Jan. 30, 1962 F. A. DEUTSCH 3,018,953

RESETTING MECHANISM

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Fig. 1.

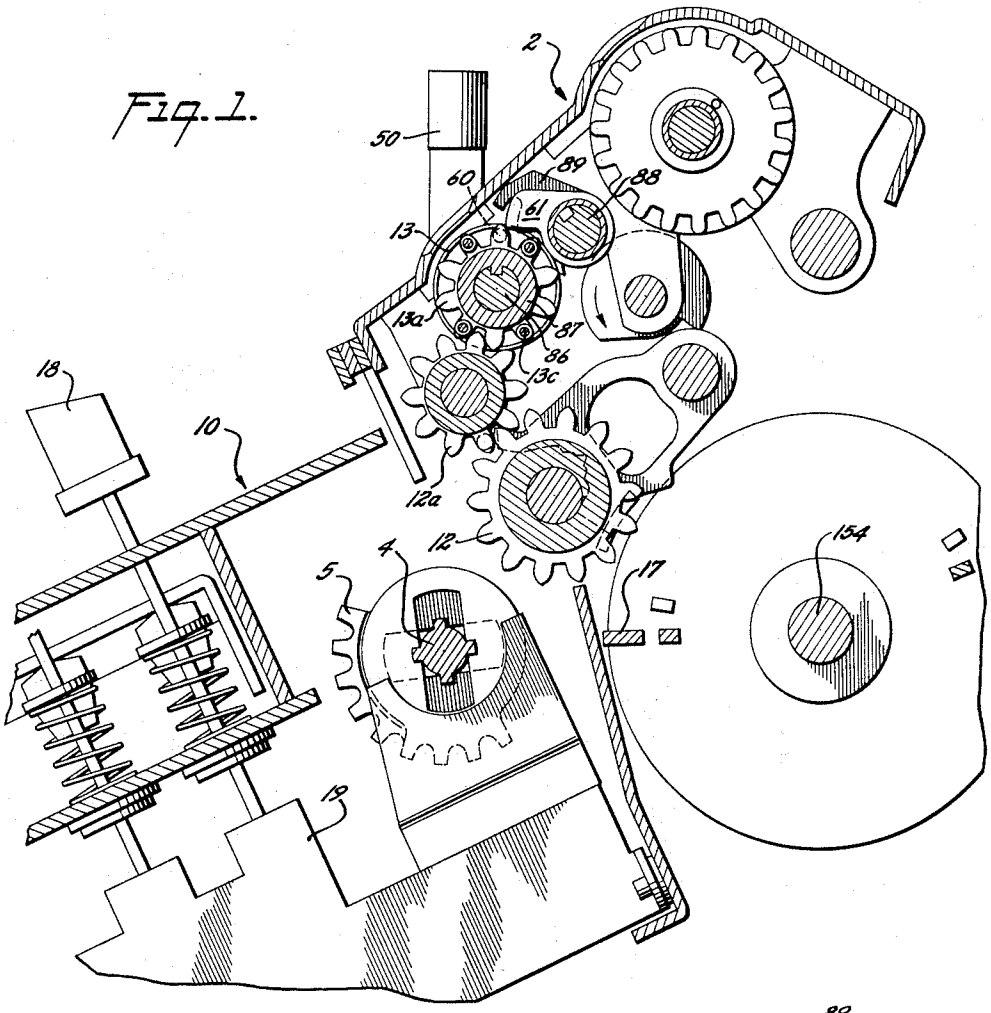

Fig. 2.

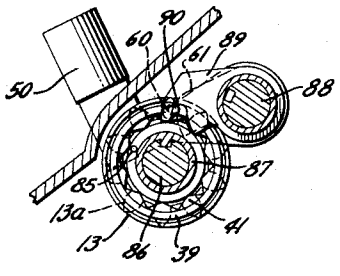

Fig. 3.

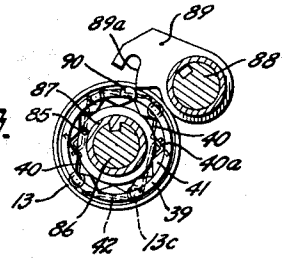

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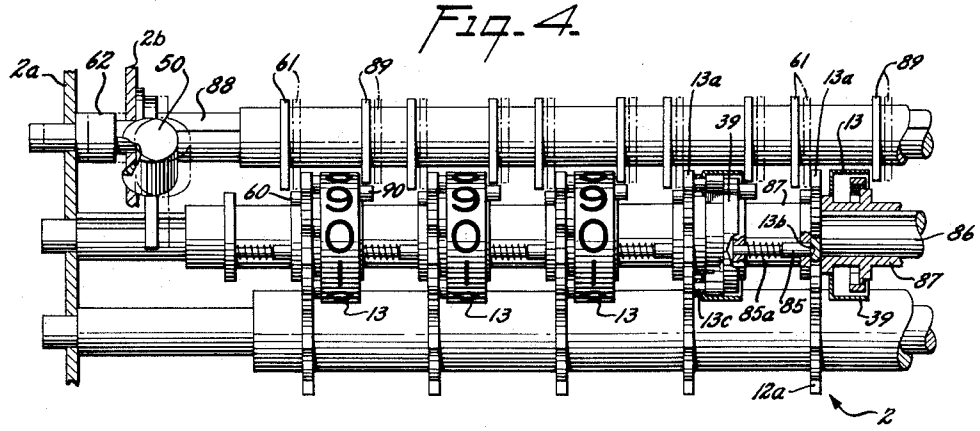
Fig. 4.



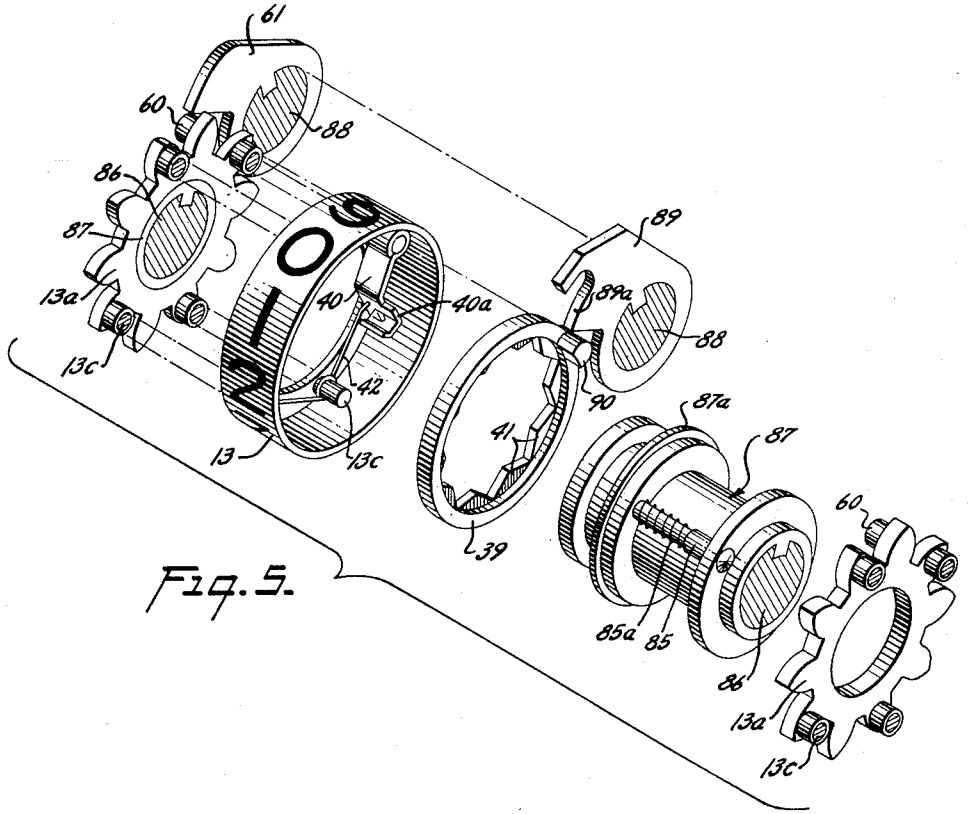


Fig. 5.

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RESETTING MECHANISM

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5 Claims. (Cl. 235—144)

The present invention pertains to calculating machines and more particularly to resetting mechanism for the registers thereof.

The registers of calculating machines are sometimes provided with constant factor clearing or resetting mechanism which enables the register to be cleared to any desired value rather than being invariably cleared to zero as is the case with conventional clearing means. Patent 1,995,434, issued to A. A. Overbury, March 26, 1935, is exemplary of such constant factor mechanisms. The mechanism disclosed therein includes a rotatable resetting device associated with a register wheel and adapted to be restored to a predetermined home position. The associated numeral wheel is adjustably coupled to the resetting device for movement therewith and is normally so angularly disposed relative thereto that it registers zero when the device is restored to the predetermined position. For constant factor operation, the wheel and resetting device are adjusted angularly relative to each other to such position that the wheel registers the desired constant value when the resetting device stands in its predetermined position. Subsequent operation of the resetting mechanism to return the resetting member to home position will thus clear the numeral wheel not to zero but rather to the constant value.

With prior art machines of the nature described above, if the operator is performing a series of calculations employing a constant factor but desires to interpose a calculation which necessitates clearing the register to zero, it will be seen that the mechanism must first be adjusted to remove the constant factor and must then be readjusted to restore the constant factor.

In accordance with the present invention, mechanism is provided which enables the register to be cleared to zero with retention of the constant factor. Thus the constant factor may be stored for as long as desired and the register cleared to zero without removal of the constant factor setting. As described in detail hereinafter, the preferred embodiment of the invention comprises a calculating machine having a register provided with constant factor clearing mechanism which is adjustable to effect clearing of the register to any desired value; and also provided with other clearing mechanism which is always effective, when enabled, to clear the register to zero. Control means including a manually operable key are provided to permit the operator to select either of the clearing mechanisms for use.

It is therefore a primary object of the invention to provide novel and improved resetting mechanism for a register.

It is a further object to enable a register having constant factor resetting mechanism to be cleared to zero without affecting the constant factor adjustment.

It is a further object to provide a register with alternatively operable resetting mechanisms respectively operable to clear the register to a constant factor or to zero.

The above and other objects, features, and advantages of the present invention will be more fully understood from the following specific description when considered in connection with the accompanying drawings.

In the drawings:

FIG. 1 is an enlarged vertical longitudinal section of a calculating machine constructed in accordance with

the invention showing a part of the fixed body portion of the machine and the carriage mounted thereon.

FIG. 2 is a fragmentary view showing a portion of FIG. 1 comprising a numeral wheel and the constant factor stop finger associated therewith in position for constant factor set-up.

FIG. 3 is a view similar to FIG. 2 showing the stop finger in its normally raised ineffective position.

FIG. 4 is a top plan view of the carriage showing the accumulator wheels and the associated resetting mechanism.

FIG. 5 is an exploded perspective view showing a single numeral wheel and associated resetting mechanisms.

For the purposes of the present disclosure, the invention is shown as embodied in a calculating machine of the type disclosed in the aforementioned Overbury Patent 1,995,434. To the extent practicable, parts of the instant machine which correspond to the parts of said patent will be similarly numbered, and reference is made to said patent for details of construction not described herein. It will of course be understood that the present disclosure is for illustrative purposes only, since the invention can be applied in varied specific forms and to other types of calculating machines.

Referring now to the drawings, wherein is shown a specific embodiment of the invention, the machine includes a fixed body portion **10** and a transversely shiftable carriage **2** mounted thereon. Supported in the carriage is an accumulator register comprising an ordinal series of numeral wheels **13**. Amounts set up on the differential actuator gears **5** by means of value keys **18** and selector bails **19** are entered through the intermediate gear train **12**, **12***a*, and numeral wheel pinion **13***a* positively or negatively in wheels **13** depending upon the direction of rotation of actuator shaft **4** and shaft **154** on which the tens transfer actuators **17** are mounted. The power drive (not shown) to actuator shaft **4** may be constructed in accordance with the disclosure of Chase Patent 1,566,650, issued December 22, 1925.

The numeral wheels **13**, with their attached pinions **13***a*, are loosely supported for rotation on an elongated shaft **86** which extends between the end plates of carriage **2** and is journalled for rotation therein. Fixed to shaft **86** is an ordinal series of collars **87** each provided with a rightwardly extending arm **85** urged in like direction by a spring **85***a*. The right-hand end of arm **85** is thus adapted to seat in any one (note FIG. 4) of an annular series of ten recesses **13***b* formed in the adjacent face of the next lower order pinion **13***a*, and thereby frictionally yieldably detent the associated numeral wheel in any of the latter's digital positions.

Associated with each numeral wheel is a resetting device in the form of an annular internally toothed ring **39** which is disposed within the cylindrical shell of the wheel and is rotatably supported on a circular flange **87***a* of the corresponding sleeve **87**. Annulus **39** is adjustably coupled to the wheel by a pair of diametrically opposed arms **40** mounted within the numeral wheel shell. As best seen in FIGS. 3 and 5, each arm **40** is pivotally mounted at one end on one of the pins **13***c* which serve to attach the pinion **13***a* to the numeral wheel. Arm **40** is bent adjacent its free end to form a V-shaped detent projection **40***a* adapted to yieldably engage the internal teeth **41** of ring **39** under the urge of a V-shaped compression spring **42** supported on another of pins **13***c*. Spring **42** bears at one end against the inner surface of the numeral wheel shell and at its other end extends through arm **40** and thereby biases the arm outwardly to yieldably couple the numeral wheel and resetting ring **39** for conjoint rotation.

To control resetting of the wheels, each ring **39** is provided with a lateral pin **90** fixed thereto and adapted

for cooperation with a related one of a plurality of stop fingers 89. Fingers 89 are rigidly fixed to a rock shaft 88 supported in the carriage 2.

To effect operation of the aforedescribed resetting mechanism there is provided a manually operable drive crank (not shown) rotatably supported at the right end of the carriage. As described in Patent 1,275,119, issued to F. S. Baldwin, August 6, 1918, the crank is coupled to shaft 86 through a unidirectional drive connection whereby operation of the crank will cause shaft 86 to rotate clockwise (viewed from the right side of the machine). Such rotation of shaft 86 will be transmitted through detent arms 85 to the numeral wheels and from the latter through coupling arms 40 to the resetting rings 39. The resetting rings will thus be rotated to a final predetermined angular rest position as determined by abutment of pins 90 with shoulders 89*a* of stop fingers 89. It should be noted that springs 42 and arms 40 are arranged to exert a larger coupling torque between the numeral wheels and resetting rings than the detenting torque exerted on the pinions 13*a* by arms 85. Accordingly, when any particular annulus 39 with its associated wheel 13 has reached reset position, continued rotation of shaft 86 will not affect the position of the wheel but will merely adjust arm 85 angularly relative to pinion 13*a*.

Rock shaft 88 is normally spring urged to the clockwise position shown in FIGS. 1, 3, and 5, with stop fingers 89 disposed above the path of pins 90. However, upon initiation of rotation of shaft 86 conventional means (not shown) constructed in accordance with the disclosure of the aforementioned Overbury patent is effective to rock shaft 88 counterclockwise and place fingers 89 in position to be engaged by pins 90.

Normally, the numeral wheels 13 stand in such angular relation to their resetting rings 39 as to register zero when the rings are in reset position. To set a constant factor value into any order of the register, this angular relation is adjusted to cause the wheel to register the constant factor value when the ring is in reset position. This adjustment is effected in the following manner.

Shaft 88 is adapted to be rocked counterclockwise to forward effective position by manual operation of a key 50 secured to its left end. The desired constant factor is first set up on keys 18. Then, with key 50 held forwardly to place stop fingers 89 in blocking relation with pins 90 as shown in FIG. 2, the machine is cycled to enter the value into the numeral wheels. During the cycle, the resetting rings 39 will be blocked against movement by fingers 89, while the coupling arms 40 will yield and ratchet past teeth 41 as the pinions 13*a* are power driven by the actuator gears 5 to the selected constant factor value. At the conclusion of the registering operation, therefore, the numeral wheels now stand adjusted to the constant factor and are coupled—by arms 40 engaging teeth 41—to the resetting rings 39 which still stand in reset or home position. Any subsequent resetting operation will accordingly be effective to restore the wheels not to zero but rather to the constant factor.

From the foregoing description it will be seen that if, during a series of calculations employing the set constant factor, it is desired to interject a calculation requiring clearing the register to zero, it would be necessary to first angularly adjust the wheels 13 relative to resetting rings 39 for zero clearing, and then following the calculation readjust the wheels to the constant factor.

In accordance with the present invention, I avoid these time-consuming steps by providing additional resetting means for the register wheels, said additional resetting means being operable to restore the wheels to unset or zero position. For this purpose a leftwardly extending resetting pin 60 is rigidly fixed to each pinion 13*a*. Each pin 60 is adapted for cooperation with a related one of a second series of stop fingers 61 fixed on the previously mentioned rock shaft 88 with the constant factor stop fingers 89. Like fingers 89, the zero stop fingers 61 are

normally disposed a slight distance above the cooperable resetting pins 90 and are rocked downwardly by counterclockwise movement of shaft 88 upon rotation of shaft 86.

Either set of stop fingers—61 or 89—is adapted to be selectively enabled for operation under the control of the operator, as follows. Rock shaft 88 is slidably supported in carriage 2 for limited longitudinal shifting movement relative thereto. A stop collar 62 fixed to the left end of the shaft serves to limit shifting movement thereof in either direction by engagement with one or the other of two spaced adjacent framing plates 2*a*, 2*b* of the carriage. As shown in full lines in FIG. 4, when shaft 88 is in leftmost position the constant factor stop fingers 89 lie in registration with the cooperating resetting pins 90 while the zero stop fingers 61 are disposed to the left of pins 60. However, as indicated by the broken line showing of FIG. 4, movement of the shaft to its rightmost position will bring fingers 61 into the plane of pins 60 and will place fingers 89 in ineffective position to the right of pins 90.

Shaft 88 is adapted to be moved between its two positions of longitudinal adjustment by grasping key 50 fixed thereto and manually moving it in the desired direction. Suitable detent means (not shown) may be provided to releasably maintain the shaft locked in either of its shifted positions.

It is believed that operation of the present invention will now be obvious in light of the foregoing description. For set-up of a constant factor and subsequent clearing thereto, shaft 88 is positioned to the left whereby the stop fingers 89 are enabled and the stop fingers 61 are disabled. If the operator should at any time desire to clear numeral wheels 13 to zero but still retain the constant factor, key 50 is manipulated to shift shaft 88 to the right thereby enabling stop fingers 61 and disabling fingers 89. Operation of the clearing mechanism will now be effective to clear wheels 13 to zero without affecting the constant factor angular adjustment between the wheels and resetting rings 39.

While there have been shown and described and pointed out the novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

I claim:

1. In a calculating machine having a register comprising an ordinal series of numeral wheels: first resetting mechanism for each of said wheels comprising a resetting device for said wheel, means for coupling said wheel and said device for simultaneous rotation and permitting angular adjustment therebetween, and first control means for controlling restoration of said device to a predetermined angular position; second resetting mechanism for each of said wheels comprising a resetting member coupled to said wheel in fixed angular relation therewith, and second control means for controlling restoration of said member to a predetermined angular position corresponding to zero registering position of said wheel; and means for selectively enabling said first or second resetting mechanism.

2. The invention according to claim 1, said first and second control means comprising respective first and second control members mounted for joint adjustment to positions wherein one of said members is enabled and the other disabled and vice versa, said enabling means being operable to control said adjustment.

3. The invention according to claim 2, wherein said first control member is disposed to one side of its associated numeral wheel and said second control member is disposed to the opposite side of said associated numeral wheel.

4. The invention according to claim 2, wherein all said first and second control members are mounted on a single ordinally extending support member, each of said first control members being disposed to one side of their respective associated numeral wheels and each of said second control members being disposed to the opposite side of said associated numeral wheels.

5. The invention according to claim 1, said first and second control means comprising respective first and second control members, an ordinally extending support member mounted adjacent said register for ordinally directed shifting movement between a first and a second position, all said first and second control members being mounted on said ordinally extending support member for movement therewith, each of said first control members being disposed to one side of their respective associated numeral wheels and each of said second control members

being disposed to the opposite side of said associated numeral wheels, said first control members being enabled and said second control members disabled in said first position of said support member, said first control members being disabled and said second control members enabled in said second position of said support member, said enabling means being operable to control the shifted position of said support member.

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