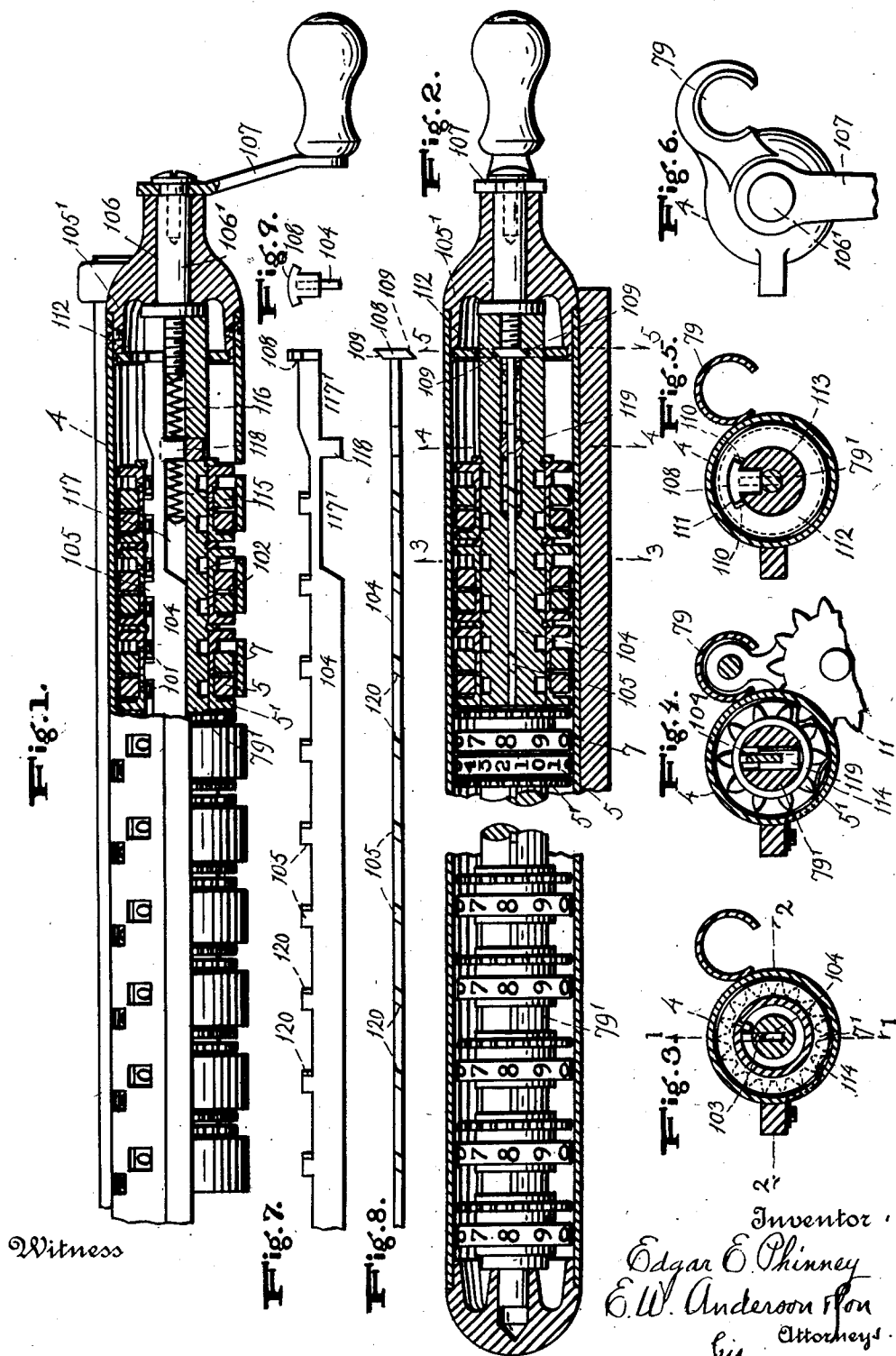


E. E. PHINNEY.
 ZERO SETTING MECHANISM FOR CALCULATING MACHINES.
 APPLICATION FILED MAR. 8, 1917. RENEWED AUG. 4, 1919.

1,330,653.

Patented Feb. 10, 1920.



Witness

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UNITED STATES PATENT OFFICE.

EDGAR E. PHINNEY, OF NEW YORK, N. Y., ASSIGNOR TO MONROE CALCULATING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ZERO-SETTING MECHANISM FOR CALCULATING-MACHINES.

1,330,653.

Specification of Letters Patent.

Patented Feb. 10, 1920.

Application filed March 8, 1917, Serial No. 153,366. Renewed August 4, 1919. Serial No. 315,344.

To all whom it may concern:

Be it known that I, EDGAR E. PHINNEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made a certain new and useful Invention in Zero-Setting Mechanism for Calculating-Machines, of which the following is a specification.

Figure 1 is a plan view partly in section on the line 1—1, Fig. 3, parts being broken away.

Fig. 2 is a section on the line 2—2, Fig. 3, parts being broken away.

Fig. 3 is a section on the line 3—3, Fig. 2.

Fig. 4 is a section on the line 4—4, Fig. 2.

Fig. 5 is a section on the line 5—5, Fig. 2.

Fig. 6 is an end view of the carriage.

Fig. 7 is a detail side view of the endwise movable bar.

Fig. 8 is a plan view of the same.

Fig. 9 is a detail end view of the same.

The invention has relation to zero-setting means for calculating and other machines, having for its object the provision of means for setting back to zero two alined series of registering dials or wheels located upon the same shaft; a further object being to provide means having a single operating device for the purpose stated; a further object being to provide means for the purpose stated located axially of a series of registering dials or wheels. Other objects and advantages will hereinafter appear.

The invention consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings, illustrating the invention, as applied to the calculating machine of my application for patent Serial No. 142,190, filed January 13, 1917, the numeral 4 designates an endwise-shiftable carriage, pivoted in rear at 79 and having a shaft 79' bearing a series of numeral dials or wheels 5, whereon is registered the result of the calculation, said wheels having each an attached gear wheel 5', normally in engagement with underlying gear wheels 11 of the casing.

A second series of numeral wheels or dials 7 is located also upon shaft 79', the members of said second series alternating with the members of the series 5, and being actuated to show the quotient in division and the multiplier in multiplication. The actuation

of the dials 5 and 7 is described in my co-pending application, above referred to.

The dial wheels 5 and 7 are provided each with an inner radial pin 101, working in an annular groove 102 of the shaft 79'. Located and movable endwise within a longitudinal radial slot 103 of said shaft is a bar 104, provided upon one longitudinal edge thereof with a series of short projections 105, corresponding in number to the number of the dial wheels 5 and normally out of register with the annular grooves 102 of the shaft, said projections being located midway between the pins 101 of the two series of wheels 5 and 7, so that upon movement of said bar endwise in one direction said projections will be brought into line with said pins of one series of the dial wheels, as 5, and upon movement of said bar endwise in the opposite direction said projections will be brought into line with said pins of the other series of dial wheels, as 7.

The tubular carriage is provided at one end with a cover or plug 105', rigidly secured thereto and having a central perforation 106 wherein bears a stud shaft 106', said stud shaft being rigidly secured to the shaft 79', of which it is an extension, and being provided with a crank handle 107.

The bar 104 is provided at one end with opposite lateral projections 108, forming a head having beveled free ends 109, adapted for engagement with the similarly beveled ends 110 of an eccentric opening 111 engaged by said head and located in a plate 112, carried by the plug 105', the shaft 79' having engagement with a central perforation 113 of said plate. The bar 104, having the beveled head 108, and the plate 112, having the opening provided with beveled walls engaged by said head, serve to normally, or while the numeral wheels are being actuated in the performance of the calculation, hold the shaft 79' against rotation.

Upon rotation of the operating crank 107 in one direction, as to the right or clockwise, the shaft 79' and the bar 104 will be rotated in the same direction, the engagement of the beveled ends of the head 108 of said bar with the beveled surfaces of the opening of the stationary plate 112 causing endwise movement of said bar in a direction toward the operating handle, the pro-

jections 105 of said bar being at the same time moved into alinement with the grooves 102 of the shaft wherein are located the inner pins 101 of the dial wheels 5, so that, upon continued movement of said handle and of the bar (the dial wheels 5 and 7 being held stationary by springs 114) said projections will engage with the inner pins 101 of the dial wheels and turn said wheels back to zero position.

Upon rotation of the operating crank in the opposite direction, or counter-clockwise, the bar 104 will be rotated therewith, the engagement of the beveled ends of the head 108 with the beveled surfaces 110 causing endwise movement of said bar in a direction away from the operating handle, the projections 105 being at the same time moved into alinement with the grooves 102 of the shaft wherein are located the inner pins of the other series of dial wheels, 7, and continued movement of the handle causing the wheels 7 to be set back to zero position.

In the endwise movement of the bar 104 in either direction, the head 108 thereof will be brought to one side or the other of the stationary plate 112, and in the continued movement of the shaft and bar said head will be prevented by the interference of said plate from movement back to normal position until the complete rotation of the shaft has been accomplished, when the head will be brought again into line with the opening 111 of said plate, and the bar will be returned to normal position by a coiled spring, 115 or 116, according to the direction of movement of said bar; said springs located centrally of the shaft 79', within a seat 117 thereof and a recess 117' of the bar, and bearing at their opposing ends against an inner projection 118 of the bar and at their other ends against the end walls of the shaft seat. The movement of the members of either series of dial wheels 5 or 7 back to zero position is accomplished in one complete rotation of the crank handle in the proper direction.

A split plug 119 is located within a radial recess of the shaft, midway between the springs 115 and 116, the inner projections 118 of the bar 104 being of slightly less breadth than and engaging between the bifurcations of said plug, and being movable with said bar to one side or the other of the plug, to compress either of said springs for the purpose stated.

At the end of the return movement of the bar, brought about by the action of the spring compressed, the inner projection 118 of the bar will lie entirely between the bifurcations of the plug, and the spring then bearing against the plug alone, the pressure thereof being removed from the bar, said bar will be brought accurately to a stop

with its projections 105 midway between the inner pins of the two series of dial wheels.

The shaft 79', bearing the numeral wheels, is normally checked from rotation in either direction by engagement of the beveled head 108 of the bar 104 with the beveled walls of the opening of the plate 112, and is further checked by the springs 115 and 116, one of which must be compressed by movement endwise of said bar before the said shaft can be rotated.

The projections 105 of the bar 104 are provided with inclined transverse edge walls 120, said walls serving to engage and move out of the path thereof, in the endwise movement of said bar, any of the inner pins 101 of the registering or numeral wheels that may be in line therewith.

I claim:

1. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, and means rotating with the shaft and adapted to engage selectively either series to set the wheels thereof back to zero position.
2. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, and means rotating with the shaft and adapted to selectively engage the wheels of one series only upon rotation of the shaft in one direction and with the wheels of the other series only upon rotation of the shaft in the opposite direction, to set the wheels back to zero position.
3. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, means rotating with the shaft and adapted to engage selectively either series to set the wheels thereof back to zero position, and means cooperating with the last named means for normally holding said shaft against rotation.
4. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, means for normally holding said shaft against rotation including a slide movable endwise in either direction, rotatable with said shaft and capable of engagement selectively with either series to set the wheels thereof back to zero position.
5. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, means movable endwise in either direction, rotatable with said shaft and capable of engagement selectively with either series to set the wheels thereof back to zero position.
6. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon the shaft, means movable endwise in either direction, rotatable with the shaft and capable of en-

gement selectively with either series to set the wheels thereof back to zero position, and means for accomplishing the endwise movement of the last named means at the start of the rotation of the shaft in either direction.

7. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon the shaft, and means movable endwise in either direction, located axially of said wheels and rotatable with said shaft and capable of engagement selectively with either series to set the wheels thereof back to zero position.

8. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon said shaft, the members of both series of wheels having inner pins, and means movable endwise in either direction and having projections capable of engagement selectively with the inner pins of either series of wheels to set said wheels back to zero position.

9. In zero-setting mechanism, a shaft, a series of numeral wheels thereon, a second series of numeral wheels upon the shaft, a member movable endwise in either direction, rotating with said shaft and capable of engaging selectively either series to set the wheels thereof back to zero position, means for accomplishing the endwise movement of the member at the start of the rotation of

said shaft in either direction and for holding said member in position as actuated in either direction throughout the rotation of said shaft, and spring means for returning said member to normal position at the completion of the shaft rotation.

10. In zero-setting mechanism, a casing, a shaft having bearings therein, a series of numeral wheels upon said shaft, a second series of numeral wheels upon said shaft, means for normally holding said shaft against rotation including a bar seated in and rotatable with said shaft and adapted to engage selectively either series to set the wheels thereof back to zero position, said bar having a beveled head and said casing having a beveled plate engaging said head to move said bar endwise in either direction at the start of the rotation of the shaft in either direction and to hold said bar in position as actuated in either direction throughout the rotation of said shaft, and spring means for returning said bar to normal position at the completion of the shaft rotation.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR E. PHINNEY.

Witnesses:

L. D. TAGGART,
P. F. HARNETT.