J. BALLOU.

CALCULATOR.

No. 27,418. Patented Mar. 13, 1860.

Fig. 3.

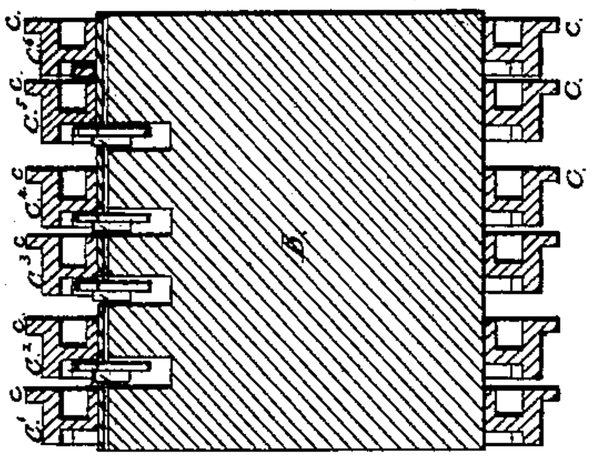


Fig. 5.

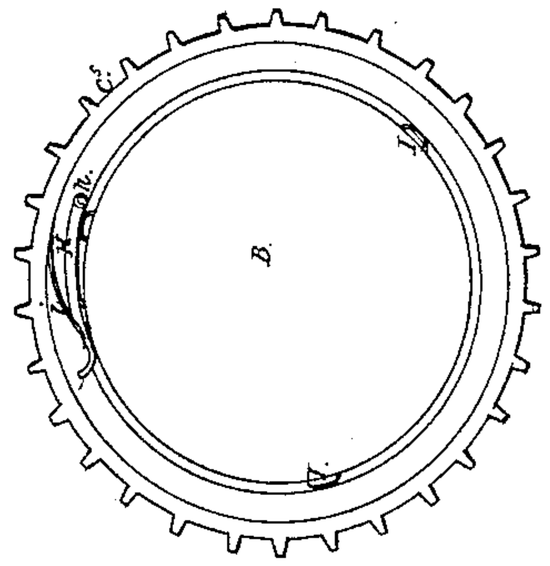


Fig. 2.

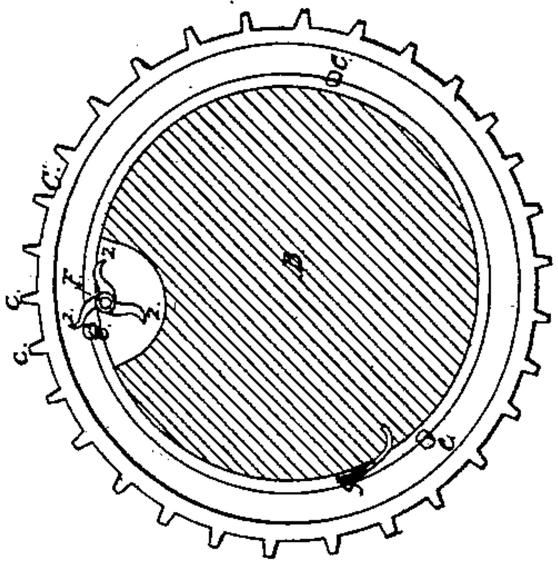


Fig. 4.

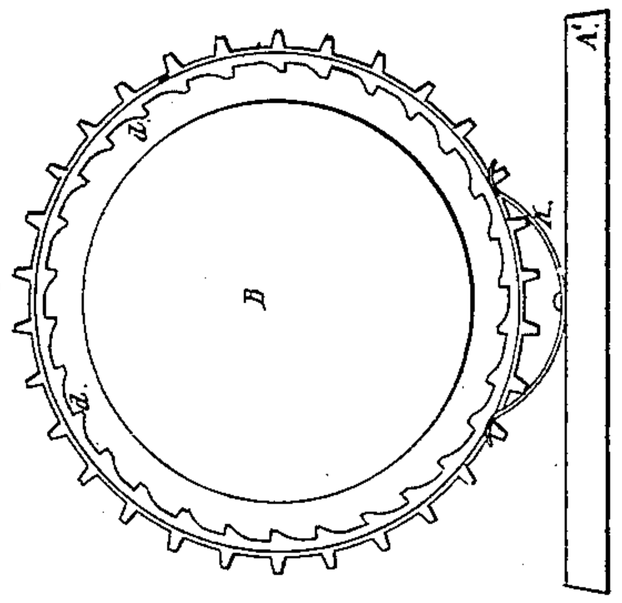
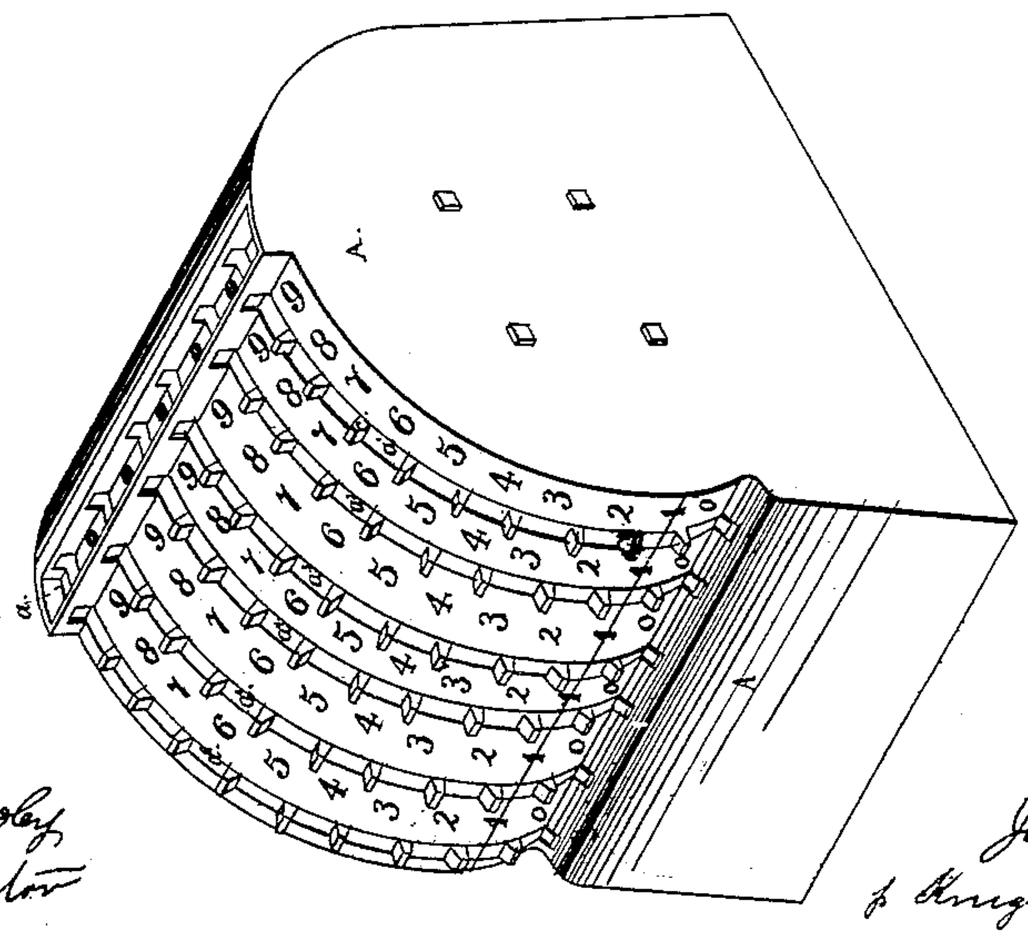


Fig. 1.



Witnesses:

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by Knight Brothers Attys

UNITED STATES PATENT OFFICE.

JOHN BALLOU, OF CINCINNATI, OHIO.

ADDING-MACHINE.

Specification of Letters Patent No. 27,418, dated March 13, 1860.

To all whom it may concern:

Be it known that I, JOHN BALLOU, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Calculators; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a perspective view of the machine. Fig. 2, is a transverse section of the stationary shaft at *x x* Fig. 1—showing in elevation the left side of one of the rings. Fig. 3, is a longitudinal section of the shaft and rings in their relative position looking from the rear. Fig. 4, is an elevation of the right side of one of the rings in position upon the shaft. Fig. 5, is a similar view of the left side exhibiting a modification in the shifting device.

The said invention relates to a peculiar construction of rings in which are combined the three features of finger wheel, ratchet and register.

A, is the exterior casing, the front or face of which has the form of a segment of a horizontal cylinder with a series of equi-distant latitudinal slots a^1, a^2, a^3, &c., and is marked with numerals from 0 to 9 reading upward. The said casing is also provided at top with a longitudinal slot *a*.

B, is a shaft fixed concentrically within the casing A.

C^1, C^2, C^3, &c., are a series of rings fitted loosely upon the shaft B, and marked around their peripheries with numerals corresponding in distance with those on the exterior casing.

c are teeth upon the peripheries of the rings, which teeth also correspond in distance with the numerals and project through the slots a^1, a^2, &c., so as to constitute the means of operating the machine as will be hereinafter more fully explained. The said rings are also provided on their right sides with equi-distant ratchet teeth *d*, projecting inward as seen in Fig. 4, and on their left sides with one tenth of the number of longitudinal pins or projections *e*, Fig. 2.

F, is one of a series of "shifters" pivoted in cavities in the shaft B, as seen in Fig. 2, and occupying a space between the rings. Teeth 1 on the side of the shifter are acted upon by the pins *e* and the teeth 2 engage with the teeth *d*, of the adjacent wheel.

g, is a friction spring which while one of the pins *e*, is operating the shifter, engages with another of the said pins so as to prevent the unsteady or too sudden motion of the ring.

In the modification shown in Fig. 5, H represents a pawl pivoted at *h*, to the left side of the ring and projecting under the right side of the succeeding ring. I, I, are staples projecting from the periphery of the shaft, in passing over which the pawl H, is elevated so as to cause its upturned end to engage with the teeth *d*, of the adjacent ring. At other times the pawl H, is kept down upon the periphery of the shaft by the pressure of a spring *i*. K are friction springs attached to the bottom of the casing A^1 and pressing against the peripheries of the rings to prevent their too free motion.

The operation is as follows: The rings are first adjusted so as to present only ciphers through the slot *a*. The finger is then placed upon the tooth *c* opposite the number desired to be added and upon the said tooth being brought down to the cipher on the casing, a corresponding number will appear through the slot *a*, and upon the operation being repeated a number equal to the sum of both will appear through the said slot, and so on. Upon the figure 9 appearing through the aperture *a*, the shifter F or H, engages with the next ring to the left in manner previously described, so that upon the withdrawal of the said figure 9 by the continuous motion of the ring upon which it is marked, the adjacent ring is moved the distance of one figure so as to present the next highest number.

In adding numbers consisting of several columns of figures the right hand wheel is of course operated for units, the next for tens, and so on, so that the operation may be either from right to left or from left to right, as many columns being taken up at once as there are rings.

What I claim as new and of my invention herein, and desire to secure by Letters Patent, is—

The construction of the rings C^1, C^2, C^3, &c., marked on their peripheries with numerals substantially as and for the purposes set forth.

In testimony of which invention, I hereunto set my hand.

JOHN BALLOU.

Witnesses:
N. A. THOMPSON,
JOHN MCCLELLAN.