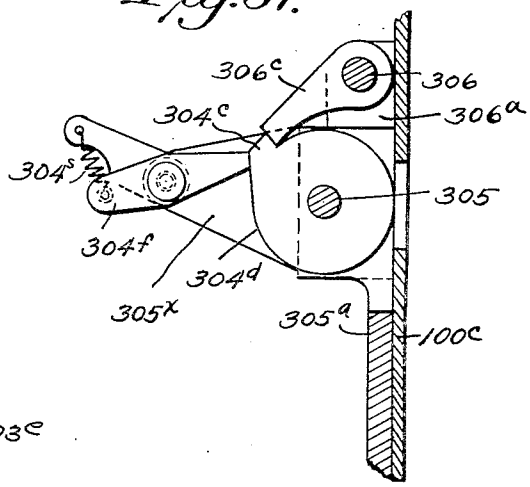


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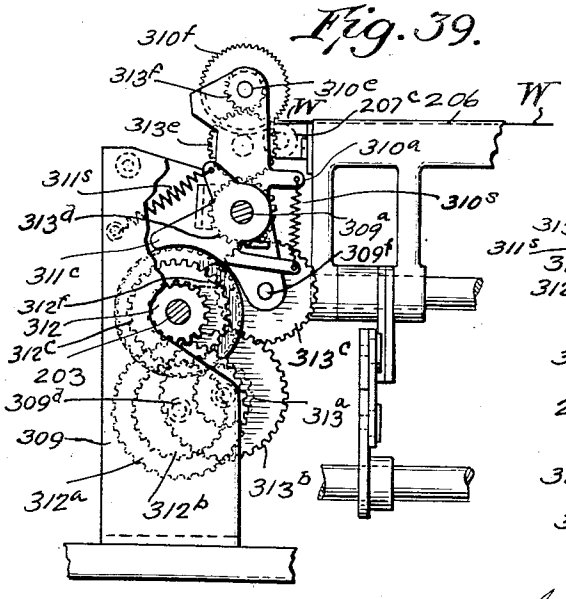
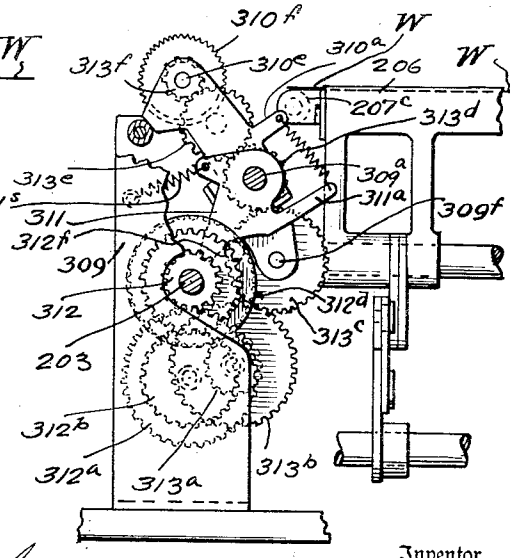


Fig. 38.



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Aug. 25, 1936. J. W. OGDEN. 2,052,485

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Fig. 40.

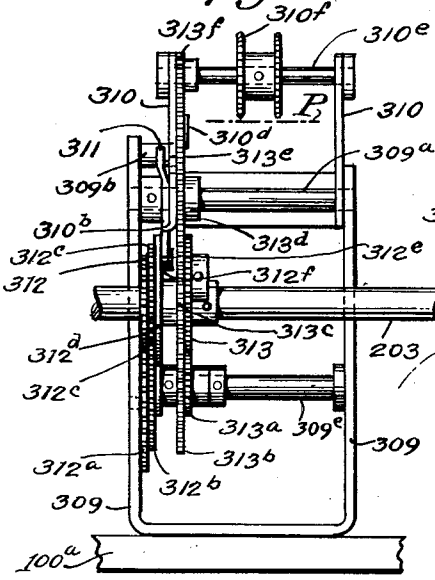


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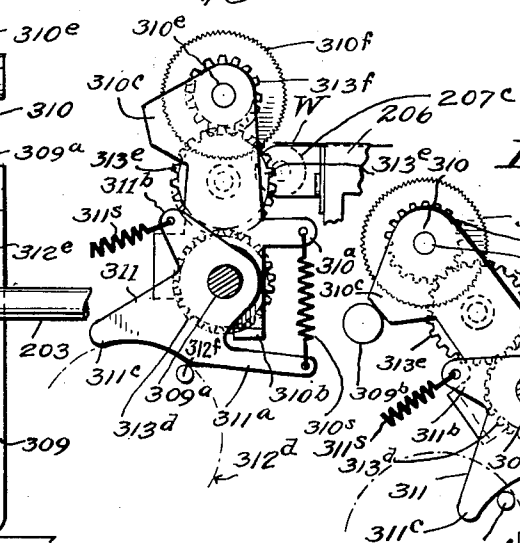


Fig. 42.

Fig. 43.

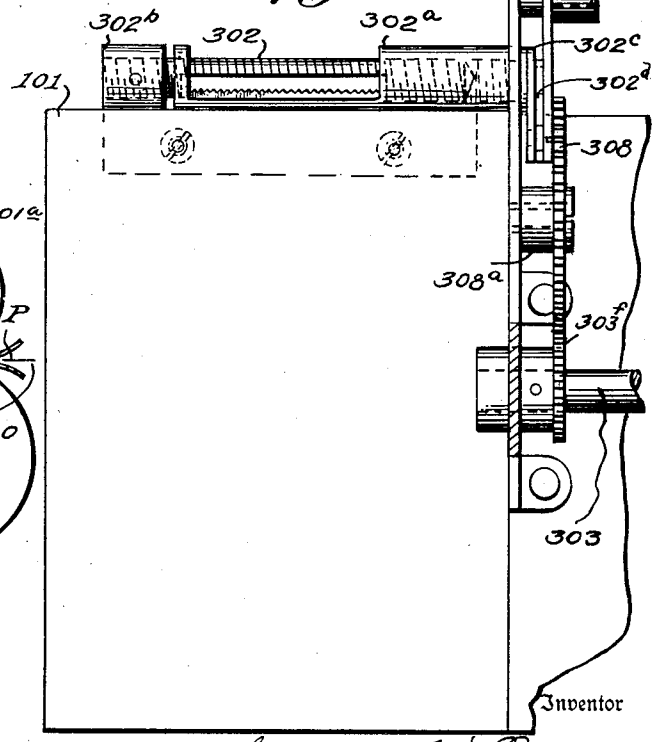
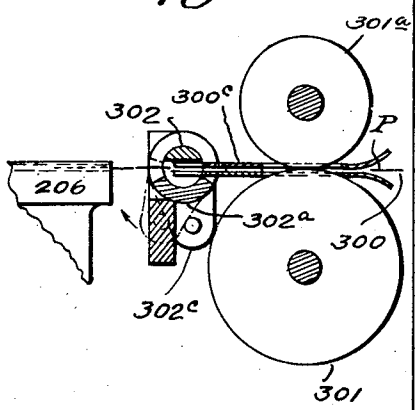


Fig. 44.



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Fig. 45.

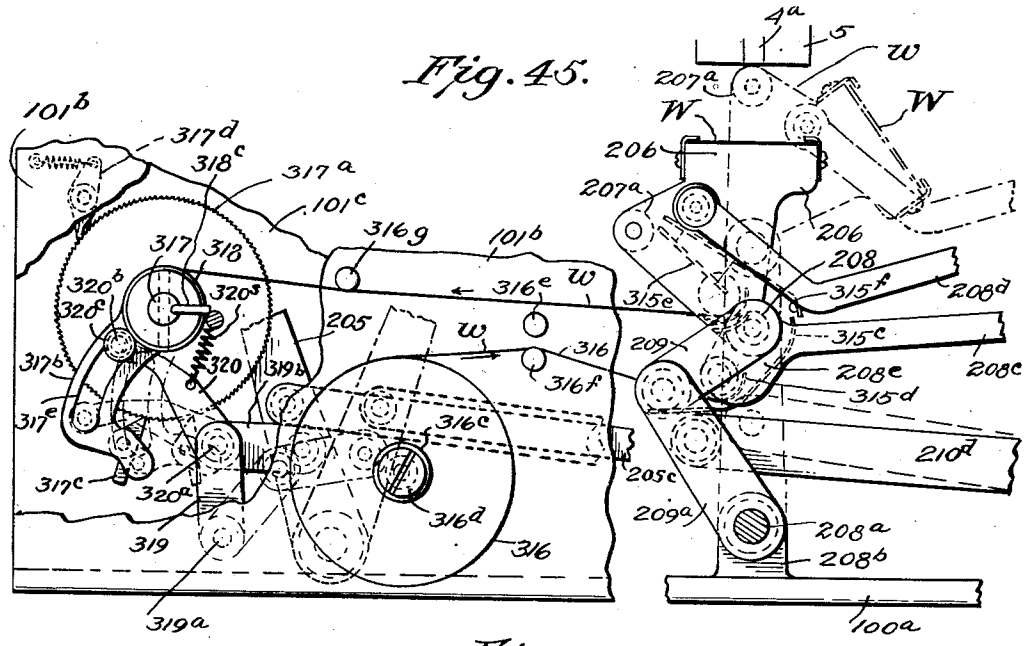
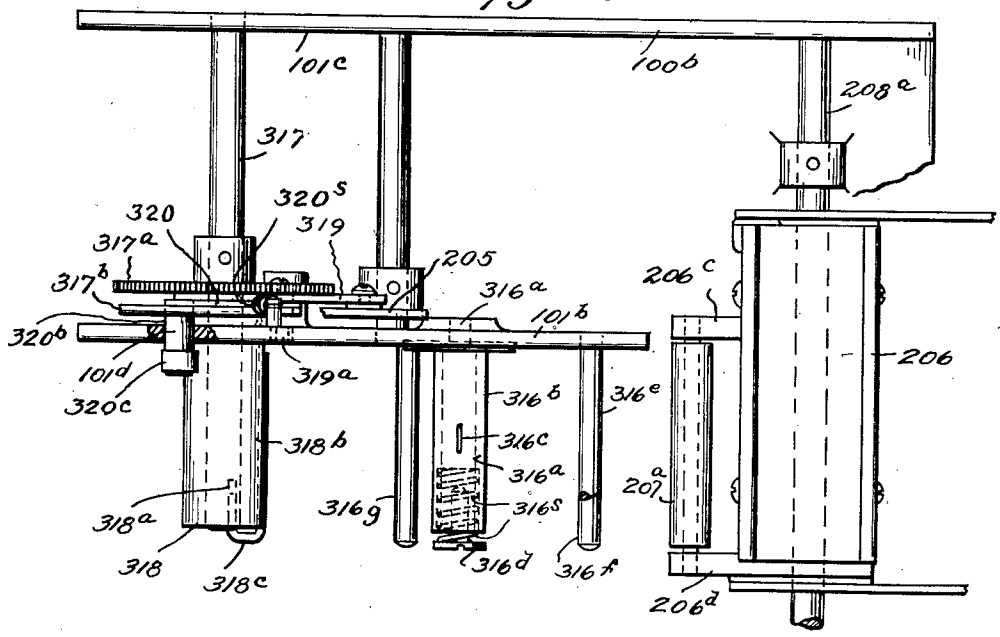


Fig. 46.



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Fig. 47.

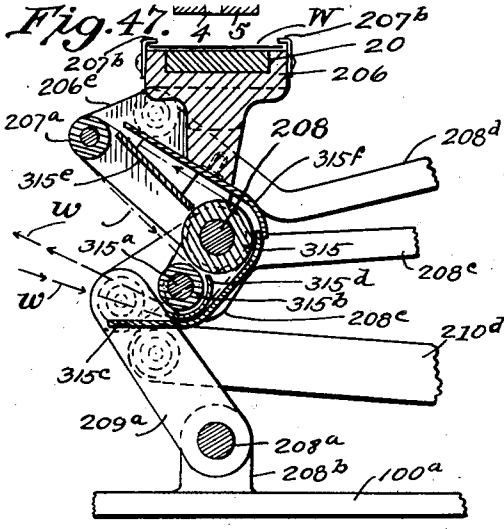


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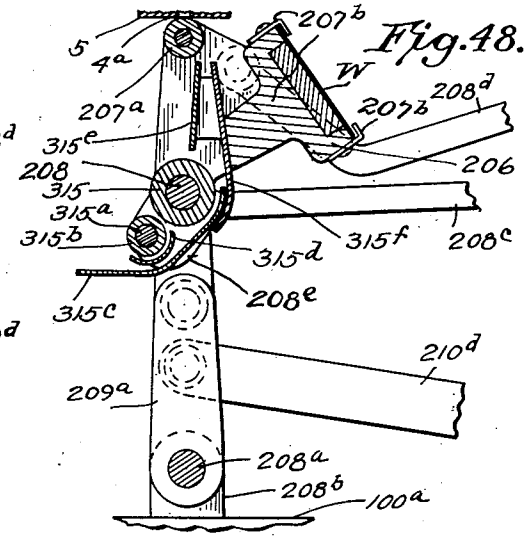
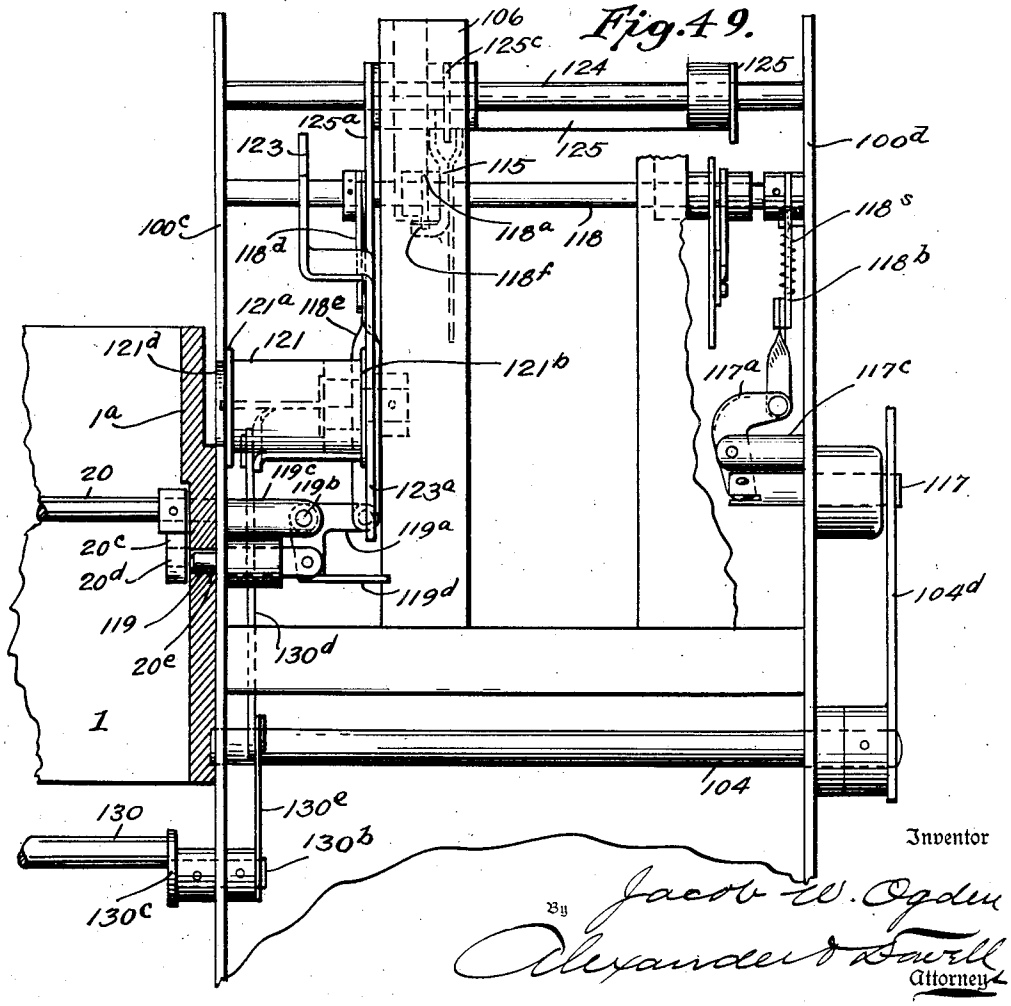


Fig. 49.



Inventor

By Jacob W. Ogden

Alexander & Darell

Attorney

Aug. 25, 1936. J. W. OGDEN 2,052,485

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Fig. 50.

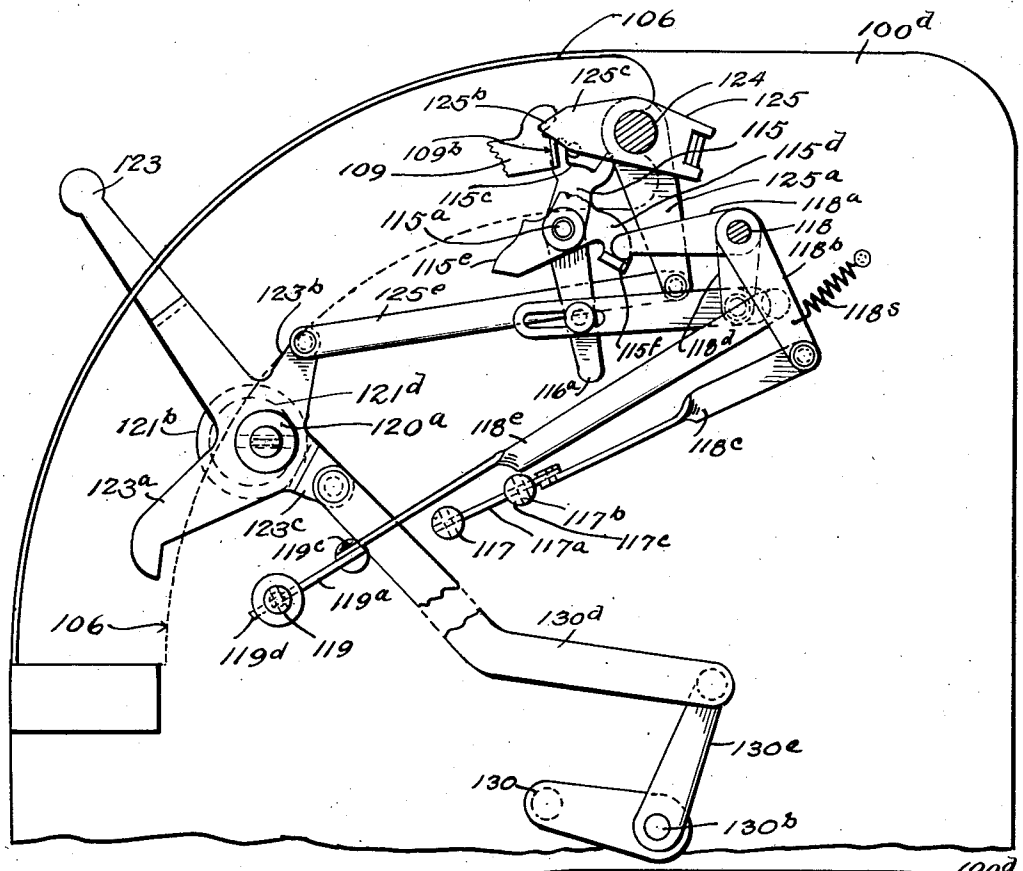
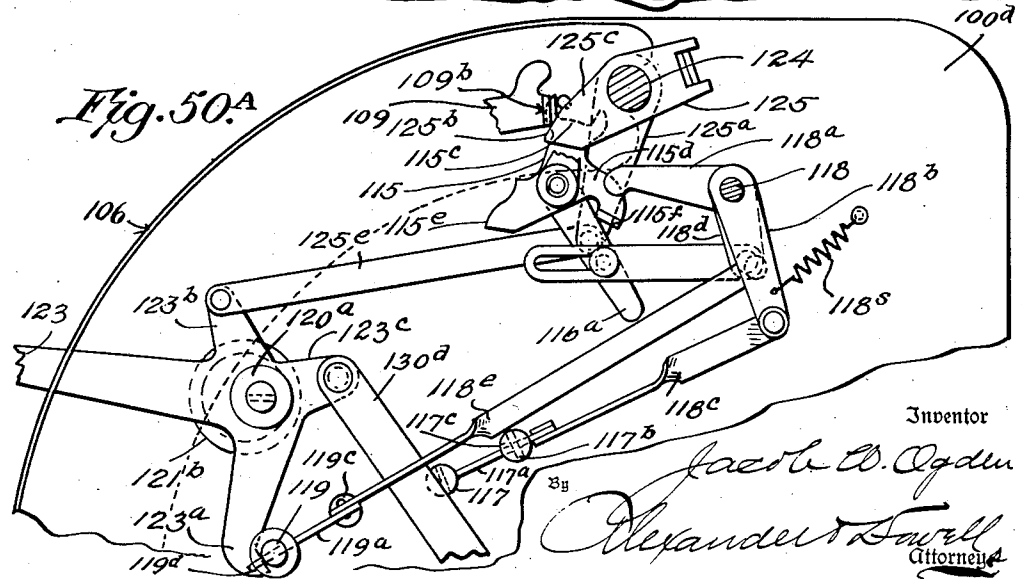


Fig. 50A



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Fig. 51.

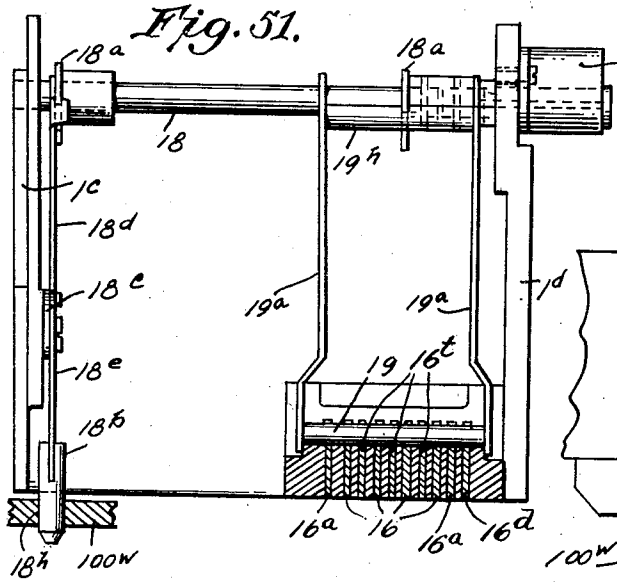


Fig. 52.

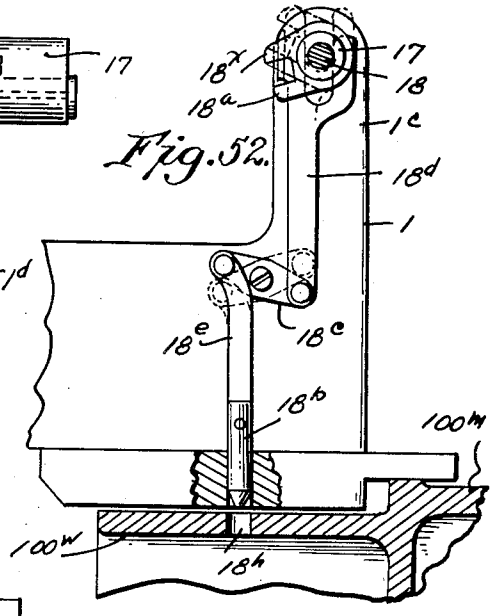


Fig. 53.

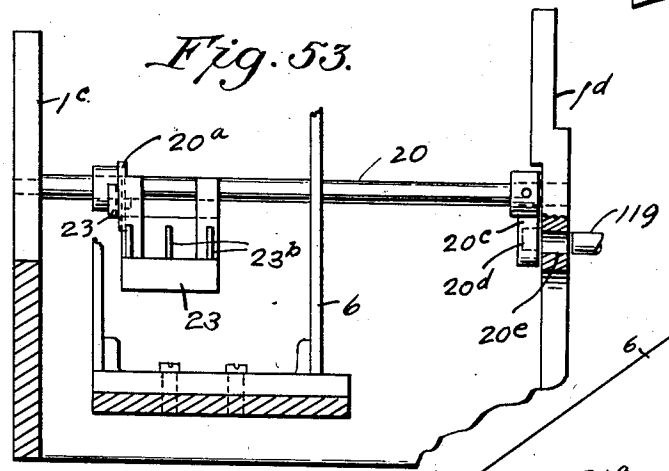
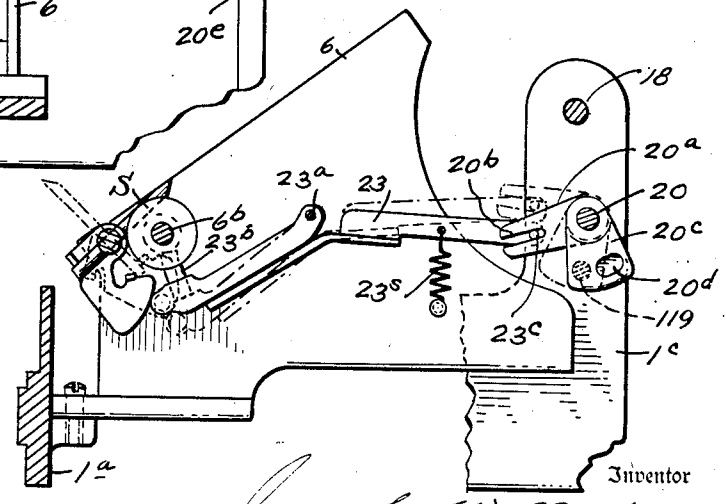


Fig. 54.



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KEY CONTROLLED PARCEL POST MACHINE

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Fig. 55.

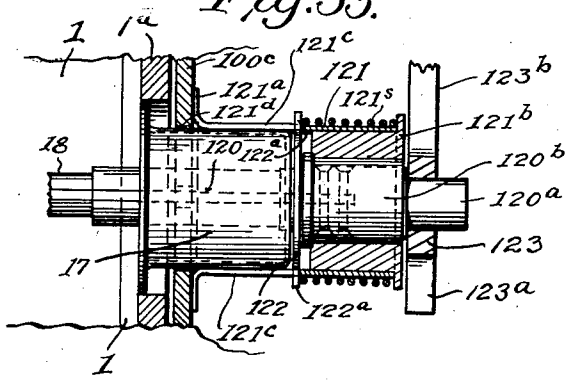


Fig. 58.

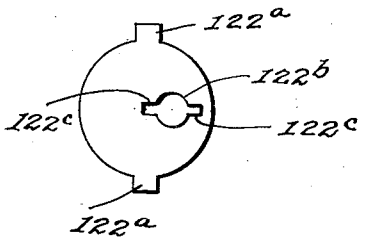


Fig. 56.

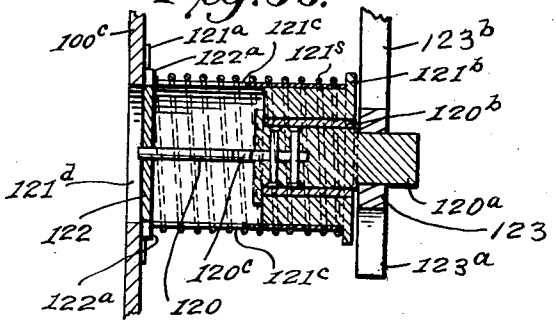


Fig. 57.

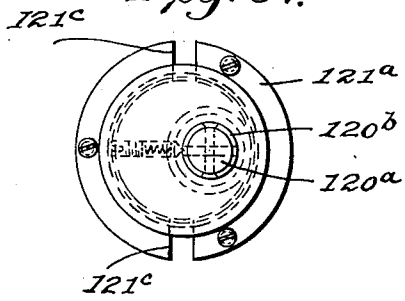


Fig. 60.

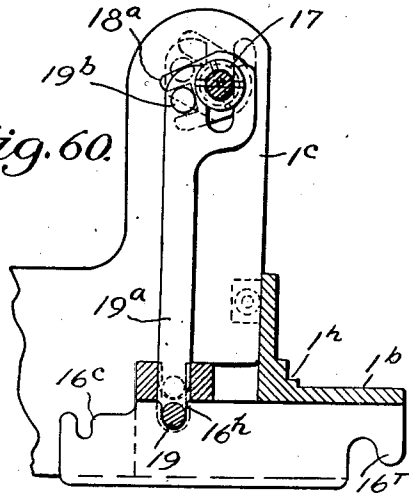
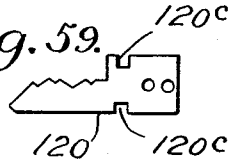


Fig. 59.



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Patented Aug. 25, 1936 2,052,485

UNITED STATES PATENT OFFICE

2,052,485

KEY CONTROLLED PARCEL POST MACHINE

Jacob W. Ogden, Springdale, Conn., assignor to Pitney-Bowes Postage Meter Co., Stamford, Conn., a corporation of Delaware

Application March 30, 1931, Serial No. 526,527

40 Claims. (Cl. 235—101)

This invention relates to so-called "postage meter machines" which print postal indicia on mail matter. The present invention is particularly designed or adapted to print postal indicia on sections of an adhesive strip which can then be attached to mail matter enclosed in bulky containers or packages commonly known as "parcel post" mail matter in the same manner that adhesive postage stamps are now used. Parcel post mail matter varying so much in weight, size and general characteristics that it is not ordinarily possible to print the required postal indicia directly thereon.

One of the essential objects of the present invention is to provide a machine which will print omnia-stamp-indicia, that is any denomination or value of stamp from the smallest to the highest or maximum value of which the machine is capable. For this purpose movable type or numeral printing wheels are provided in such relation to the stamp indicia that any desired value can be printed on and appear as part of the stamp indicia. Another object is to provide such a machine with preferably key controlled devices for "setting up" the type or numeral wheels, so that the operator by depressing the numbered keys in proper sequence will cause the "setting up" of the corresponding type or numeral wheels at the printing point so that such value will be printed on the stamp produced during the cycle of operations of the machine. A further object is to provide the machine with a plurality of registering mechanisms or "counters", at least two being employed, and novel mechanism whereby at each operation of the machine the numerical value of the stamp printed is additively registered in one counter (designated the "total" counter) and subtractively registered in the other counter (designated the "subtracting" counter) so that at any time the total counter will show the total value of the stamps which have been printed, and the subtracting counter will show the balance of prepaid postage which can still be used.

A further object is to provide the machine with novel means whereby an impression may be taken from the stamp indicia at each operation of the machine; and for parcel post usage such impressions are preferably taken upon a gummed paper strip, suitable means being provided for feeding a proper length of this strip between the impression member and the indicia printing devices at each operation of the machine; and for thereafter severing the imprinted portion from the strip so that it can be attached to the mail matter like an ordinary stamp.

A further object of the invention is to provide means whereby the value of each stamp printed is recorded, and for this purpose the machine is provided with novel means whereby during each cycle of operations of the machine after the stamp indicia has been printed on the strip as above stated, a second impression is taken from the value printing type upon a record tape, novel means being provided for feeding an endless record tape between the dies and impression member in such manner that after the stamp indicia has been printed upon the strip a second impression is taken from the value type upon such tape, so as to make and preserve on the tape a complete record of the value of each individual stamp printed by the machine.

The printing die and the counters are contained in a so-called "meter", which is preferably detachably attachable to the machine and can be carried to the post office, where the proper official can set the subtracting register to show the amount of prepaid postage which has been purchased; and when the meter is replaced in the machine the latter can be operated to print a stamp of any desired value, or various stamps of any desired value, as desired up to the maximum capacity of the machine until the total value of the stamps printed equals the amount of the prepaid postage purchased.

The machine is also provided with locking means controlled by the subtracting counter, whereby when the aggregate value of the successive individual imprints equals the amount for which the subtracting counter was set the mechanisms will be automatically locked; and no more stamp impressions can be made until the meter has been recharged by resetting the subtracting register for another amount of prepaid postage. The meter may be made inseparable from the machine, but is preferably detachable so that only the meter need be carried to the post office for recharging. When the meter is detachable automatic locking devices are provided whereby when the meter is removed the mechanisms in the meter cannot be effectively operated, and the other parts of the machine are also rendered ineffective. The machine is also provided with various locking devices and safety devices whereby the taking of an improper or fraudulent impression from the stamp indicia will be effectively prevented.

The stationary unit of the machine or part upon which the meter is mounted contains selective and actuating mechanisms designed to cooperate with the mechanisms in the meter to produce the printed indicia and register the values

thereof. Neither the stationary unit nor the portable unit or meter is sufficient in itself to produce a stamp or impression thereof; the units must be properly connected and locked together in order that their mechanisms may become effective and cooperate in producing stamp indicia and recording the value thereof.

The accompanying drawings illustrate one practical embodiment of the invention in a parcel post postage meter machine for printing omnia stamp values, or any value of stamp, from the lowest up to the highest, of which the machine is capable. The machine illustrated is adapted to print stamp values up to four figures, but its capacity may be indefinitely varied.

I will describe the machine with reference to said drawings; and thereafter set forth in the claims the essentials of the invention and the novel features of construction and novel combinations of parts for which protection is desired.

In the said drawings;

Fig. 1 is a front view of the complete machine.

Fig. 2 is a reduced left hand end view thereof.

Fig. 3 is a reduced right hand end view thereof.

Fig. 4 is a sectional view through the meter.

Fig. 5 is a front view of mechanisms in the meter with the cover removed.

Fig. 6 is a detail view of the devices for raising and lowering the indicia printing die.

Fig. 7 is a detail front view of the die carrier and its raising and lowering devices.

Fig. 8 is a detail view of the mechanism for shifting the printing wheels in the meter and also of the device for actuating the adding and subtracting registers therein.

Fig. 9 is a front view of the devices shown in Fig. 8.

Fig. 10 is a detail view of the counter actuating mechanism.

Fig. 11 is a detail front view of Fig. 10.

Fig. 12 is an enlarged top view of one of the counting mechanisms detached.

Figs. 13 and 14 are enlarged detail views illustrating the devices for transferring accumulated excess of units of a low denomination in the counter to the next higher numeral wheel.

Figs. 15 and 16 are detail front and side views of one of the counter actuating gear units.

Figs. 17 and 17*a* are face and side views of the postmarking die.

Fig. 18 is a detail view showing the serial numbering devices interposed between the postmarking die and the stamp indicia die.

Fig. 19 is a right-hand end view of Fig. 18.

Fig. 20 is a detail sectional view of the serial numbering counter.

Fig. 21 is a front view of the numbering counter, detached.

Fig. 22 is a side elevation of the machine partly in section and partly broken away showing the operative parts.

Fig. 23 is an enlarged view of the key controlled setting-up devices.

Fig. 24 is a detail view of one set of setting-up devices.

Fig. 25 is a view similar to the upper part of Fig. 24 showing a different position of the parts.

Fig. 25*a* is a detail.

Figs. 26 and 27 are detail views of the connections between the key actuated devices and the meter slides.

Figs. 28 and 29 are detailed sectional views of the key holders.

Fig. 30 is a plan view of the platen and platen operating devices.

Fig. 31 is a side view of the devices shown in Fig. 30.

Fig. 32 is a detail view of part of the inking mechanism.

Fig. 33 is a detail view showing the gearing for driving the ink supply and distributing rollers.

Fig. 34 is a front view, partly broken away, of the mechanisms for feeding the web or strip to the platen.

Fig. 35 is a detail view of the mechanism for actuating the strip feeding rollers.

Figs. 36 and 37 are detail views of the means for controlling the length of strip feed.

Figs. 38 and 39 are detail side views of the mechanism whereby the severed strip is ejected after it has been printed showing the ejecting wheels in different positions.

Fig. 40 is an end view of Fig. 39.

Figs. 41 and 42 are enlarged detail views of the devices for operating the strip ejector wheels showing same in two positions.

Fig. 43 is a detail view of the strip cutting devices.

Fig. 44 is a detail sectional view thereof.

Fig. 45 is a diagrammatic side view partly broken away of the record tape, feeding, printing and re-winding mechanisms.

Fig. 46 is a detail plan view of Fig. 45.

Figs. 47 and 48 are detail sectional views illustrating the different positions of the platen in printing the record tape.

Fig. 49 is a detail top view of various safety locking devices in the machine.

Fig. 50 is a side view of the locking devices shown in Fig. 49.

Fig. 50*a* is a view similar to Fig. 50 showing the parts in a different position.

Fig. 51 is a detail view of the devices for locking the slides in the meter when the latter is removed from the machine, and also the means for locking the meter in position in the machine.

Fig. 52 is a detail view of the means for locking the meter in the machine.

Figs. 53 and 54 are detail views illustrating the means for locking the subtracting register, and also of the means for preventing proper entry of the meter pin when the subtracting register is exhausted.

Figs. 55 and 56 are detail views of the devices for locking or unlocking the meter when it is in position in the machine.

Figs. 57, 58, and 59 are detail views of the locking devices in Figs. 55 and 56.

Fig. 60 is a detail view of the means for locking the slides in the meter.

The machine shown has a base **100***a*, upon one end of which is mounted a casing having an upwardly extending portion **100** which contains the key controlled setting up devices. On this casing at one side of the portion **100** is mounted the meter **1** hereinafter referred to. The portion **100***m* of the casing, in front of which the meter **1** is placed, contains the cam mechanism and selective slide operating devices, whereby the slides which connect the key controlled mechanism with the printing devices and the counter operating devices in the meter are actuated. On the base is also mounted a casing member **100***p* in which is enclosed the inking mechanism hereinafter referred to and part of the record tape actuating mechanism.

In the machine shown the printing mechanism and registering mechanism are in the meter **1**, and the meter is removable as hereinafter explained, but this is a matter of convenience and

in some constructions such mechanisms might be mounted within a portion of the casing practically conforming in exterior appearance to the meter 1. To facilitate an understanding of the invention I will explain the several mechanisms in sequence.

The printing mechanism

The printing die 5 (Figs. 4, 5) is connected at its ends to slides 5a which are guided in opposite side members of a frame 2 which is mounted within the lower portion of the meter frame 1, (Figs. 5 to 9). The members 5a have lugs 5e which are engaged with arms 15 fixedly mounted on a shaft 3a in frame 2, see Fig. 7, and these arms 15 are yieldably connected with one arm 15a of a bell crank pivoted on the shaft 3a, and the other arm 15b of the bell crank has a pin 15c which engages a slot 16c in a slide 16d that extends out of the meter casing through a suitable guide (Figs. 4 and 6) and is operable, as hereinafter described, so as to raise and lower the die 5b at the proper times.

The die 5 is provided on its lower face with suitable stamp indicia when the machine is used for printing postage. If it is to be used for other purposes, such as ticket printing or the like, the indicia on the die would be made accordingly.

Preferably the arm 15a engages a pin 15b fixed between lugs 15p on arm 15 and normally held in contact with the lower lug 15f by a spring 15s (Fig. 6). In the example shown the die 5 has a longitudinal slot 5b for the entry of movable type which print the numerical value of the stamp simultaneously with the printing of the indicia. In the construction shown the movable type are respectively engraved or rigidly mounted on numeral wheels 4 which are rotatably mounted on a transverse shaft 4a mounted in the frame 2 (Figs. 4, 5, 8, and 9). Each printing numeral wheel 4 has ten radial arms, which bear on their outer ends the type numerals 0 to 9 respectively; and by turning the wheel any numeral can be brought to printing position (Fig. 4), so as to register with the opening 5b in the die 5. There will be one or more of these numeral wheels according to the highest stamp value which it may be desired to print, there being one numeral wheel for units, tens, hundreds, etc.

At the beginning (and end) of an operation the die 5 is in the position indicated in dotted lines in Figs. 4 and 7; in which position the numeral wheels can be rotated without interfering with the die. When the die is raised to position shown in full lines in Figs. 4 and 7, the lowermost arms 4b of the several type wheels will enter the slot 5b in the die and the type thereon are flush with the printing surface of the die, and are locked in printing position by the die. An impression can then be taken therefrom by suitable means as hereinafter explained.

When the die 5 is in lowered position each numeral wheel can be rotated to bring any desired printing numeral thereon into printing position. For this purpose each numeral wheel 4 has a pinion 4c which meshes with a related arcuate rack or sector 3 (Figs. 4, 8, and 9) which is mounted upon a shaft 3a in the frame and is connected by a link 3b to a slide 16 (Fig. 8) which is arranged beside the slide 16d and projects out of the meter 1 (Figs. 4, 8, and 22). Longitudinal movement of slide 16 will impart rotative movement to its related sector 3, and this in turn will rotate the related numeral wheel 4. Thus by properly shifting the slide 16 the desired numeral is brought to printing position, and registers with the slot 5b in the die 5. The slide 16 is operated from a related set of keys projecting through the casing as hereinafter explained (see Figs. 1 and 22).

The total and subtracting registers

It is important in postage meter indicia printing machines that the total value of each stamp printed be registered or recorded so that at any time the amount of postage that has been used can be determined; and also necessary in such machines that a so-called "subtracting" counter be provided whereon the numerical amount of value of postage paid for can be set by a postmaster and in which register the numerical value amount of each stamp printed by the machine shall be subtracted when such stamp is printed. For this purpose we have provided in the meter the counters indicated at S and T. The counter S being the subtracting register and the counter T being the total register. These counters are constructed alike but are reversely operated, so one counter subtracts while the other adds.

In the casing adjacent and to the left of frame 2 is secured a frame 6 (Figs. 4 and 5) which supports the counters T and S. The numeral wheels of these counters are visible through glazed openings in the cover of the meter for sight reading and the numeral wheels of counter S are accessible through a door in the casing, and can be manually set to any desired reading by the proper official.

In the particular construction shown, the figures appearing at the sight openings represent dollars, cents, and mills. A mill therefore is the unit of the system; but as the half cent or 5 mills is the only mill denomination required, the vulgar fraction ½ for 5 mills, and a colon for zero mills, is used both in the printing dies and the counter wheels that represent mills at the sight openings. A wider space is also left between the dollars and cents. This is not an essential part of the design but is introduced for convenience in reading the amounts.

All of the numeral wheels of counter T are mounted on a shaft 6t in frame 6 and all of the numeral wheels in the counter S are mounted on a shaft 6b in said frame 6. A description of the construction and operation of one counter will explain the other, as similar parts are similarly lettered in the drawings, and the slight minor differences are hereinafter noted. The fourth wheel (representing units of dollars) of the counter, is fastened to its shaft 6b (6t) and turns with it. The other numeral wheels are free to turn on the shaft.

Each numeral wheel 7 is revolved by a gear wheel 7a, which wheels 7 are integral with the figure wheels representing mills and cents, but are spaced from the unit dollar wheels 7b and fastened to the shafts 6b (6t). The unit dollar wheels are within the frame 6, while the cents and mills wheels are on the projecting ends of the shafts outside the frame.

Pivoted on the shaft 6b (6t) and enclosing the mills and cents wheels 7 and their associate gear wheels 7a and 7b is a frame 8 (Figs. 4, 5 and 9 to 14), and loosely mounted on a shaft 9a fixed in frame 8 are gears 9, one for meshing with each gear 7a and 7b, and each gear 9 meshes with a related gear sector 3 on shaft 3a. The frame 8 may be swung on the shaft 6b (6t) by means of a sector 14 (Figs. 4 and 5) pivoted at 3a in frame 2, and provided with

cam slots 14b into which project the ends of shafts 9a. When the frame 8 is in its lower position (Fig. 8) each gear 9 will be in mesh with its related sector 3 and any motion applied to such sector will be communicated through gears 9 and 7a to the related figure wheel in counter S, and through gears 9, 8b and 7a to the related figure wheel in counter T. The intermediate gear 8b (Fig. 10) causes the numeral wheels of the totalizing counter T to turn in a reverse direction to those of counter S, so that the total counter accumulates while counter S subtracts. When the frames 8 are raised to their upper positions by the reverse movement of sector 14 the gears 9 will be carried out of mesh with the sectors 3 and will not affect the counters on the reverse movement of sector 3.

The action of the parts thus far described, whereby the changing of the denomination of the imprint will cause a like amount to be added in counter T and subtracted in counter S is as follows;

Normally (that is at the end of a complete cycle of operations) the printing die 5 is in raised position with the "zero" type arm of each numeral printing wheel 4 entered in the slot 5b, and the counter carrying frames 8 and 8a are in lowered position (Fig. 8) with the gears 9 in mesh with the gear sector or sectors 3. At the beginning of another cycle of operations (first) the die 5 is lowered to position shown in dotted lines in Figs. 4 and 6 clear of the numeral wheels. (Second). The gear sectors 3 are shifted to selected position (by means hereinafter explained) each sector turning its related printing wheel 4, and the related counter wheels 7 the proper relative extent. The gear 4c of each numeral printing wheel 4 has ten teeth and the gear wheels 7a of each counter wheel 7 has ten teeth, therefore both the type wheel and the counter wheels will be rotatorially advanced the same amount. (Third) The die 5 is then raised and the lowermost type arms on the numeral wheels enter the slot 5b in the die. (Fourth) The die is inked and an impression taken as explained later. (Fifth) The die 5 is lowered to the position shown in dotted lines Figs. 4 and 6, releasing the type arms 4b. (Sixth) The sectors 3 are moved back to the zero position, and in so doing return the printing wheels 4 to zero position; and finally; (Seventh) The die 5 is again raised engaging the zero-type arms of the numeral wheels and simultaneously the frames 8 and 8a are lowered until gears 9 again mesh with the sector 3. During the aforesaid cycle of operations the printing wheels and the counter wheels have been advanced a like amount, but while the type wheels have also been returned to zero position, the counter wheels are not affected by the return movement of the sector 3. Therefore the numerical value of the amount printed at each operation is accumulated in the total counter T and subtracted in the counter S.

As each sector 3 represents but one column of figures (i. e. units, tens, hundreds or thousands) and actuates only its related type and counter wheel; therefore other means must be provided for transferring an accumulated excess of ten units into the tens column, of tens into the hundreds, and of hundreds into thousands, etc. This is accomplished by novel mechanisms in the swingable frames 8 and 8a.

The counter transfer devices

Referring to Figures 10–16 each gear 9 which operates the counter gear 7a or 7b has ten teeth, and also has a small pinion 9b on one side (Figs. 12 and 16), also having ten teeth, and a cam disk 9c on the other side, having a single projection 9e which at every revolution of the gear 9 engages and swings a related member 11 which is hung on a shaft 8c in frame 8. Each gear 9 with its pinion 9b and cam disk 9c constitutes a practically integral unit (Figs. 15 and 16) and turns as such.

To prevent overrunning of the gear 9 a detent 9d pivoted on the shaft 8c engages the teeth of the pinion 9b and the detent is held in engagement with the pinion by a spring pressed ball detent 9i in a bore 8f in the frame 8. A similar spring actuated ball detent 11i engages a notch 11b in member 11 to hold said lever in position shown in Fig. 14, or engages a notch 11c in lever 11 to hold it in the position shown in Fig. 13.

Adjacent each gear 9 is a toothed bar 10 which is pivotally hung at 11a on member 11 and can move lengthwise (to the right Figs. 13, 14) when the member is rocked by the cam tooth 9e of its related gear 9. Each bar 10 is guided in a slot 8d in frame 8 and is permitted a limited amount of rocking movement on its pivot 11a. The outer end of bar 10 is held normally against the bottom of its guiding slot 8d by a spring 10s (connected to the end of bar 10 and a rod 8e in frame 8) Figs. 13 and 14.

Each bar 10 has two teeth 10a cut on its end next the gear 9 designed to be engaged with the teeth of the related pinion 9b in one position of the bar (Fig. 14) but normally held out of engagement therewith (Fig. 13) by a spring 10s.

The bar 10 is provided with an inclined cam face 10b and a hook 10c on its inner end below teeth 10a.

In each counter frame 8 (or 8a) there are four detents 9d three of the cam members 11 and three bars 10. There is one detent 9d for and in engagement with each of the four gears 9b. The first cam 11 is placed to be engaged by the cam member 9c of the units gear 9; the second by the cam 9c of the tens gear 9 and the third by the cam 9c of the hundreds gear 9. The first bar 10 is pivoted on the lever adjacent the units gear 11 and engages the gear 9b of the tens gear 9; the second bar 10 is pivoted on the lever 11 of the tens gear and engages the gear 9b of the hundreds gear 9; the third bar 10 is pivoted on the lever 11 of the hundreds gear and engages the gear 9b of the thousands gear 9.

In the three spaces between the adjacent gear sectors 3 (Figs. 4, 10, and 11) are three sectors 12 each pivoted on the shaft 3a and capable of a limited amount of rotary movement about its axis 3a. Each sector 3 is provided with two studs 12a and 12b (Fig. 10) so placed as to respectively engage the hooked ends of the related bar 10 in each of the counter frames 8 and 8a, stud 12a engaging the bar 10 of the total counter T, and stud 12b engaging the bar 10 of the subtracting counter S.

Each sector 12 is operable at the proper time by means of a pin 12c on the sector engaging a cam slot 13b in a lever 13, pivotally mounted on a shaft 13a in the frame 2, and having a depending arm 13c carrying a pin 13d engaging a notch 16b in a slide 16t which is arranged parallel with and beside the slides 16a and 16d in the meter, and projects out of the meter for engagement with actuating devices, hereinafter referred to, by which the slide 16t is shifted at the proper

times to move the sectors 12 as hereinafter described.

Each gear 9 is so arranged with respect to the related counter gear which it operates, that the projection 9c on its cams 9c will rock the related member 11 when the figures on the wheels are passing from 0 to 9 in the case of the balance counter T (or passing from 9 to 0 in the case of the subtracting counter S). When member 11 is so rocked the bar 10 pivoted thereon will be moved to the right (Figs. 10, 13, 14) the space of one tooth interval of the pinion 9b and it will be held in this position by the detent 11i engaging notch 11b (Fig. 14).

After the frames 8 and 8a have been raised to their upper position the related sector 12 is rocked and the stud 12a (or 12b) coming into contact with the incline 10b on the related bar 10 will raise the bar 10 until its rack teeth 10a mesh with the related pinion 9b, and then the stud 12a (12b) further advancing contacts with the hook 10c and pulls the bar 10 to the left (Fig. 13) and as its teeth 10a are then in mesh with the pinion 9b it will turn said pinion and cause its related gear 9 to advance the related numeral wheel one interval or number. In order that the transfer from a lower numeral wheel to the next higher numeral wheel may be completed before the next transfer is begun, the adjacent sectors 12 are operated or advanced in progressive order beginning with that for the lowest order, or the one between the units and tens columns. From the fourth numeral wheel on the counters are of the ordinary consecutive type, the transferring being done by means of Geneva gears or other suitable devices.

The means for manually setting the figure wheels of the subtracting counter and the method of locking it at zero are well known and consequently need no further description herein.

The couplings between the several moving parts of the meter and their actuators in the stationary unit, are made through the series of slidable bars or plates 16, 16a, 16d and 16t all of which are similar in design, each being slidable in respective grooves provided in the bottom plate 1e of the meter and each projects through the back wall 1b of the meter (Figs. 4, 22, 51) so that they will be coupled to their related actuators in the casing when the meter is in place.

On the front and back walls 1a and 1b of the meter are longitudinal ribs 1h (Figs. 2, 3, 4, 8) which are adapted to enter corresponding grooves in the stationary walls of the parts 100m and 100p for the purpose of properly locating and supporting the meter in position in the machine, and when the meter is in proper position it is locked in position by means hereinafter described.

Postmarking die and several numbering devices

Secured to the bottom frame of the meter to the left of the stamping die 5 is a postmarking die 21 (Figs. 5, 17 and 18) engraved with the name of the post office and state, and provided with removable dating units. Also secured to the bottom of the meter between the dies 5 and 21 is a consecutive serial number printing device 22 (Figs. 5, 18–20). The lowermost printing type on the wheels of the serial numbering devices 22 and the printing face of the postmarking die 21 are in the same plane as the printing surface of die 5 when in its upper position, so that each impression taken will show the stamp indicia of a predetermined value, a serial number, and a postmark.

The serial number printing device has a slotted operating arm 22a (Figs. 20, 21) projecting from its side next the value printing die 5; and a stud 5c projecting from one of the side members 5a (Figs. 18, 19) engages the slot in the arm 22a and oscillates the arm, (and consequently operates the serial number 22) upon and by the up and down movements of the die 5. The serial number counter 22 is of a well known construction which contains a duplicating attachment that makes it necessary to reciprocate the arm 22a twice in order to shift the counter one unit. As will be hereinafter explained the die 5 is raised and lowered twice during each cycle of operations of the machine therefore the serial counter 22 will be advanced one unit during such cycle and the imprints therefrom will be numbers in consecutive order.

Key controlled set up devices

When the meter is in operative position in the machine it comes under the control of key controlled set up mechanism, housed in part 100 of the casing, whereby the several slides 16, 16a, 16d, and 16t, which set and control the meter mechanisms hereinbefore described, are operated. In this part 100 is also housed the main shaft 103 of the machine. In the construction shown the shaft 103 is adapted to be manually operated and to make one revolution for each cycle of operations of the machine, and said shaft carries the various cams from which motion is imparted through proper connections to the various slides in the meter, and to the impression devices, and to the inking mechanisms; the impression devices and inking mechanisms being exterior to the meter.

As above stated each numeral printing wheel 4 can be shifted to bring any desired type to printing position by adjusting the slide 16 (Fig. 8) and the extent of adjustment of the slide 16 is determined by the series of depressible keys 107a in the corresponding row of keys projecting from the casing 100 (Fig. 1). The keys in the first row controlling the units wheel 4, the keys in the second row controlling the tens wheel 4, and the keys in the third row controlling the hundreds wheel 4, etc. As each wheel is controlled and operated alike by the set up devices, operated from its related row of keys, the operation of the devices for setting up one of the wheels 4 will explain the others.

Referring to Figs. 22 to 29: The main shaft 103 is mounted in suitable bearings in the casing and above the shaft 103 is also journaled a shaft 105. On shaft 103 is a cam 103a, Fig. 23, which is engaged by a double armed lever 103b pivotally mounted on a stud 103c attached to the intermediate frame 100c and said lever 103b having an upwardly extending arm 103d provided with a slot 103e to engage a pin or roller 105b on an arm 105a fixed to shaft 105, so that for each rotation of shaft 103 shaft 105 will be rocked back and forth. The contour of the cam 103a is such that one revolution of shaft 103 will cause shaft 105 to rock but once, forward and back through approximately 90 degrees.

Secured to rock shaft 105 is a sector 112 (one for each column of figures) which is rocked through a definite angular distance at every operation of the machine. Adjacent each sector 112 and loosely mounted on shaft 105 is a gear segment 113 having an upwardly projecting arm 113a to which is pivoted a catch 114, having a tooth 114b which normally engages a notch 112a

in the sector 112, and would cause the segment 113 to move with sector 112 when the latter is oscillated. The catch has a pin 114a attached above the tooth which normally prevents the disengagement of the tooth from the sector. The extent of movement of the segment 113 with the sector 112 is limited by the depression of a key in the related row of keys as hereinafter explained.

The segment 113 meshes with a pinion 127a on a transverse shaft 127 mounted in the frame parallel with and above the shaft 105 there being a shaft 127 for each row of controlling keys and a description of one will explain all. On this shaft 127 is also fixed a gear 127b, Figs. 24 and 26, which meshes with a segment 126 loosely mounted on the shaft 105 and has teeth corresponding with those of sector 113; and as pinions 127a and 127b are alike, motion imparted to shaft 127 by movement of segment 113 will cause the sector 126 to move the same extent as the segment 113.

The sector 126 has a radial arm 126a having a pin 126b which engages a slot 128c in a coupling member 128 which is slidably mounted below the shaft 105, see Figs. 22 and 26, and this coupling member has a tooth 128d on one end which engages a notch 16n in the slide 16 that operates the gear sector 3 in the meter, see Fig. 8, which gear sector operates the numeral wheel in the counters corresponding to the denomination of the row of keys to which the particular segment 113 is related.

Each segment 113 and sector 126 represent a column of figures in the related numeral wheel and in the related key row to be printed accordingly.

Each coupling member 128 has a rear slot 128a in its rear end slidably engaged with a rod 129 and positioned relative thereto by a guide 129a Fig. 26 fixed on the rod. Member 128 also has a slot 128b in its forward end slidably engaged with a rod 130 and positioned thereon by guides 130a, fixed on said rod. The rod 130 is supported in crank arms 130c attached to a rock shaft 130b, Figs. 22, 26 and 27. The rod 130 supporting the slidable couplers 128 has a limited amount of vertical displacement, and is provided in order to enable the connection between the coupling member 128 and their related slides 16 to be broken (as indicated in dotted lines in Fig. 26) so that the coupling members will not be injured during the placing or removal of the meter. On the outer end of the rock shaft is an arm 130e (Figs. 49, 50) connected by a link 130d with an arm 123c of the hand lever 123. By moving hand lever 123 shaft 130 can be rocked and the connections are such that when lever 123 is pressed down to permit the removal of the meter, the rod 130 will also be in its lower position, and the ends 128d of couplers 128 will be below the point where they could possibly interfere with the sliding in or out of the meter.

Other couplers (like 128) are provided to engage slides 16t, 16d and 16a and are grouped with couplers 128 in alignment with their related slides. The several couplers are mounted on the supports 129 and 130 and all simultaneously raised or lowered by the operation of the lever 123.

The slides 16, 16a, 16d, and 16t are not reciprocated in unison but each is operated in timed relation to the complete cycle of operations of the machine, and timely motion is imparted to the respective couplers 16a, 16d, and 16t by similar cams 131 (Fig. 27) secured to the main shaft 103. The followers 131a for the respective coupler cams 131 are all pivoted on the fixed shaft 131d and have upwardly extending arms 131b provided with studs 131c which engage slots 128e in their related couplers 128, and impart reciprocatory movement thereto at the proper times.

The several groups of cams 131 and couplers 128 are graphically represented (one group only being shown) in Fig. 27, the contours of the cams being varied to suit the timing and movement required to control the movements of the printing die, the counter engagement, and the transfer devices in the meter, as previously described.

As above stated the extent of movement of the sectors 113 (and the consequent value set up of the printing wheels and corresponding members are added in the total counter T and subtracted in the subtracting counter S) is controlled by the keys 107 which are adapted to limit the movement of the segments 13 with and by the sectors 112. The key controlled mechanism for limiting the extent of movement of the segments 113 is illustrated in Figs. 22, 23, 25, 28, and 29.

Above the shaft 105 is a series of curved key holders 106 (Figs. 22–29) one for each row of keys Each holder has radial slots 106a to guide the stems 107 of keys 107a, and pockets 106b for the key lifting springs 107s (Fig. 29). In the holder are two endwise movable arcuate plates 109 and 110. The plate 108 holds the springs 107a in place in the pockets 106b and prevents them interfering with the free action of the cam plate 110. Radial slots in the holder and cam plate adjacent each key permits movement of the cross pin 107b with the stem. A cover plate 111, fastened to the side of the holder retains the whole assembly together.

Each stem 107 has on its outer end a head 107a marked with its identification number, and carries a cross pin 107b which engages its related spring 107s; it also has projection 107c which limits its inward movement and its inner end is hooked as at 107d.

The arcuate plate 110 is free to move lengthwise a limited distance in the holder. The convex or outer edge of plate 110 extends beneath the pins 107b and is provided with slots 110a (Fig. 28) to permit entry of the pin 107b of the key that is first depressed. These slots 110a are at an angle to the radius of the plate so that the pin 107b of the key depressed will cause plate 110 to move endwise and displace the slots 110a with relation to the pins 107b of the other keys, and make it impossible to depress any other key when one of them is down.

Plate 109 is also free to move endwise in the holder, but is normally held in the position shown in Fig. 23 by a retractile spring 109s. This plate has a series of catches 109a Fig. 28, one for each key on its convex or outer edge. A spring 109s connected to the upper end of plate 109 causes the inclined upper edge 109b of each catch to bear against the cross pin 107b of its related key. When any key is depressed its cross pin 107b engages the incline 109b of the adjacent catch 109a and causes the plate 109 to move endwise until the pin passes below the incline whereupon plate 109 which will then, under the influence of its spring 109s be returned to its original position, and the hook of the latch passing over the pin of the depressed key will hold the key down. By means of plates 109 and 110 when any key is depressed it will be locked "down", and all other

keys in the same row will be locked in "up" position.

The cover plate 111 is fastened to the plane side of the keyboard sector 106 one of its functions being to hold the assembled parts in place. Its principal function however is to act in conjunction with the several keys in making the selection of values possible by arresting the registering mechanism at selected points in the cycle of operation. It is of the same general shape as key holder 106 but its projecting inner or concave edge is provided with indentations or slots 111a (Figs. 23 and 25) in line with the key stem 107. The inner ends of the key stems when in the "up" position coincide with the inner edge of the plate 111 and bridge the related slot 111a (Fig. 25) so that the inner edge of plate 111 and lower edges of the inner ends 107d of the keys will present an unbroken curved surface to a piece moving along the inner edge of said plate.

The order of the value keys 107a is as indicated, with 1 at the top and 9 at the bottom (the uppermost key 107e in each row is a correction key and will be explained later).

When the machine is at rest (between successive cycles of operations) the positions of the gear segments 113 and sector 112 are as shown in full lines in Fig. 23. At the beginning of a cycle of operations the first movement of the carrier is in the direction of the arrow (Fig. 23) and if not obstructed the gear segment 113 will be moved the full travel of the sector 112; but the depression of any key in the related row will cause the hooked end 107d of its stem to project below the plate 111 and open the related slot 111a and the hook end 107d of the depressed key stem will engage the pin 114a of the catch 114 (Fig. 25) and deflect it upward into the notch 11a and disengage tooth 114b from the notch 112a in the sector 112. The movement of the gear segment 113 is thus arrested at the point corresponding to the position of the depressed key, but as sector 112 continues its movement its upper edge passes under the tooth 114b and holds catch 114 in its raised position. On the reverse travel of the carrier the projecting lug 112b on the upper edge of sector 112 will engage the catch 114 and move pin 114a out of the notch 111a and reengage tooth 114b with the notch 112a in the sector which will then move segment 113 back to normal position (Fig. 23).

When the sector 112 is in normal position the related segment 113 is in the zero position and if no key is depressed it will be necessary to prevent any travel of such segment. This is accomplished by a "zero" stop comprising a three armed lever 115 (see Figs. 22, 23, 24, and 25) pivoted at 115a to the related key holder 106. The upper arm 115b of lever 115 has an elongated notch the ends of which are adapted to engage a stud 110b made fast to an extension of the key holder plate 110. Lever 115 is held in the normal position shown in full lines (Figs. 22 and 23) by a spring 115s attached to an arm 115e of lever 115 and to a stud on the key holder. When in this normal position the lower right arm 115d of lever 115 lies in the path of a lug 114c on the catch 114 (Fig. 23) and in such position when the sector 112 begins to move, lug 114c will cause catch 114 to swing and move pin 114a into the slot 111b of plate 111, which is the "zero" position; and the tooth 114b becoming disengaged from the slot 112a will be held up by the upper edge of the sector moving under it and thus prevent movement of segment 113. If however a related key stem has been depressed, the sector plate 110 will be moved inward by the cross pin 107b of the depressed key, and its stud 110b will have rocked the zero stop 115 so that its arm 115d no longer interferes with the catch 114, while its arm 115e will have closed the entrance to the "zero" slot 111b. Thus catch 114 will be free to travel with the carrier until it is arrested by the stem of the depressed key as above explained.

At the end of a cycle of operations the depressed keys are released by a lever 116 (Figs. 22, 24, 25) pivoted on stud 115a, the lower arm 116a of lever 116 being tripped by a pin 112c on the sector 112 near the end of its backward stroke. The tripping of the lower arm 116a of lever 116 causes its upper arm 116b to move the plate 109 to the left thus withdrawing catch 109a that holds the key down. When the catch is thus moved out of the way the spring 107s of the depressed key pushes it upward, and its cross pin 107b engaging an inclined slot 110a in plate 110 restores said plate to its normal position.

The tenth or uppermost key 107e is a correction key. Its stem differs from the stems of the other keys in that it has no hooked end. When key 107e is depressed its only function is to move the plate 109 and cause it to release any key previously depressed in its row. The plate 109 under key 107e has no catch 109a and hence the correction key will not be held down.

The impression devices

The dies may be inked and an impression made by means hereinafter described, or by other suitable means as will be obvious to those familiar with the art.

In the machine shown I have provided means for feeding a strip of paper to the printing point to receive an impression, and also means for feeding an endless tape past the printing point to receive a record impression of the value of each stamp printed; and a reciprocatory platen for taking impressions on the strip and a rocking roller carried by these platens for taking impressions upon the tape; also a reciprocatory inking mechanism for inking the dies and printing surfaces once for each cycle of operations of the machine. The mechanism for operating the platen is shown clearly in Figs. 22, 30, and 31.

Beneath the printing dies is a reciprocable platen 206 which is preferably provided on its upper surface with resilient pad 207. This platen is provided with depending arms 206b, 206c and 206d, through which passes a rod 208 which rod is pivotally connected to the upper members 209 of toggles the lower members 209a of which are pivotally mounted on a shaft 208a supported in brackets 208b on the base. Toggle members 209a are connected by links 210d Figs. 30, 31 to arms 210c on a cross shaft 210b mounted in the frames 100b, 100c, and an arm 210a on this shaft carries a roller 210e engaging a cam 210 on main shaft 103 (Figs. 30, 31). By this means the toggles are alternately strained to raise the platen to impression position, and broken to lower it. The vertical reciprocation of the platen is utilized to take impressions from all the printing surfaces (5, 21, 22) upon a strip W which is fed into position between the dies and platen by means hereinafter described, and after the printed portion is then severed by means hereinafter described and can be applied as an ordinary stamp to mail matter where the machine is used for printing postage indicia.

In the present invention the platen is also uti-

lized as a carrier for an impression roller 207a by means of which a record impression of the value of the stamp determined by the value wheels 4 at each operation of the machine. Such record strip being fed from a roll and rewound as hereinafter described. For this purpose two of the brackets 206c and 206d are extended to the left of the platen proper, (Figs. 30, 31) and support an impression roller 207a preferably of rubber, the extreme periphery of which is at the same distance from the center of shaft 208 as is the center line of the upper surface of pad 207.

In order to rock the platen 206 at the proper time and in such manner as to cause the impression roller 207a to cooperate with the numeral type on the arms of wheels 4 entered in the die 5, the shaft 208 is connected by links 208c to a rock shaft 211 journaled in the frames 100b and 100c, and the brackets 206b and 206d are connected by a link 208d to arms 211b fast on shaft 211. On this shaft 211 is another arm 211a (Figs. 30—31) connected by a link 212b to a cam lever 212a pivoted on a cross shaft 131d and carrying rollers engaging a cam 212 on the main shaft 103. When the parts are in the position shown in Fig. 31 the links 208c and 208d would cause the platen 206 to raise and lower vertically to or from the die 5 when the toggle is strained, and then return it to the lowered position when the toggle is again broken. During this time the shaft 211 should not be rocked. But after the platen has taken impression from the strip the cam 212 rocks the shaft 211 as indicated in dotted lines in Fig. 31 and this causes the platen 206 to rock from left to right and in so doing to move the roller 207a into contact with the type on the arms of the wheels 4 within the die 5 and take an impression therefrom upon the tape w.

It is the purpose of the printing mechanism to obtain two separate imprints one on strip W and one on tape w at each operation of the machine. The first imprint on the strip is taken from the entire set up of the dies; and is the required indicia for attaching to parcels to be mailed. The second imprint on tape w preferably only includes the value and the consecutive number of the stamp just printed; and being taken from the same "set up" of the dies, is a positive check or tally on the output of the machine in printed postal indicia, but being only fragmentary part of the indicia is worthless for any other purpose.

To accomplish this double printing operation the platen 206 must first be raised and the pad 207 pressed firmly against the dies; it must then be lowered to clear them, and rocked to an extent that will place the roller 207a under the dies; finally it must be lowered and rocked back to its normal position. The printed stamp must then be ejected, a fresh portion of the strip W advanced over the platen 207 and the tally tape w advanced one interval.

The rocking motion of the shaft 211 is timed to take place when the platen 206 is in its downward positions, and clear from interference with the dies; and each position of shaft 211 is held steadily during the raising or lowering process, and as the pivotal points of the links 208c and 208d are fixed, the angular relation of the platen in its vertical motion will be preserved.

Normally the flat pad 207 of the platen 206 lies directly under the dies (Figs. 31 and 45). When links 210d are moved to straighten the toggle lever 209a, the platen is moved upward pressing the strip W against the dies and taking an imprint thereon, the maximum pressure occurring when the toggle levers are vertically disposed, as in dotted lines Fig. 31. The links 210d continuing their movement reversely break the toggles and the platen is drawn down with the toggle levers on the other side of the vertical (Fig. 31). At this time the shaft 211 is rocked by cam 212 and moves the links 208d causing them to rock the platen until the roller 207a lies beneath the dies. The links 210d then begin their return stroke and in so doing cause the toggles to again raise the platen and cause roller to take an imprint on the tally tape w. At the end of the return stroke of links 210d the shaft 211 has been rocked back to its original position leaving the platen in normal position ready for another operation.

The inking devices

The mechanism for inking the dies is contained in the housing 101, Figs. 22, 32, 33 and consists of a frame 200 carrying the ink supply tank and the feed rollers; and a slidable carriage 204 by means of which the form roller 204a applies the ink to the surface of the dies.

The frame 200 is preferably formed of sheet metal and has two lugs 200a, by which it is hung on a fixed rod 200b, and up-turned sides 200c between which are mounted the supply rollers 201, 201a and 201b (Fig. 22) and two upturned lugs 200d which are connected by springs 200s to the wall of the housing 101 to hold the frame 200 in contact with the adjusting screws 200e. The opposite sides of the frame are turned downward and inward forming the two channels 200f.

The rollers 201, 201a and 201b are mounted between plates 201c secured to the sides (Fig. 21) 200c. The roller 201 dips into the ink contained in a tank 201d secured to the frame 200; the roller 201a is preferably of felt, and the third roller 201b is mounted beyond the supply tank and contacts with the form roller 204a. The two rollers 201 and 201b revolve in fixed bearings in the frames 201c but the shaft of roller 201a projects through elongated slots in the frames 201c and are engaged by springs (Fig. 22) which hold roller 201a in firm contact with the rollers 201 and 201b.

The rollers 201 and 201b are driven by means of a train of spur gears 202a and 202d (Figs. 32—33) gear 202a being driven by miter gears 202e from vertical shaft 202 which in turn is driven by miter gears 202f from a horizontal shaft 203 which is in turn driven by a worm gear 203a thereon meshing with a helical gear 203b on the main shaft 103.

The carriage 204 is formed of sheet metal with upturned side flanges 204b (Fig. 32) the forwardly projecting ends of which are provided with notches which receive the shaft of the form roller 204a. The upper ends of flanges 204b are bent outward to form ribs 204d (Fig. 32). Anti-friction rollers 204e held in position by retainers 204f are arranged one above and one below the ribs 204d, and the rollers are confined within the upper and lower walls of the channels 200f; the carriage is guided and supported by the channels 200f, and can be moved forward and back with a minimum amount of friction. The carriage 204 is reciprocated by a lever 205 pivoted at 205a (Fig. 22) and having a notch 205b in its free end engaging a roller 204h on a lug 204g on the carriage. Lever 205 is connected by link

205c (Fig. 22) to the follower 205e of a cam 205d on the main shaft 103 which cam is timed to cause follower 205e to move lever 205 and advance the form inking roller 204a, immediately after the value selection has been made and the die 5 raised to printing position to ink the faces of the dies 5, 21, and 22.

In its retracted position the ink roller 204a contacts with the revolving metal roller 201b from which it gets its supply of ink. The screws 200e are used to regulate the pressure of the roller 204a against the dies.

Means for feeding the strip W

In the machine shown the value stamp indicia is printed upon a paper strip W which is preferably coated with gum on the under side, and is supplied from a roll 300 (Figs. 1 and 34) mounted on a stud 300a on the front wall of the machine below the keyboard, retaining plates 300b, being provided to hold the roll. The end of the strip, gummed side down, is led through a guide 300c to and between feed rollers 301, and 301a to and between the members of a cutter 302 and thence over the impression pad 207 of the platen 206 (Figs. 47 and 48) upon which it is located by the side guides 207b, until the end of the strip lies over the idler roller 207c at the end of the platen (Figs. 34, 38, and 39).

The lower feed roller 301 is mounted in a bracket 301b (Figs. 34 and 35) and on the front end of its shaft 301c is a coupling 301e by which it is connected to its driving mechanism. The shaft 301d of the upper feed roller 301a is guided in elongated slots in the sides of the bracket 301b (Fig. 35) and its projecting ends are engaged by springs 301s which hold it in contact with the roller 301. Spacing collars 301f and 301g position the rollers in the bracket. The feed rollers are intermittently operated, and only at a time near the end of a cycle of operations to feed a proper length of strip W on to the platen to replace the previously printed length which has been severed and ejected as hereinafter described. The rollers can be driven as follows:

The shaft of roll 301, (Fig. 35) is connected by a coupling member 301e to a coupling member 305b on a stub shaft 305 journaled in a bracket 305a attached to the frame 100c. On shaft 305 is pinned the disk 304b which is engaged by the driving member 304d of a clutch 304 rotatably mounted on shaft 305 and having a gear 304a meshing with pinion 303e on a shaft 303 which is journaled in the bearing 303a adjacent bracket 305 and in a bracket 303b adjacent the main shaft 103 and shaft 303 has a worm 303d meshing with a helical gear 303c on shaft 103 whereby shaft 303 is continuously driven.

The clutch 304 is positive in action and is preferably of the roller type. As this type of clutch is not novel a general description of its operation will be sufficient. The driven member 304b is provided with a projecting lug 304c (Figs. 36 and 37) and a rotatable member 304d between the driven and driving members, has a similar lug 304e. Normally both of these lugs are held against a stop arm 306c on a rock shaft 306 by means of a back stop pawl 304f mounted on a support 305x attached to bracket 305a, and actuated by spring 304s. When the lugs are so held the clutch remains inactive, but if the stop arm 306c is rocked out of contact with the lugs 304c and 304e, the movable member 304 will spring forward throwing the clutch into action and causing the shaft 305 to revolve.

The shaft 306 (see Fig. 35) is mounted in bearings in brackets 306a on frame 100c and carries on its end adjacent the clutch member 304b and 304c the stop arm 306c which is adapted to engage lugs 304a and 304c and stop the rotation of the shaft 305 after each complete revolution thereof. On the other end of shaft 306 is an arm 306b (Figs. 35 and 36) which has a down-turned outer end provided with a beveled face 306d which is adapted to contact with a roller 307d on an arm 307 of a three armed lever pivoted at 307x on frame 100c. This lever has a short arm 307b connected by a spring 306s to the free end of the arm 306b and holds the incline 306d in engagement with the roller 307d. Said lever also has an arm 307a carrying a roller 307e which engages a cam 307f fast on the shaft 103, see Fig. 35, and this cam is adapted to rock the compound lever 307b, 307c and through the pin 307d and arm 306 to rock shaft 306 in its bearings. The contour of cam 307 is such that the clutch stop arm 306c will be raised and immediately lowered after the passing of the clutch lugs 304c and 304e, limiting the activity of the clutch to but one revolution. The length of strip W fed by the rollers 301 and 301a at each operation is equal in length to the circumference of the driven roller 301 and length of the platen 206. After this strip is thus led, and preferably prior to printing thereon the strip is severed by a suitable cutter as hereinafter described.

The strip delivery devices

After the strip has been severed and printed and the platen is returned to normal position and just before the end of the operation the strip is delivered by operation of roughened, serrated or milled wheels 310f (Figs. 38 to 42) which are mounted upon a shaft 310e rotatably mounted in a swingable frame 310 adjacent the end of the platen 206 opposite the strip feed rollers 301 and 301a. The shaft 310e carries a pinion 313f meshing with a pinion 313e pivoted on one side of the frame 310 and pinion 313e meshes with pinion 313d rotatably mounted on the shaft 309a upon which the frame 310 is pivoted; shaft 309a being mounted in a stationary support or frame 309 mounted on base 100a. Pinion 313d meshes with a gear 313c journaled on a stud 309f on frame 309 and gear 313c meshes with a gear 313b loosely mounted on a stud shaft 309e in frame 309. Attached to pinion 313b is a smaller pinion 313a which meshes with a gear 313 fast on shaft 203 which drives the inking rolls and which shaft is operated at the proper time to cause rotation of the ejector wheel 310f. When frame 310 is swung toward the platen as hereinafter described, the ejector wheel 310f pinch the severed and printed portion of the strip against roller 207c on the end of the platen (Fig. 41) and eject it.

The frame 310 is normally in the position shown in full lines, Figs. 38 and 42, and is normally held in this position by spring 311s which is attached to the frame 309 at 309c and its other end is attached to a cam plate 311, pivoted on the shaft 309a beside one member of frame 310. This cam plate has a finger 311a adapted to engage a lug 310b on frame 310 and swing frame 310 anticlockwise to the position indicated in Figs. 38 and 42. The finger 311a is connected to a lug 310a of the frame 310 by a spring 310s which is weaker than spring 311s, but when cam plate 311 is moved back to the position shown in full lines in Figs. 39 and 41, the frame 310 is moved clockwise so

as to cause the ejector wheels **310***f* to engage the strip of severed and printed paper on the platen and eject the same. The cam plate **311** has a cam surface **311***c* which is adapted to engage a pin or roller **312***f* on a disk **312***d* rotatably mounted on shaft **203**, and this disk is attached to a pinion **312***c* (Figs. 38–40) which meshes with a gear **312***b* on a stud **309***d* on frame **309**. A larger gear **312***a* is attached to gear **312***b* and meshes with a pinion **312** attached to but smaller than gear **312***c*. The cam plate **311** is normally held in the position shown in Figs. 38 and 40 but at the proper time pin **312***f* engages the cam plate and rocks it to the position shown in full lines in Figs. 39 and 41 bringing ejector wheels **310** into operative relation with roller **207***c*.

The train of gears **312** to **312***c* is introduced to reduce the speed of the disk **312***d* to one revolution per operation of the machine; the shaft **203** which drives the inking rolls having a somewhat higher speed, so that at every revolution of the disk **312***d* roller **312***f* will engage the arm **311***c* of the cam plate **311** and cause it, and the frame **310**, to be rocked clockwise or in the direction of the platen **206**.

When the frame **310** is rocked toward the platen **206** the ejector wheels **310***f* which are revolving, are brought into contact with the strip of paper tape which has been printed and whose end lies over the idler roller **207***c*, at the end of the platen pad **207**. The ejector wheels are made with sharp pointed teeth which take a firm grip on the paper and the force of the grip is limited by the tension of the spring **310***s* which is made sufficiently strong to forcibly eject the strip but not strong enough to mutilate it. After passing the ejector wheels the strip passes through an aperture **314** in the casing of the machine (Fig. 2) but is prevented from flying away with any stray currents of air by a very light flat spring or tongue of metal **314***s* which permits the end to protrude through the opening **314** where it may be removed by hand.

After a proper length of strip W is fed over the platen and between the rolls **301***a* and **301***c* it is severed by any suitable cutting mechanism.

The strip cutting devices

Preferably I employ a rotary cutting device such as shown in Figs. 34, 43, and 44. This consists of a fixed screw **302** and a rotatable nut **302***a* both of which are cut away as indicated. The screw or threaded rod **302** is secured in a bracket **302***b* which is fastened to the side walls of the box casting **101**. The nut **302***a* is rotatively mounted upon the screw **302** and has on its free end an arm **302***c* (Fig. 34) which is connected by a link **302***d* with an arm **302***e* pivoted on the adjacent wall of the casing and adapted to be engaged by a pin **208***b* on a gear **308** which is mounted on a stud **308***a* below the arm **302***e* (Fig. 34) said gear meshing with a gear **303***f* secured on the shaft **303** (Fig. 35). At each revolution of the gear **308** the pin **208***b* engages the end of the arm **302***e* and swings it to the left (Fig. 34) and causes the nut **302***a* to rotate a sufficient distance to cut and sever the paper from the supply roll. The arm **302***e* is returned to normal position by a spring **302***s* attached to the end of link **302***d* and the wall of the casing, said spring holds the arm **302***e* normally against a stop pin **302***f*. The strip W which is passed between them the screw and nut when in the position shown in Fig. 44, is severed by rotating the nut **302***a*. This cutting action is timed to occur before the platen **206** is raised for the printing operation. The severed portion of the strip remains on the platen and is held in position thereon by the guides **207***b*, and is rocked back and forth with the platen during the printing operation on the tape, and ejected as above described when the platen finally comes to rest in its normal position after the printing operation on the tape.

The record type printing feed devices

A record of the value of each stamp printed is also preferably impressed upon a record tape *w* following the printing of the stamp indicia upon the strip W and before the strip is discharged from the platen as hereinbefore described. The record web is preferably fed from a supply roll **316** to the printing point and thence back to a reel **318**, whereon it is rolled up, to be available in convenient form when required.

The roll **316** is mounted on a sleeve **316***b* on a stud **316***a* attached to the outer face of the part **100***b* of the framing at the side of the machine below the inking mechanism and in front of the platen **206**. This sleeve has a lug **316***c* adapted to engage the spool upon which the tape is wound so as to prevent its rotating upon the sleeve. The sleeve may be frictionally engaged with the stud **316***a* by means of a spring **316***s* interposed between the head of a screw **316***e* tapped into the stud and a recess in the outer end of the sleeve as indicated in Fig. 46.

From the roll **316** the tape *w* is led over a guide **316***f* to and between guide plates **315***c* and **315***d* which are attached to laterally depending ends of links **208***c* (see Figs. 47 and 48) adjacent the shaft **208**, a roller **315** being mounted upon the shaft **208** and a smaller roller **315***b* being mounted on a rod **315***a* supported between the ends **208***e* of the link **208***c*. The plate **315***d* is curved concentric to roller **315***b* and the plate **315***c* extends beyond the lower end of the plate **315***d*, and its upper end extends upwardly to and slightly above the axis of the roller **315** (see Figs. 47 and 48) so that the tape *w* would be guided between the plates **315***c* and **315***d* to the roller **315**. Between the roller **315** and roller **207***a* is a short guide plate **315***e* and opposite this plate and cooperating therewith is a guide plate **315***f*, these plates being connected together at the sides and the plate **315***f* being attached to the brackets supporting the platen **206**. The lower edge of plate **315***f* is curved and overlaps the curved upper edge of plate **315***d* as shown so that the tape will be directed between plates **315***e* and **315***f* from roller **315** to roller **207***a*. Thence the tape passes from roller **207***a* backwardly to and around the roller **315***b* and between this roller and plate **315***d* and then led backward over a roller or guide **316***e* on frame **101***b* above guide **316***f* and thence under guide **316***g* to a rewinding roll **318** to which the end of the tape *w* is attached. Roller **318***f* is attached to a shaft **317** by which it is operated to advance the tape at each operation of the machine as hereinafter explained.

The construction is such that after the platen **206** has been raised to make an impression from the dies by the straining of the toggles **209** and **209***a* through action of links **210***d* the shaft **211** is rocked so as to move links **208***d* and cause the platen to swing over to the right carrying the roller **207***a* upward into contact with the type

on wheels 4a in the die 5 (see Figs. 31, 45, and 48). Sufficient ink remains on the type to enable the second impression to be taken therefrom upon the web w pressed against the type on arms 4a by the roller 207a. Then the toggles are broken and the parts returned to the position shown in full lines in Figs. 31–45 and 47 at which time the rewinding roll 318 is turned so as to advance the tape to bring an unprinted portion of the tape into position to have an impression made thereon in the next cycle of operations of the machine.

In the construction shown a sleeve 318 (Figs. 45–46) is removably mounted on the end of the shaft 317 and the end of the tape can be detachably secured to sleeve 318 by a staple 318c the outer member of which engages a groove 318b in the sleeve 318 and the inner end of which engages a bore 318a and the end of the shaft 317. In attaching the web its end is wound around the sleeve and over the groove 318b, and the long leg of the staple presses the tape into the groove, and the short leg of the staple is entered into the hole 318a. The sleeve is then revolved a few turns and the tape is securely held. To remove the rewound roll of tape from the sleeve it is only necessary to grasp the roll of tape and give it a twist on the sleeve in the reverse direction to loosen up the inside coils and then the staple can be removed to free the roll.

Secured to shaft 317 is a wheel 317a having ratchet teeth of very fine pitch cut on its circumference. A swingable arm 317b is provided on shaft 317 adjacent wheel 317a and a pawl 317c which engages the ratchet teeth and turns the wheel 317a in one direction only, a retaining pawl 317d mounted on wall 101b preventing reverse turning of the wheel. A rocker arm 319 is pivoted on a stud 319a on wall 101b and is rocked in unison with the oscillating arm 205 (which operates the inking mechanism) (Fig. 22) by means of a connecting link 319b. A link 320 pivoted at 320a to the rocker arm 319 is provided with a stud 320b which passes through an arcuate slot 317e in the arm 317b and through an opening 101d in the wall 101b and is provided with a roller 320c. A spring 320s connected to the link 320 and a stud on wall 101b holds roller 320c in contact with the sleeve 318 or with the tape reeled upon it.

The stud 320b passing through the slot 317e of the arm 317b causes the arm to oscillate with the rocker arm 319 and this revolves the sleeve 318 and rewinds the tape T upon it. As the diameter of the roll increases the roller 320c resting upon it will move the stud 320b further from the center of the wheel 317a along the arcuate slot 317c and the angular distance through which the arm 317b travels will therefore decrease as the diameter of the roll increases and the linear distance through which the tape is moved at each operation will be approximately equal, regardless of the diameter of the roll of rewound tape roll.

Stop for main shaft crank

In order to ensure that at the end of a cycle of operations all of the working parts of the machine will be in their proper normal positions and ready to properly function, a removable stop pin 117 operated from the keyboard has been introduced. This pin 117 (Figs. 2, 49, 50, and 50a) which normally projects from the right hand wall of the machine into the path of the crank 104d but which is retracted into the body of the machine upon the pressing down of any one of the value keys in any column, and held in retracted position until, near the completion of the second turn of the crank, all the depressed keys are released and the stop pin 117 again projected.

A rock shaft 118 is mounted in frames 100d and 100c adjacent the rear upper end of the key holder, and has an arm 118a (Figs. 50 and 50a) whose free end rests upon the offset end 115f of the lower arm 115d of the zero stop lever 115 (Figs. 23, 24, and 25). A spring 118s attached to an arm 118b on shaft 118 and to frame 100d holds arms 118a normally against the zero stop 115 (Fig. 50). As above explained the depression of any key 107 will cause stop lever 115 to rock on its pivot and raise its lower arm 115d, and as arm 118a rests upon lug 115f of arm 115d it will be raised thereby and rock shaft 118. The arm 118b is connected by a link 118c to one arm of a bell crank 117a (Fig. 49) pivoted at 117b to a stud 117c on frame 100d, the other arm of such bell crank being pivotally connected to the slidable pin 117. There is an arm 118a provided for the zero stop 115 of each key holder, and rocking of any one of them will cause rocking of shaft 118. By rocking the shaft 118 bell crank 117a will be rocked and cause the slidable pin 117 to be alternately projected into and withdrawn out of the path of the hand operated crank 104d.

Safety locking devices

In the actual postage machine as approved by the Government of this general type, protective devices are required in order to insure reliable operation of the machine and prevent obtaining of impressions from the dies or actuation of the counters in a fraudulent manner. And I have provided (1) means for insuring the proper positioning of the meter in the machine and locking it in such position during its operation; (2) means to render the meter mechanism inoperative when the prepaid amount of postage in the meter becomes exhausted; (3) means for locking the subtracting counter when the amount of prepaid postage becomes exhausted; (4) means for locking the machine when the meter is removed; (5) means for locking the key sectors when the meter is removed so that the keys may not be operated; and (6) means for locking the slides which actuate the sectors, and will explain these in their order.

Meter positioning lock

The lock 17 projecting from the upper right hand corner of the meter, is a commercial lock of the well known pin tumbler design (Figs. 5, 51, and 55). The cylinder of the lock is coupled to the shaft 18 in the meter (Fig. 51) and turning the cylinder lock by means of a key will cause shaft 18 to turn. The key 120 (Figs. 55, 56, and 59) for operating the lock 17 is operated by mechanism hereinafter described. On shaft 18 is secured an arm 18a (Figs. 51 and 52) which operates a link 18d connected to one end of a rocking lever 18c the other end of which is connected by a link 18e to bolt 18b that can be projected through a hole in the floor of the meter and engage a hole 18h in the top wall 100w of the part 100m of the casing, and insure the correct location of the meter, and lock the meter in place.

When the meter is slid into place the lock 17 enters a hole 121d in the wall of the casing 100c (Figs. 55 and 56) and a key 120 enters the keyhole of the lock and said key can be turned by means of a manually operable lever 123 hereinafter explained.

Meter locking pin

One of the necessary features of the machine is means to render the meter mechanism inoperative when the prepaid amount of postage in the meter becomes exhausted. For this purpose a pin 119 (Figs. 49, 50, 50*a* and 54) is provided, and designed to enter a hole 20*e* in the wall 1*a* of the meter 1. A shutter 20*c* in the meter is arranged to bar the entrance of the pin upon the exhaustion of the prepaid amount set up on counter S. The pin 119 is slidably mounted in a suitable opening in the frame 100*c* at a point where it can enter the hole 20*e* of the meter when the latter is in operative position. Pin 119 is reciprocated by means of a bell crank 119*a* pivoted at 119*b* to a stud 119*c* on the frame 100*c* (Fig. 49) and connected by a link 118*e* to an arm 118*d* secured to a shaft 118. The rocking of shaft 118 caused by the pressing down of a value key (as hereinabove described) will cause the pin 119 to move outward and enter the hole 20*e* of the meter. But if outward travel of the pin 119 is prevented by the closing of hole 20*e* by shutter 20*c* the shaft 118 will also be prevented from rocking, and the keys 107 from being depressed and the stop pin 117 (also operated by shaft 118) cannot be withdrawn to release the crank 104*d*.

The shutter 20*c* is a sector shaped piece fastened to shaft 20 close to the right hand wall 1*d* of the meter. A hole 20*d* in the shutter is so located that in one of the positions of the shutter hole 20*d* registers with the hole 20*e*; but in its other position, the shutter will close the hole 20*e* and prevent the entry of pin 119 as hereinafter explained.

Subtracting register lock

Mounted on a pivot shaft 23*a* between the sides of the frame 6 of the subtracting counter is a lever 23 (Fig. 54) the forward arm of which is provided with upwardly projecting teeth 23*b*, one for each of the three highest numeral wheels 7 of the subtracting counter S, and each of these wheels is provided with a radial slot that will be in line with a tooth 23*b* when the zero appears at the sight opening as in Pitney's Reissue Patent No. 15,734 so that detailed description of such locking counter and wheels is not necessary but when all the three higher order numeral wheels reach zero, the lever 23 will be actuated by a spring 23*s* and turn on its pivot shaft 23*a* and cause the teeth 23*b* to enter the slots and lock the counter and in so doing the rear arm of the lever will be moved downward. The rear end of lever 23 has a pin 23*c* (Fig. 54) which engages a slot 20*b* in an arm 20*a* fast to shaft 20 and when the rear arm of lever 23 moves downward the stud 23*c* will carry with it the slotted arm 20*a* and causes the shaft 20 to rock and move shutter 20*c* to close hole 20*e* and prevent the projection of the meter pin 119 therethrough.

The hole 20*d* is located in the sector 20*c* so that it will be in line with hole 20*e* when the teeth 23*b* are out of engagement with the slots of the counter wheels, and out of line when they are engaged. In other words the hole will be open as long as there remains anything in the counter but will be closed when the three higher order counter wheels read zero.

Means for locking machine when the meter is removed

The machine is also rendered inoperative when the meter is detached therefrom by means connecting the keyboard mechanism with the key operating the lock 17 of the meter.

The opening 121*d* (Figs. 49, 55, and 56) in frame 100*c* permits the lock 17 projecting from the side of the meter to enter when the meter is slid into place. A cylinder 121 forming an enclosure for the meter lock 17 has its flanged end 121*a* secured to the inside of the frame 100*c* around the opening 121*d*, and its inner end is closed by a plug 121*b*. Within cylinder 121 is a slidable disk 122 movable axially of the cylinder and having radially projecting lugs 122*a* which pass through longitudinal slots 121*c* in the cylinder and are engaged by a coiled expansion spring 121*s* surrounding the cylinder. This spring causes the disk to normally close the opening 121*d* (Fig. 56). The key 120 for the lock 17 is mounted within cylinder 121 and is secured to a stub shaft 120*a* rotatably mounted in a bushing 120*b* in the plug 121*b*. The hand lever 123 (Figs. 50, 50*a*) is secured to the inner end of shaft 120*a* and projects through a slot in the casing, so that it may be manually operated to turn the key.

In disk 122 is a circular opening 122*b* (Fig. 58) having diametrically opposite slots 122*c* radiating therefrom and through this opening and slots the key 120 passes (Fig. 59). The key being of rectangular cross section and extending through slots 122*c* in disk 122 cannot turn when the disk is in its outermost position (Fig. 56), but the key is provided adjacent shaft 120*a* with opposite slots 120*c* which register with the slots 122*c* in the disk when the disk is pushed inward (as in Fig. 55) by lock 17 when the meter is placed in position in the machine. This causes key 120 to enter the lock (Fig. 55) and the key 120 can then be turned by raising the hand lever 123 to the position shown in Fig. 50 which unlocks the meter for operation, and at the same time locks it in position on the machine by means of the bolt 18*b* hereinabove referred to (see Fig. 51). When the meter is to be detached the lever 123 is depressed to the position indicated in Fig. 50*a*, an arm 123*a* on the lever is then interposed between the frame 100*c* and the hooked end of an extension 119*d* of the bell crank 119*a* (Fig. 50*a*) and will prevent rocking of the bell crank 119*a*, and also through the connecting link 118*e* will prevent rocking of shaft 118 and consequently the depressing of a value key while the meter is removed. When the meter is replaced the lever 123 is raised to the position shown in Fig. 50 which unlocks the meter and moves arm 123*a* out of the way of the bell crank and releases the value keys for operation.

The means for locking the key sectors when the meter is locked or removed

A bail 125 is rotatively mounted on the rod 124 adjacent the upper ends of the key holders 106. Said bail has a depending arm 125*a* (Figs. 49–50*a*) which is connected by a link 125*e* to a third arm 123*b* of the manually operable lever 123, therefore raising or lowering of lever 123 will rock bail 125 on the shaft 124. The arm 125*c* of the bail extends toward the adjacent key holder 106 and has a pointed end 125*b* the inclined edges of which are adapted to contact with the offset end 109*b* of the slidable plate 109 which holds the value keys depressed in such key holder. The movement of the arm 125*b* from either one of its positions to the other, will cause plate 109 to move to the left and release any value key that may be depressed. An arm of the same contour as the arm 125*b* of the bail is pivoted on rod 124 op-

posite each of the other key holders to engage the plates 109 thereof, and are secured to and oscillated by and with bail 125. By these means the act of manually locking or unlocking the meter by shifting lever 123 will automatically release any value keys that may have been accidentally depressed.

Slide locking lever

When the meter is removed the several slides 16, 16a, 16d and 16t are locked in position by a bar 19 engaging notches 16h in the upper edges of the slides as indicated in Figs. 51 and 60. This bar is carried by bars 19a the upper ends of which are slidably engaged with and guided by shaft 18 and are connected by a cross rod 19b. The rod 19b is engaged by a slotted arm 18a upon shaft 18, so that when shaft 18 is rocked by the turning of the key to unlock the meter, it raises bar 19 and disengages it from the said slides.

It will be seen from the foregoing that a turn of the key in one direction will lock the meter in place, and at the same time release the mechanism for operation. Also that a reverse turn of the key will lock the operating slides and release the meter from its seat so that it can be removed.

All the mechanisms outside the meter are housed in a casing consisting of a base 100a upon which is mounted the upright frames 100b at the left, 100c at center and 100d at the right and a boxlike casting 101 opposing the space between frames 100b and 100c; casting 102 connecting frames 100b together with the wall of the box casting 101 forms the seat into which the meter or portable unit 1 is entered. The entire framework is enclosed by a sheet metal plate and all joints and doors or openings are sealed against unauthorized access to the interior mechanisms.

From the foregoing description and drawings it will be obvious that the particular machine shown is capacitated to print any value amount of postage from the minimum up to the maximum upon a strip or piece of paper fed thereto, but I do not consider the invention in its broader aspects limited to printing upon a strip for obviously a large portion of the mechanism could be readily adapted to operate directly upon envelopes or other mail matter fed therethrough by suitable mechanism instead of upon the strip. Further that the value of each impression made is printed upon a tally slip whereby an accurate check is maintained upon the operator or user of the machine, and also that all the necessary checks to prevent fraudulent use of the machine or taking of false impressions, or operating the meter when it is removed from the machine, or operating the machine when the meter is removed are provided; and also proper checks and safety devices to insure that neither the meter or machine can be operated until the meter is in proper position in the machine, and the machine will be ineffective or inoperable when the meter is removed therefrom.

I claim:—

1. In a machine of the character specified having value set-up devices including a plurality of independent orders of manually operable members, actuators controlled by said set-up means, a plurality of counters, and a series of segments adapted to operate said counters, and a detachable frame carrying said counters and said segments; means coupling said actuators to said segments when said frame is inserted in position in the machine, means to lock said frame to the machine when in such position, and whereby said frame may be unlocked and permitted to be detached from the machine thereby uncoupling the actuators from said segments.

2. In a machine of the character specified having value set-up means, actuators positively controlled thereby, a detachable meter containing a plurality of counters controlled by said actuators, a group of operating segments, and printing wheels operatively connected to said segments; said counters and printing wheels being mounted in the detachable meter, the parts being so arranged that when said meter is attached to the machine said accumulators, operating segments, and printing wheels are operable under the control of said actuators; and means whereby when the meter is detached said accumulators, operating segments, and printing wheels are automatically locked against operation.

3. In a machine of the character specified having manually operable set-up devices, actuators positively controlled thereby, and segments; printing wheels operatively connected to said segments; a printing die separate from and reciprocable with relation to said printing wheels, and adapted to cooperate with the printing wheels when in printing position to produce a printed impression of indicia stamps having the value set up by said set-up devices, means for taking an impression from the die and wheels, and independent means for taking a record separate impression from the printing wheels.

4. In a machine of the character specified having manually operable set-up devices, actuators positively controlled thereby, and segments; numeral printing wheels operatively connected to said segments, an indicia printing die reciprocable with relation to said printing wheels, and adapted to cooperate with the printing wheels, means to take an impression from said die and wheels having the value set up by said set-up devices, and means for taking a second impression from the printing wheels.

5. In a machine of the character described, a counter, a rocking segment adapted to actuate the counter, and a slide connected with the segment, a sector adjacent the counter, a slidable connector operable by the sector and adapted to operatively engage the slide, a main shaft for operating the sector, and manually operated devices for limiting the movement of the sector.

6. In a machine of the character described, a meter having a counter, a rocking segment adapted to actuate the counter, means for effecting connection and disconnection of the counter with the segment, a slide connected with the segment, an oscillating sector mounted adjacent the meter, a slidable connector adapted to operatively engage the slide, a main shaft for operating the sector and connector, and manually-operated devices for limiting the movement of the sector.

7. In a machine of the character described, a counter, a printing member, a rocking segment adapted to actuate the counter, and the printing member, a slide connected with the segment for operating the latter, a sector, operative connections between said sector and the slide, a main shaft and connections for operating the sector, and manually-controlled setting up devices for limiting the movement of the sector.

8. In combination with mechanism as set forth in claim 7, the counter having a carry over lever, an oscillating segment adapted to engage said lever, a cam member for operating such segment, a slide connected with the cam member,

and a cam on the main shaft and connections for operating such slide.

9. In a machine of the character described, a counter, a printing wheel, a rocking segment adapted to actuate the counter and printing wheel, an indicia die adjacent the printing wheel, levers for raising and lowering said die, slides operatively connected with the segment and with the said levers, a sector, a connection between said sector and the counter and printing wheel actuating slide, a main shaft and connections for operating the sector, and manually controlled setting up devices for limiting the movement of the sector; and a cam on the main shaft and devices operated by said cam for actuating the slide connected with the die.

10. In combination with mechanism as set forth in claim 9, the counter having a carry over lever, an oscillating segment adapted to engage said lever, a cam member for operating such segment, a slide connected with the cam member, and a cam on the main shaft and connections for operating such slide.

11. In mechanism of the character set forth, a meter, slides therein operatively connected with the meter mechanisms and projecting from the meter; and adapted to interlock the meter with slide operating devices when the meter is in operative position; and a locking member in the meter adapted to simultaneously engage the several slides to prevent linear movement thereof when the meter is detached from the machine.

12. In mechanism of the character set forth, a meter, slides therein operatively connected with the meter mechanisms and projecting from the meter; a locking member in the meter adapted to simultaneously engage the several slides to prevent linear movement thereof when the meter is detached from the machine, a rock shaft controlling said locking member, a lock on said shaft projecting from the meter, and adapted to enter a socket in the machine when the meter is in position, a key mounted in said socket adapted to enter the said lock when the meter is in position, and manually controlled means for operating this key.

13. In a machine of the character specified having manually operable set-up devices, actuators positively controlled thereby, a counter; counter operating segments; printing wheels operatively connected to said segments, a printing die reciprocable with relation to said printing wheels, and adapted when moved to operative position to cooperate with the printing wheels to produce a printed impression of indicia stamps having the value set up by said set-up devices; means for taking a full impression from the die and wheels; and an independent means for taking a separate partial impression from said printing die and printing wheels.

14. In a machine of the character specified having value set-up means and actuators positively controlled thereby; a detachable meter containing a plurality of counters, segments for operating said counters, and printing wheels operated by said segments, said parts being so arranged that when said meter is attached to the machine said segments are operable under the control of said actuators; and means whereby when the meter is to be detached from the machine said segments, counters and printing wheels are automatically locked against operation.

15. In a machine of the character specified having value set-up devices, actuators positively controlled thereby, a plurality of segments controlled by said actuators; counters and printing wheels operatively controlled by said segments, and an indicia printing die reciprocable in a radial direction with relation to said printing wheels and adapted to cooperate with the printing wheels to form an impression surface from which an impression bearing the value set up by said set-up devices may be taken, the segments causing the numerical value of such impression to be registered in both counters.

16. In a machine of the character specified having manually operable set-up devices, and actuators positively controlled thereby; a detachable meter containing a total counter and a subtracting counter and printing wheels and segments for operating said counters and wheels, said segments being operable by said actuators when the meter is in position on the machine; and a printing die reciprocable with relation to said printing wheels and adapted to cooperate with the printing wheels to form an impression surface from which a stamp impression having the value set up by said set-up devices may be taken.

17. In a machine of the character specified having manually operable set-up devices, and actuators positively controlled thereby; a detachable meter containing a total counter and a subtracting counter and printing wheels and segments for operating said counters and wheels, said segments being operable by said actuators when the meter is in position on the machine; a printing die reciprocable with relation to said printing wheels, and adapted to cooperate with the printing wheels to form an impression surface from which a stamp impression having the value set up by said set-up devices may be taken, and a serial number printing means also carried by said meter and locked against manipulation when the meter is detached.

18. In a machine of the character specified, a base member containing manually operable set up devices, and a series of slides operatively controlled by said set up devices; a casing mounted on said frame and containing a plurality of printing devices, segments for operating the printing devices, and slides for operating the segments; the slides being operatively engaged with the slides in the base.

19. In a machine of the character specified, a base member containing manually operable set up devices, and a series of slides operatively controlled by said set up devices; a meter mounted on said base and containing a counter, a plurality of printing devices, segments for operating the counter and printing devices, and slides for operating the segments; the meter slides being operatively engaged with the slides in the base.

20. In a machine of the character specified, a base member containing manually operable set up devices, and a series of slides operatively controlled by said set up devices; a meter mounted on said base and containing a counter, a plurality of printing wheels and indicia printing dies cooperating with the wheels, segments for operating the counter, printing wheels and dies, and slides for operating the segments; the meter slides being operatively engaged with the slides in the base when the meter is operatively mounted on the machine.

21. In a machine of the character specified, a base member containing manually operable set up devices, a series of slides operatively controlled by said set up devices, and a main shaft and connections whereby said slides are positive-

ly actuated; a meter detachably mounted on the base and containing printing devices, and slides and connections for operating the printing devices; the meter slides being adapted for engagement with the slides in the base when the meter is properly positioned on the base.

22. In a machine of the character specified, a base member containing manually operable set-up devices, a series of slides operatively controlled by said set-up devices, impression devices, and a main shaft and connections whereby said slides and impression devices are positively actuated; a meter detachably mounted on the base and containing printing devices, and slides and connections for operating the printing devices; the meter slides being adapted for engagement with the slides in the base and the printing devices operatively positioned opposite the impression means when the meter is properly positioned on the base.

23. In a machine of the character specified, a base member containing manually operable set-up devices, a series of slides operatively controlled by said set-up devices, impression devices, and a main shaft and connections whereby said slides and impression devices are positively actuated; a meter detachably mounted on the base and containing counters, printing devices, and slides and connections for operating the counters and printing devices; the meter slides being adapted for engagement with the slides in the base and the printing devices in the meter being operatively positioned opposite the impression means when the meter is properly positioned on the base.

24. In a machine of the character specified having a plurality of counters, printing devices consisting of numeral type surrounded by indicia type, and means for variably setting such numeral type to print any desired number up to a maximum; means for successively taking a whole impression from such printing devices while they remain in one position upon a detachable strip and a full numeral impression with partial indicia impression upon a record strip during each operation of the machine, and means whereby the amount printed may be registered in both counters.

25. In a machine of the character described having an adding counter, a subtracting counter, manually controlled setting up devices whereby any variable amount up to the maximum may be set up; printing devices consisting of numeral type surrounded by indicia type, and means for variably setting such numeral type to print the amount set up; means for successively taking a whole impression from such printing devices while in one position upon a detachable strip, and a full numeral impression with partial indicia impression upon a record strip during each operation of the machine, and means whereby the amount printed may be additively registered in one counter and a like amount simultaneously subtractively registered in the other counter.

26. In a machine of the character described, a counter having a carry over lever, a rocking segment adapted to actuate the counter, means for effecting connection and disconnection between the counter and the segment, manually controlled means and connections for variably limiting the rocking movement of said segment, an oscillating sector adapted to engage the lever, a cam member for operating the sector, a shaft, a cam on the shaft, and connections for operating said cam member by said cam.

27. In a machine of the character specified having manually operable set-up devices, actuators positively controlled thereby, and a counter; counter operating segments; printing wheels operatively connected to certain of said segments, a printing die operatively connected to other of said segments, means for taking a full impression record from the printing die and printing wheels when both are assembled at the impression point, and independent means for thereafter taking a second impression from the printing wheels and a partial impression from said printing die, both said impressions being taken during each operation of the machine.

28. In a machine of the character specified having manually operable set-up devices, actuators positively controlled thereby, and two counters; counter operating segments; numeral printing wheels operatively connected to certain of said segments; an indicia printing die operatively connected to other of said segments; means to take a full impression from both the numeral wheels and die bearing the value set up by said set up devices, and independent means for taking a second impression from the numeral wheels and a partial impression of said indicia die during each complete operation of the machine, the numeral value of such full impression being added in one counter and subtracted in the other.

29. In a machine of the character specified having printing devices consisting of numeral type surrounded by indicia type, means for variably setting such numeral type to print any desired number up to a maximum, means for successively taking an impression from such type and indicia on a strip and a second impression from the numeral type and parts of the indicia on a second strip during each operation of the machine; a plurality of counters, and means whereby the full amount printed at each operation of the machine may be registered in said counters.

30. In a machine of the character specified having numeral printing type and separate indicia printing devices surrounding the numeral type; means for variably setting such numeral printing type to print any desired number up to maximum; means for assembling the indicia printing devices with the numeral type; means for first taking a full impression from such numeral type and indicia printing devices on a record sheet; and means for thereafter taking a second impression from the numeral type and part of the indicia devices on a second record sheet, the printing operations being performed successively during each complete cycle of operations of the machine; a plurality of counters, and means whereby the amount printed at the full impression is registered in said counters.

31. In a machine of the character specified, manually operable value set-up devices, printing wheels operatively controlled by said set-up devices, and an indicia printing die reciprocable with relation to said printing wheels and adapted to cooperate with the printing wheels to form an impression surface from which an impression bearing the value set up by said set-up devices may be taken, the die when in printing position preventing change of adjustment of the printing wheels.

32. In a machine of the character specified having manually operable set-up devices, and actuators positively controlled thereby; printing wheels operable from and by said actuators; and a printing die reciprocable with relation to said printing wheels and adapted to cooperate with

the printing wheels to form an impression surface from which a stamp impression having the value set up by said set-up devices may be taken, said die when in printing position blocking adjustment of the printing wheels.

33. In a machine of the character described, a counter, a printing member, a rocking segment adapted to actuate the counter and the printing member, said counter having a swingable member adapted to be engaged with the segment, means adapted to move the said member to effect connection and disconnection thereof with the segment, a slide connected with the segment for operating the latter, a sector, operative connections between said sector and the slide, a main shaft and connections for operating the sector, and manually-controlled setting up devices for limiting the movement of the sector.

34. In a machine of the character described, a counter, a printing member, a rocking segment adapted to actuate the counter and the printing member, a slide connected with the segment for operating the latter, a sector, operative connections between said sector and the slide, a main shaft and connections for operating the sector, manually-controlled setting up devices for limiting the movement of the sector; said counter having a swingable member adapted to be engaged with the segment, a cam member adapted to move the swingable member to effect connection and disconnection thereof with the segment, a slide connected with said cam member; and means for operating the said slide from the main shaft.

35. In a machine of the character described, a swingable counter, a printing member, a rocking segment adapted to actuate the counter and the printing member, a member adapted to swing the counter to effect connection and disconnection thereof with the segment, a slide connected with the segment for operating the latter, a sector, operative connections between said sector and the slide, a main shaft and connections for operating the sector, a second slide connected with said member, a cam on the main shaft and connections for operating the second slide, and manually-controlled setting up devices for limiting the movement of the sector.

36. In a machine of the character described, a counter, a printing wheel, a rocking segment adapted to actuate the counter and printing wheel, an indicia die adjacent the printing wheel, levers for raising and lowering said die, slides operatively connected with the segment and with the said levers; said counter having a swingable member adapted to be engaged with the segment, means adapted to move the said member to effect connection and disconnection thereof with the segment, a sector, a connection between said sector and the counter and printing wheel actuating slide, a main shaft and connections for operating the sector, and manually-cotrolled setting up devices for limiting the movement of the sector; and a cam on the main shaft and devices operated by said cam for actuating the slide connected with the die.

37. In a machine of the character described, a counter, a printing wheel, a rocking segment adapted to actuate the counter and printing wheel, an indicia die adjacent the printing wheel, levers for raising and lowering said die, slides operatively connected with the segment and with the said levers, said counter having a swingable member adapted to be engaged with the segment, a cam member adapted to move the swingable member to effect connection and disconnection thereof with the segment, a slide connected with the cam member, a sector, a connection between said sector and the counter and printing wheel actuating slide, a main shaft and connections for operating the sector, means for operating said cam member slide from the main shaft, manually-controlled setting up devices for limiting the movement of the sector; and a cam on the main shaft, and devices operated by said cam for actuating the slide connected with the die.

38. In a machine of the character described, a swingable counter, a printing wheel, a rocking segment adapted to actuate the counter and printing wheel, a member adapted to swing the counter to effect connection and disconnection thereof with the segment, and a slide connected with said cam member, an indicia die adjacent the printing wheel, levers for raising and lowering said die, slides operatively connected with the segment and with the said levers, a sector, a connection between said sector and the counter and printing wheel actuating slide, a main shaft and connections for operatig the sector, manually-controlled setting up devices for limiting the movement of the sector; a cam on the main shaft, devices operated by said cam for actuating the slide connected with the die, and a cam on the main shaft and connections for operating the slide connected with the counter swinging members.

39. In a machine of the character described, a detachable meter having included therein: a counter having a carry over lever, a rocking segment adapted to actuate the counter, means effecting connection and disconnection between the counter and the segment, an oscillating member movable to engage the lever and operable during each machine cycle of operation; manually controlled means for variably limiting the rocking movement of the segment, and means whereby the rocking segment and oscillating member are locked against movement when the meter is detached from the machine.

40. In a machine of the character described having a base unit and a meter unit detachably mounted upon said base unit, an impression member associated with the base unit, a printing device including a plurality of ordinal type wheels carried by the meter unit and adapted to cooperate with said impression member to print stamps of varying value, a registering device including counters carried by said detachable meter, value set-up means, actuating means, means connecting said actuating means in operable relation with the type wheels and counters when the meter is mounted upon the base unit, and means whereby the counters and printing wheels are automatically locked against operation when the meter is detached from the base unit.

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