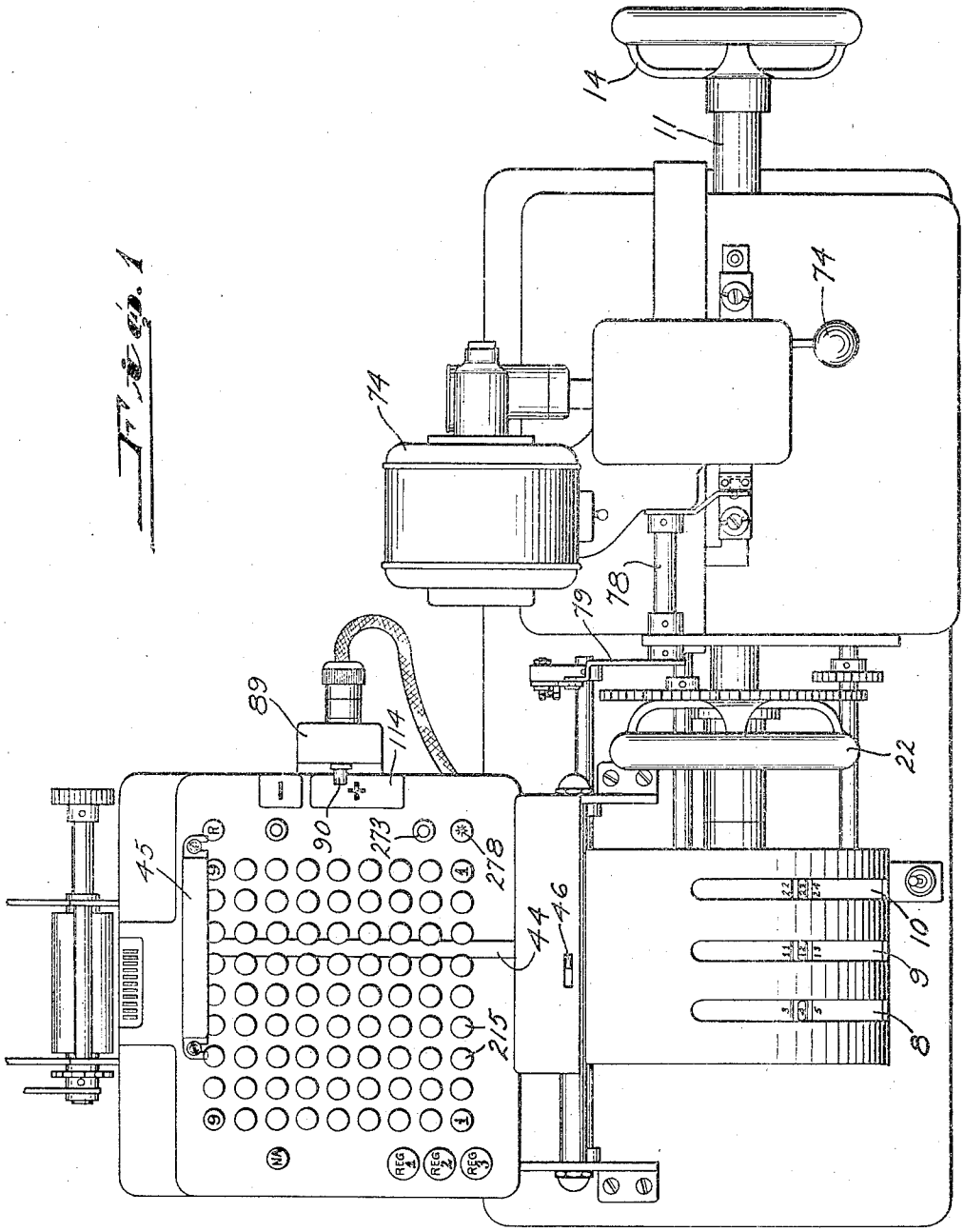
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CHECKWRITER

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Fig. 1



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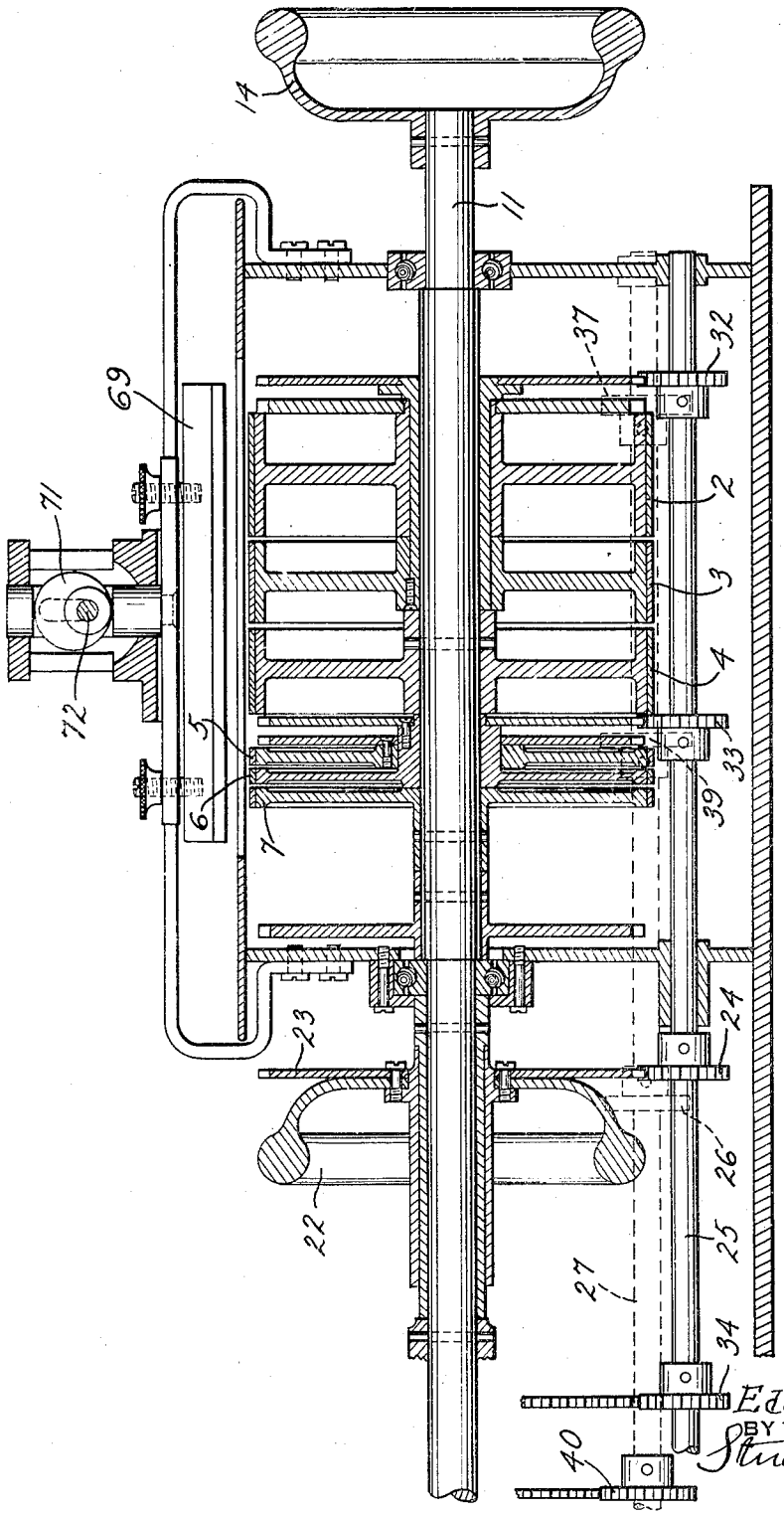


Fig. 2.

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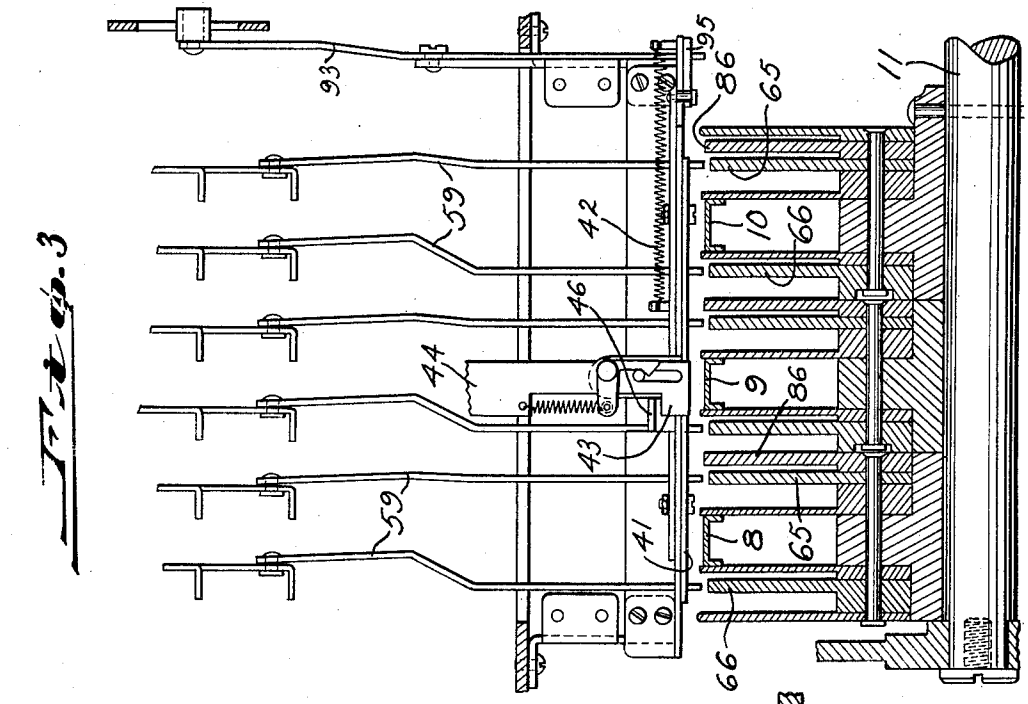


Fig. 3.

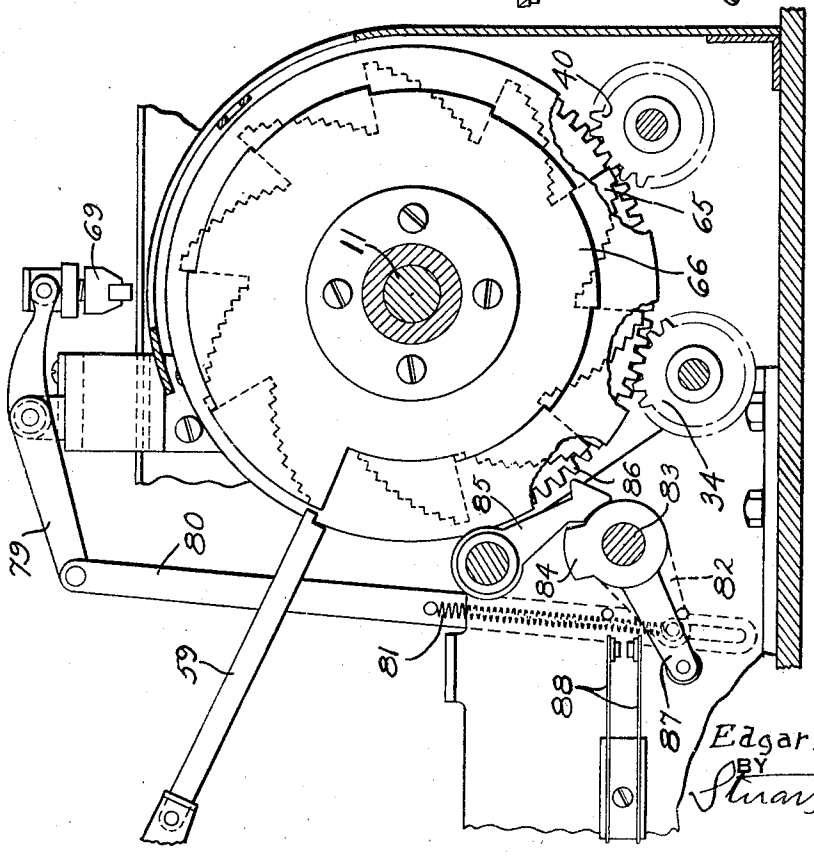


Fig. 4.

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CHECKWRITER

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Fig. 5

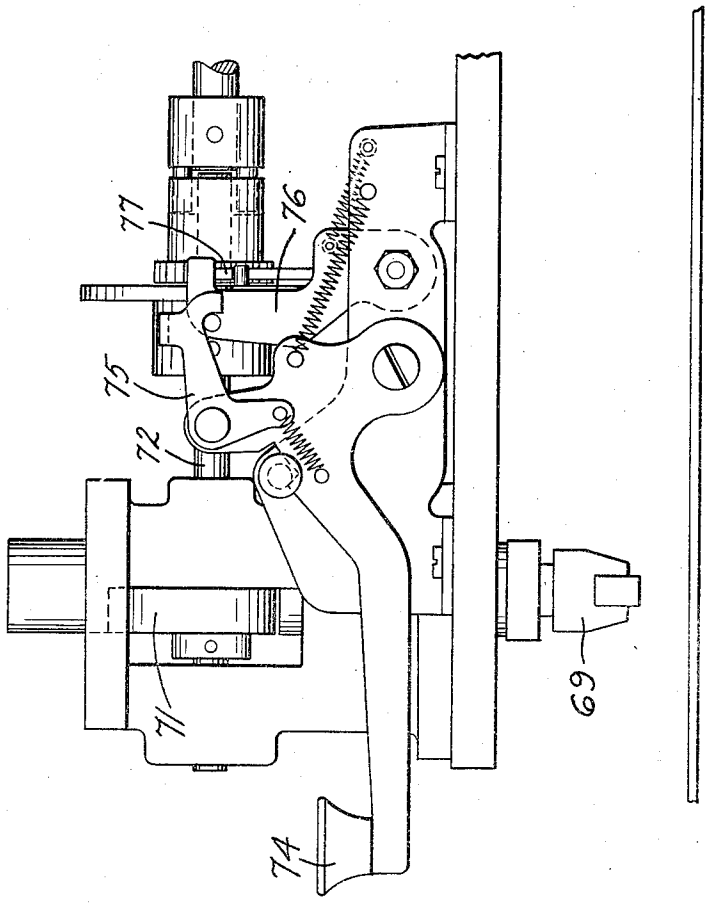
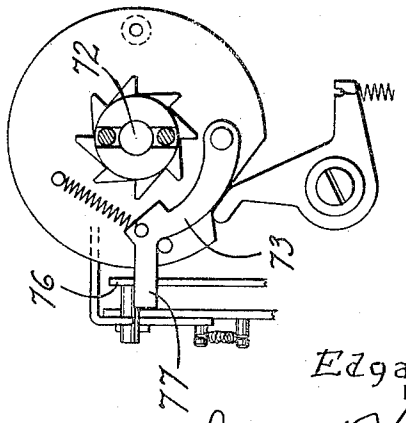


Fig. 9



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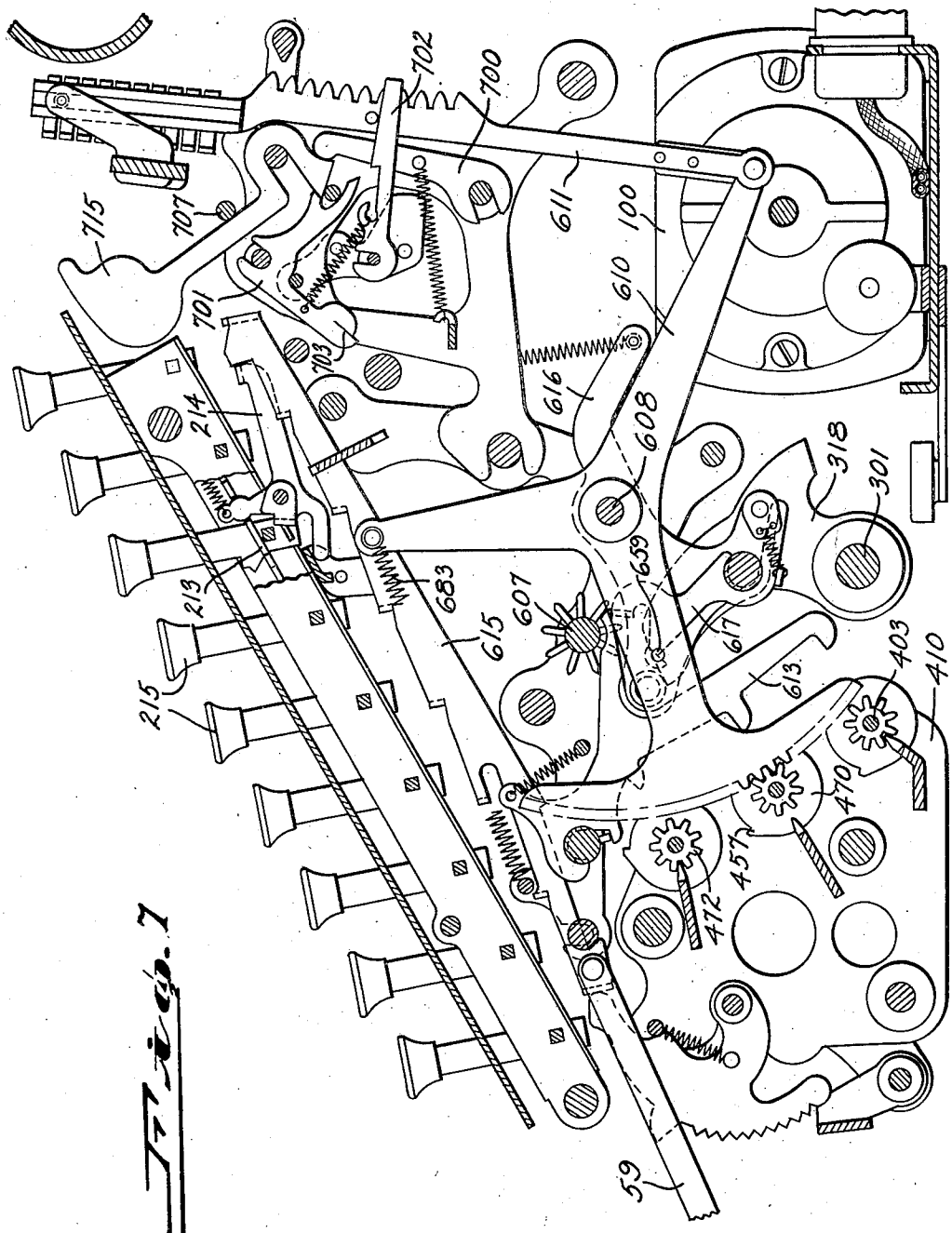


Fig. 1

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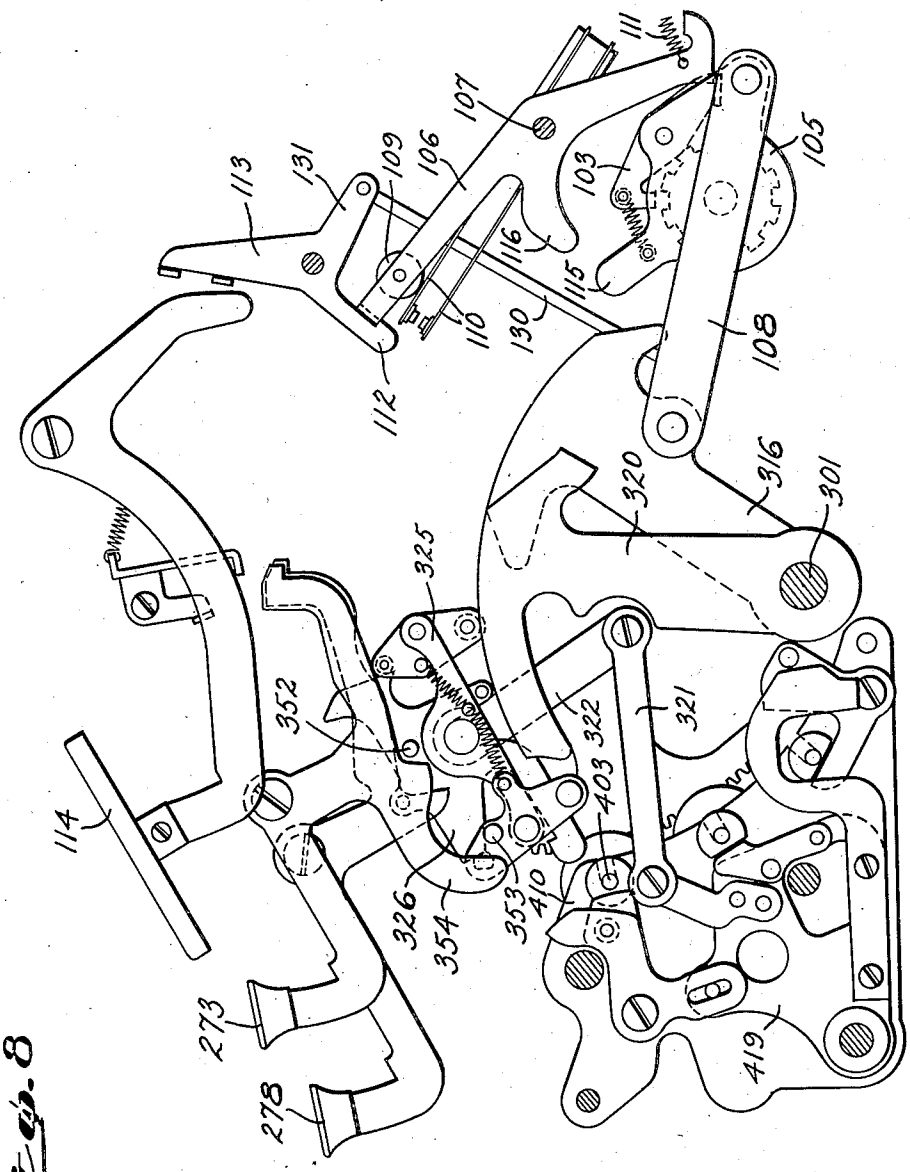


Fig. 8

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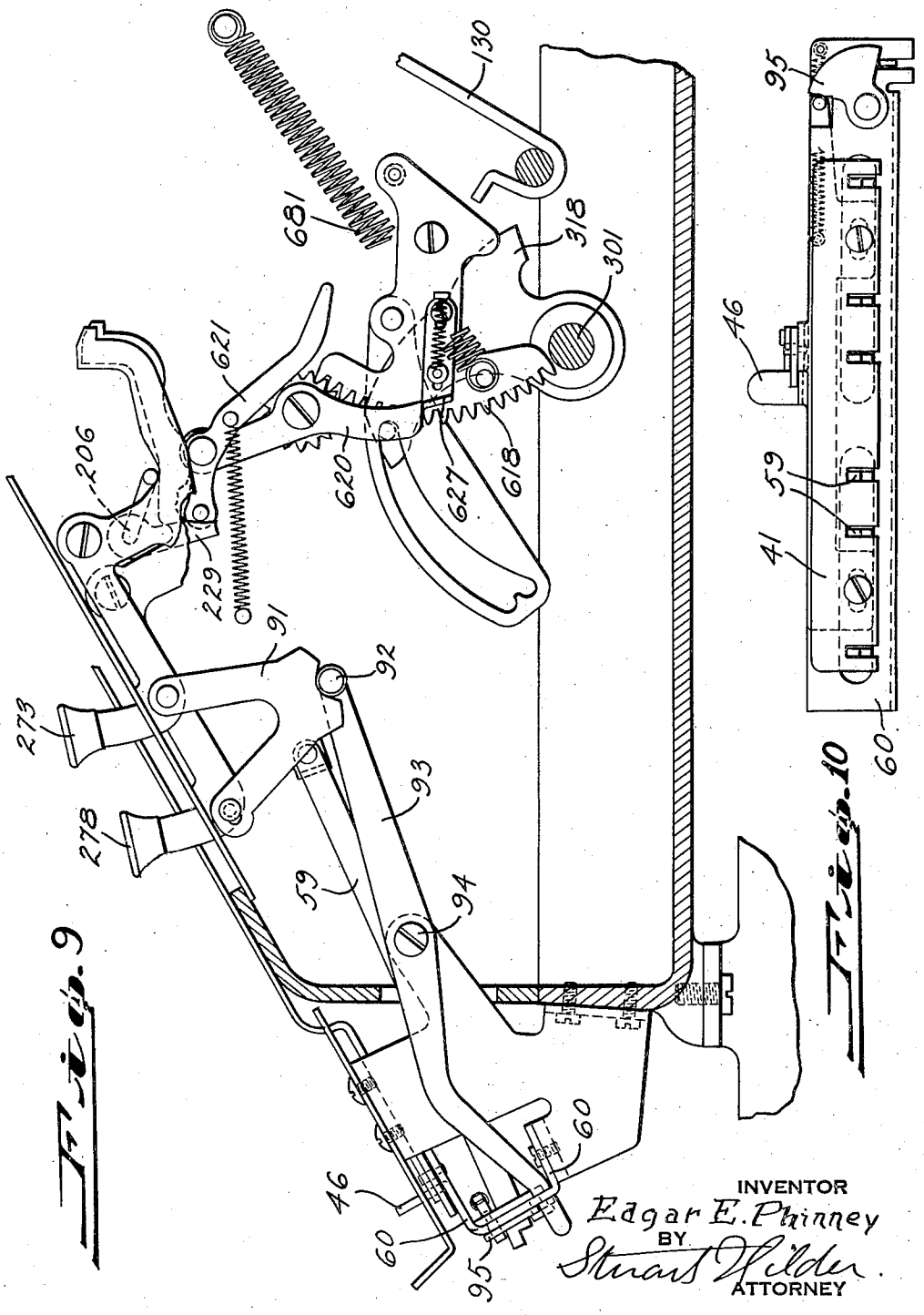


Fig. 9

Fig. 10

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UNITED STATES PATENT OFFICE

1,923,685

CHECKWRITER

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Application September 30, 1932
Serial No. 635,543

5 Claims. (Cl. 235—58)

The invention has relation to checkwriters, and more particularly to means for accumulating and printing the total amounts which have been written into a series of checks during the operation of the machine.

The invention consists in the novel construction and combination of parts, as set forth in the appended claims.

According to the present disclosure, the invention is embodied in a Defiance checkwriting machine, shown in its essential features in U. S. Patent No. 1,160,646, issued November 16, 1915, to Edmund Ocumpaugh, with which machine is combined a Gardner calculator, disclosed in U. S. Patent No. 1,867,002, issued July 12, 1932, to Clyde Gardner, deceased; as modified by the disclosures of the patent application of Loring P. Crossman No. 518,061 filed February 25, 1931. Certain features of the mechanism whereby the calculator is controlled by the setting of the checkwriter type wheels is shown in U. S. Patent No. 1,134,551, issued April 6, 1915, to Edmund Ocumpaugh 2nd.

In the accompanying drawings, illustrating the invention:

Fig. 1 is a plan view of a combined checkwriter and accumulating machine constructed in accordance with the invention.

Fig. 2 is a longitudinal section taken through the axial plane of the checkwriter.

Fig. 3 is a similar section, showing the indicating and control devices to the left of the checkwriter.

Fig. 4 is a left side elevation of the same, with the casing broken away.

Fig. 5 is a detail right side elevation of the platen operating means.

Fig. 6 is a detail face view of the main clutch.

Fig. 7 is a section taken through the keyboard of the calculator.

Fig. 8 is a right side elevation of the operation control devices of the calculator.

Fig. 9 is a right side elevation of the total key mechanism.

Fig. 10 is a detail front elevation of the feeler adjusting means.

The checkwriter

In these drawings the numerals 2, 3, 4 (Fig. 2) designate type wheels, whereon different amounts, to be printed on the checks, are designated in words, these wheels being associated with wheels 5, 6, 7 whereon the same amounts are designated in figures, and on wheels 8, 9 and 10 (Figs. 1 and 3), designed to display the amount standing on the printing line. All of these wheels are supported upon a shaft 11. Wheels 2, 5, 8 represent thousands and hundreds of dollars, and are adapted to be simultaneously adjusted, when amounts are set up, by means of a hand wheel 22, slidably mounted on shaft 11, said wheel occupying the position illustrated in Fig. 2, wherein a gear 23, attached to the wheel, meshes with a pinion 24 fast upon the shaft 25. Pinions 32, 33, 34, also fast to said shaft, engage gears fast to the wheels 2, 5, 8, serving to connect these wheels with the hand wheel 22. When hand wheel 22 is shifted to the left, gear 23 will mesh with a pinion 26, fast to a shaft 27, to which are also fixed pinions 37, 39, 40 which mesh with gears connected with the wheels 3, 6, 9, respresenting the units and tens, connecting these wheels with the hand wheel 22. A second hand wheel 14, is fast upon the shaft 11, the wheels 4, 7 and 10, representing cents, being also fast upon this shaft, so that these wheels may be set by means of the hand wheel 14.

The platen 69 is operated against the type set up on the wheels 2 to 7 by a cam 71, mounted on a motor driven shaft 72 (Figs. 2 and 5), a clutch 73 (Fig. 6) being interposed between the motor 74 and the cam 71.

Clutch 73 is controlled by an operation key 74 having a pawl 75 adapted in the depression of the key to retract the stop lever 76, and allow the clutch element 73 to engage with the driven element of the clutch. At the end of a rotation, lug 77 of element 73 will reengage stop lever 76, and the clutch will be released.

The calculator

The machine employed to accumulate the amounts set up in the type wheels and printed on the checks, operates as follows:

For each denominational order, the machine is provided with a three-armed actuator lever, numbered 610 on the drawings (Fig. 7), these levers being loosely mounted on a shaft 608. The forward arm of each lever 610 terminates in a segmental registering rack; the rearward arm has a listing type bar 611 pivoted thereto, and the upper arm has pivotal connection with a differential stop bar 615 cooperating with a bank of digit keys 215 to limit the movement of the lever 610.

The digit keys 215 which have been depressed to represent a value are latched in position with the bottoms of their stems lying in the path of movement of the related stop lugs of the bars 615, allowing such bars to advance a distance proportional to the value of the key, upon opera-

tion of the machine. Depression of a digit key will also cam slide 213 forwardly and thereby remove a column latch 214 from the path of movement of its related bar 615, these latches preventing movement of a stop bar and lever 610 in any column in which no key is depressed.

A rock shaft 301 is provided with cam means 318 for governing the movement of a spring tensioned rocker frame 616, mounted on shaft 608; frame 616 carrying a series of dogs 617 normally engaged by studs 659 of the levers 610. As shaft 301 is rotated forwardly, frame 616 will be rocked, and any of the levers 610 which have been released by the depression of digit keys will be allowed to rotate, under the influence of their springs 683, until they are stopped by the lugs of bars 615 contacting with the stems of the keys. Upon rearward rotation of shaft 301, the dogs 617 will return the operated levers 610 to normal position. This excursion of the levers 610 serves to register amounts set in the keyboard upon one or more accumulators and to set up a similar amount on the printing line of the type bars.

Shaft 301 is oscillated by means of an electric motor 100, connected through suitable gearing and spring clutch 103 (Fig. 8) with crank arm 105. Clutch 103 has a lug adapted to contact with the lower arm of a clutch lever 106, fulcrumed upon the framing of the machine at 107. Crank arm 105 is connected to an arm 316, fast with shaft 301, by means of a connecting rod 108, so that as crank arm 105 is rotated shaft 301 will be oscillated.

Clutch lever 106 is provided with an insulated roller 109, adapted to close contact members 110 after lever 106 is moved out of restraining engagement with clutch 103. Contacts 110, constitute circuit breaking devices in the electrical connection of motor 100.

Spring 111 tends to pull lever 106 away from clutch 103, the lever being normally held in engaging position by means of a latch 112. Latch 112 is controlled by a trigger 113, lying in the path of movement of a lever arm connected with an add key or plus bar 114. Upon depression of key 114, trigger 113 will release latch 112 and clutch lever 106 will be pulled out of engagement with clutch spring 103 to start the machine in operation.

Upon release of key 114 latch 112 will return under spring action into latching position, and toward the end of the cycle of operation an arm 115 connected with the crank member 105 will contact with a tooth 116 of the clutch lever 106 and will force said lever back into latching position, breaking the electric circuit and bringing the end of lever 106 into the path of movement of the rotating clutch element 103.

The segmental racks of the levers 610 are designed to operate the accumulator wheel gears 472 (Fig. 7) of one or more accumulators. These accumulators are means for storing sub-totals, totals or remainders, to be printed, but could, of course, be provided with visible numeral wheels, from which the accumulated amounts could be read. Tens transfer mechanism 470 is provided, between the accumulator wheels, as in Patent 1,867,002.

The accumulator shafts 403 are slidably mounted in slots of frame plates 410 (Fig. 8), and when any accumulator is set to active position, the gears 472 thereof are brought into mesh with the racks of the levers 610, where they are held, against spring tension exerted on shaft 403 by a rocking cam plate 419, engaging said shaft.

The cam plate 419 has connection through link 321 with an arm 322 of a rocker device 325, provided with two cam followers adjustable by keyset control devices to different positions relative to cam arms 316 and 320, respectively of rock shaft 301.

Normally these control devices are set to provide for additive registration, wherein the accumulator shaft 403 will be moved (by cam 320 and the forward follower) away from the racks of levers 610 before said racks are allowed to move, and will be moved (by cam 316 and the rearward follower) to reengage the gears 472 while the racks lie in the extreme positions permitted by the keys 215 and the stop bars 615.

As shaft 301 is returned, and the racks are raised, the value set in the keyboard will be additively transferred to the rgeister.

The type bars 611 are provided each with a row of type, representing the digits 1 to 9 and 0, the zero type being normally on the printing line. When the levers 610 are moved in accordance with a key setting, the related type bars will be raised to bring the appropriate type to the printing line.

The type hammers 715 (Fig. 7) are adapted to be operated by spring impelled actuators 700, but are normally held in tensioned position by latches 701. When a type bar is lifted, a tripping finger 702 is allowed to move into engagement with the corresponding latch 701, and, at the end of the forward rotation of shaft 301, a frame upon which the tripping fingers are mounted is moved forwardly, releasing the hammers from those latches which have been engaged by the fingers 702. In order to print the zero characters in the lower order places wherein no amount from 1 to 9 has been set up, the higher order latches 701 are provided with offsets 703, lying in the planes of and designed to trip the lower order latches.

The hammers are restored and relatched during the return rotation of shaft 301 by means of a bail 707, operated through a reciprocatory cam.

Controlling the registration

In order to set the actuator levers 610 of the calculator in accordance with the setting of the type wheels 2 to 7, each indicating wheel 8, 9, 10 is provided with two disks 65 and 66 (Fig. 4), the disk 65 being provided with ten series of stepped notches, adapted to be engaged by a feeler 59, secured to the stop bars 615, this disk representing the lower of the two denominational orders, represented on its wheel 8, 9 or 10. Disk 66 is provided with a single series of steps, adapted to be engaged by a similar feeler 59, this disk representing the higher of the two denominational orders of the wheel 8, 9 or 10. The disks 65 and 66 being adjusted by means of the hand wheels 14 and 22, it will only be necessary to release the levers 610 and to operate the calculator, in order to accumulate the amounts set up.

When the calculator is operated to accumulate in accordance with the setting of the keys 215, the column latches 214 restrain the stop bars 615 and lever 610, and the feelers 59 are also held out of alignment with the disks 65 and 66, by means of a notched slide 41 (Figs. 3 and 10), with the notches of which the forward ends of the feelers 59 register. Slide 41 (which is shown as composed of two plates, lying upon opposite sides of frame plate 60, and connected by bolts passing through slots of said frame plate) is provided with a spring 42 tending to move it into

feeler aligning position, this movement being resisted, when the calculator is being used separately by a lug 43 of a slide 44, (Figs. 1 and 3) engaging a lug 46 of slide 41. Slide 44 extends across the keyboard plate and is provided with a head 45 adapted to engage over and lock the 9 keys of the calculator in depressed position. This has the effect of releasing the column latches 214, and of allowing maximum movement of the levers 610. It will be noted from Fig. 1 that six 9 keys are engaged by head 45, this corresponding to the six denominational places represented in the type wheels.

The machines being thus brought into cooperating condition, the parts will be held as adjusted by means of the lug 46 of slide 41 engaging with the shoulder of lug 43 of slide 44.

At each operation of the platen 69, the calculator is adapted to be operated by the following means:

The rock shaft 78 of the reciprocatory platen is provided with an arm 79 (Figs. 1 and 4) connected by link 80 and spring 81 with an arm 82, fast upon alignor shaft 83. Shaft 83 is provided with three cams 84, each adapted upon rotation of the shaft to force a detent 85 between the teeth of a gear 86, fast to one of the wheels 8, 9, 10. A roller arm 87 is also fast to shaft 83, the roller of said arm being adapted when the shaft is rocked to close a contact 88 in an electric circuit having included therein a solenoid 89. When this circuit is closed, and solenoid 89 energized, it will depress a pin 90 overhanging plus bar 114, and thereby depress the plus bar and set the calculator in operation. It will be noted, that circuit 88 cannot be closed and the solenoid energized until each of the detents 85 is fully seated between the teeth of the gears 86, and hence until the related type wheels are brought into exact alignment at the printing line.

Printing the total

When it is desired to ascertain the total amounts printed on the various checks, a sub-total or a total key will be operated, to print the total, the accumulation being left in the wheels or the wheels being set to zero according to whether the sub-total or the total key is operated.

To do this, it is first necessary to move the feelers 59, so that they may not operate to limit the movement of the levers 610, in taking the total. Therefore, a cam plate 91 (Fig. 9) is pivotally attached to the sub-total key 273 and to the total key 278, so that on depression of one of these keys plate 91 will swing upon its connection with the other key as a fulcrum and will depress a roller 92, carried upon the end of a lever 93 intermediately fulcrumed at 94, and having engagement at its forward end with a dog 95 (Fig. 10). Dog 95 engages a pin on the side 41, whereby depression of a key 273 or 278 will move the slide and thereby the feelers 59, and will hold the feelers out of line with the disks 65, 66, so long as the respective key is held depressed.

A sub-total is taken by releasing the differential stop bars 615 and allowing their segment racks to rotate the accumulator gears subtractively until suitable pins on the accumulator wheels contact with zero stop members. This will set the sub-total in the type bars, and the hammers will be tripped to print the sub-total. The bar 615 are then reengaged with the oscillating frame and during the return stroke of said frame are moved rearwardly to normal position, rotating the accumulator wheels forwardly to restore the registration previously appearing in the accumulators. Obviously, only one of the accumulators will be set to active position (by an appropriate control key) when a sub-total is to be taken. Totals are printed in a similar manner, except that the accumulators are disengaged from the racks before the return stroke is made, whereby the register which has had its total taken will stand at 0.

To accomplish these operations the sub-total key 273 and total key 278 are both adapted to engage a pin 352 (Fig. 8) of the rocker control plate 326, moving said plate so as to release the forward cam follower and so as to move the rearward cam follower pivotally into inactive position. Thus, upon movement of shaft 301 the forward follower will move pivotally when contacted by cam arm 320 in its forward rocking movement, so that the accumulator will be left in engagement with the racks 610 throughout this movement, during which the accumulator wheels will be turned back to 0 and the type bars 611 correspondingly positioned. If the total key has been depressed, the forward cam follower will ride up the cam surface of plate 320 on the reverse movement thereof and, because of a limit stop engagement with rocker 325 will move the rocker clockwise as viewed in Fig. 8, thereby, through arm 322 and link 321 rocking cam plate 419 to inactive position, whereby the register will become disengaged from the rack 610 and, after the printing operation the racks will be restored idly to normal position. The sub-total key, however, is provided with a spur 354, contacting upon depression of the key with a pin 353 on the forward cam follower, moving said follower pivotally and holding the same in inactive position. Therefore, it will be seen that the sub-total key holds both of the cam followers inactive and the totalizer is held in mesh with the racks 610 during both the forward and reverse strokes of the operating handle. The other operations following the depression of key 273 or key 278 are identical, and will be described without distinguishing between total and sub-total operations.

The final movement of the depressed total or sub-total key will trip a latch 620 (Fig. 9) through operation of a shaft 206, having an arm 229 contacting with a control arm 621 pivotally connected to said latch. Latch 620 normally engages a lug 627 on total segment 618, preventing movement of said segment under the influence of the total spring 681. Upon tripping of the latch, segment 618 will, through appropriate gearing, rotate a shaft 607 (Fig. 7) provided with a series of spirally disposed pins acting to trip the latching dogs 617 successively from right to left of the machine and will also bring a stop member 613 into the path of the 0 stops 457 on the accumulator wheels.

When this zeroizing operation has progressed to the left hand side of the machine, a rearwardly extending arm of the total segment 618 will contact with a projection of a rod 130 (Figs. 8 and 9) connected at its other end to a trigger 131, adapted to release latch 112, to start the machine. The machine being put in operation, the differential stop bars 615 will be relatched, the hammers will be tripped, and the parts restored to normal position.

I claim:

1. In a checkwriter having adjustable type and means for setting selected type to the printing

line; an accumulating register having actuators, stops adjustable by the type setting means, feelers adapted to limit the registering movement of the actuators in accordance with the adjustment of the stops, total printing mechanism including a total key, and a member operable by said key to move the feelers to inoperative position.

2. In a checkwriter having adjustable type and means for setting selected type to the printing line; an accumulating register having actuators, stops adjustable by the type setting means, feelers adapted to limit the registering movement of the actuators in accordance with the adjustment of the stops, total printing mechanism including a total key, and a spring retracted slide supporting one end of the feelers and operable by the total key to move said feelers to inoperative position.

3. In a checkwriter having adjustable type and means for setting selected type to the printing line; an accumulating register having actuators, column latches normally holding said actuators inactive, stops adjustable by the type setting means, normally inactive feelers adapted to limit the registering movement of the actuators in accordance with the adjustment of the stops, and a member manipulable to hold said column latches in inactive position and to control the shift of said feelers to active position.

4. In a checkwriter having adjustable type and means for setting selected type to the printing line; an accumulating register having actuators, column latches normally holding said actuators inactive, stops adjustable by the type setting means, normally inactive feelers adapted to limit the registering movement of the actuators in accordance with the adjustment of the stops, a member manipulable to hold said column latches in inactive position and to control the shift of said feelers to active position, and a manually retractible feeler shifting device having latching engagement with said member.

5. In a checkwriter having adjustable type and means for setting selected type to the printing line; an accumulating register having actuators, column latches normally holding said actuators inactive, keys depressible to release corresponding column latches and to limit the registering movement of the actuators differentially, normally inactive means for limiting the registering movement of the actuators in accordance with the selected type, means for adjusting the last-named means to active position, and a cooperating member operable to latch the maximum movement keys in depressed position.

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