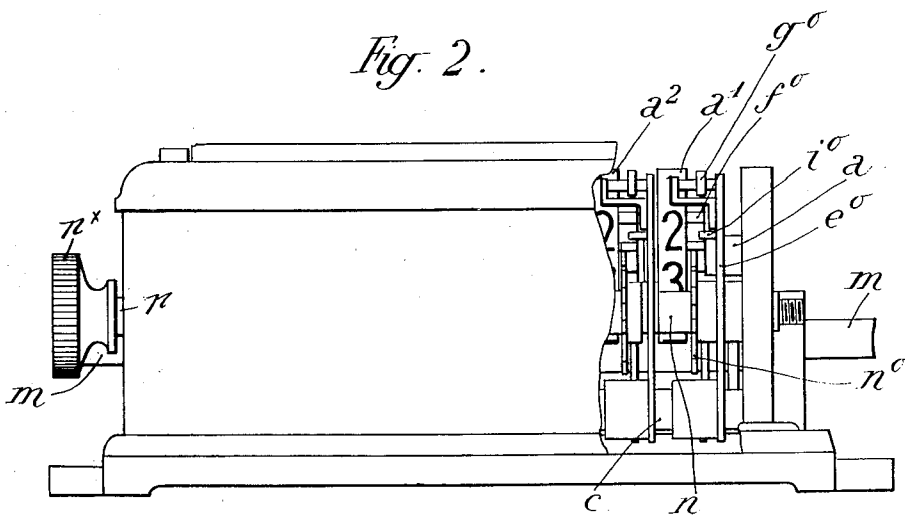
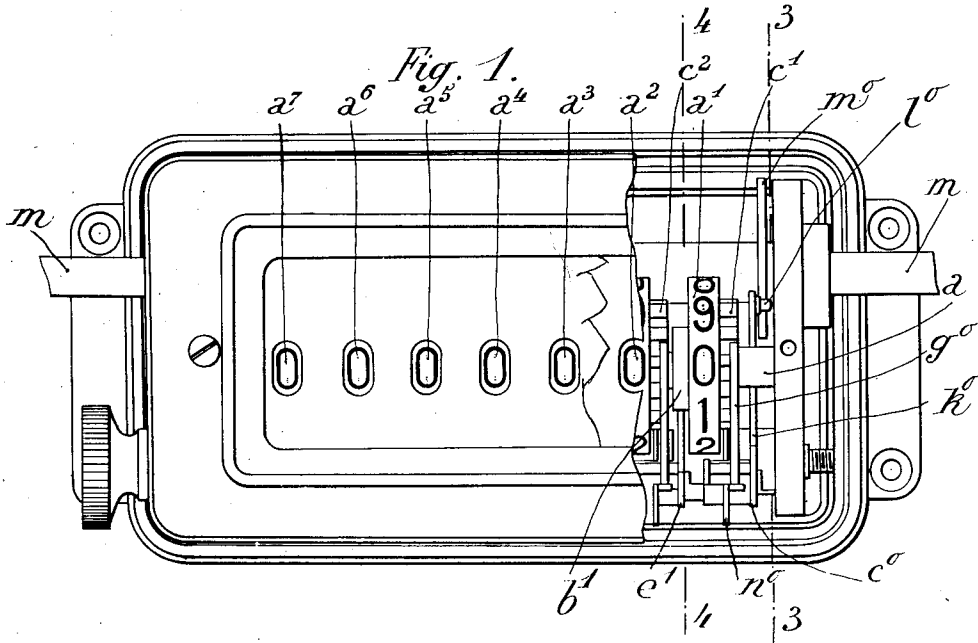


R. B. A. LEMAIGNEN.
 ZEROIZING MECHANISM.
 APPLICATION FILED APR. 19, 1909.

997,068.

Patented July 4, 1911.

3 SHEETS—SHEET 1.



Witnesses:

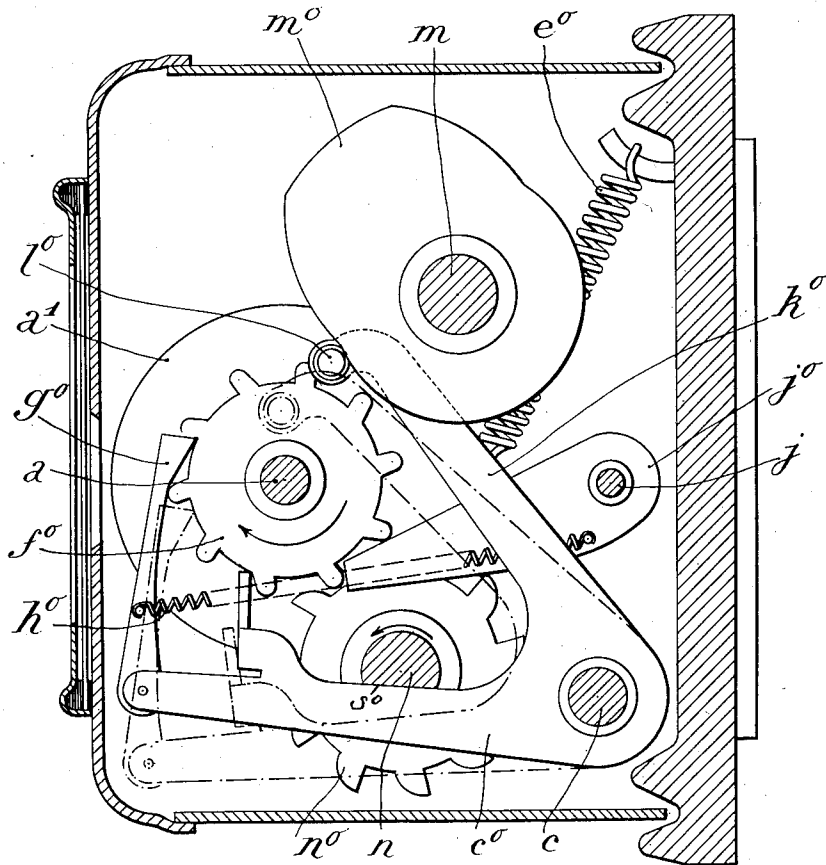
[Handwritten signatures of witnesses]

Inventor
 Robert B. A. Lemaigen

[Handwritten signature of James L. Norris]
 James L. Norris

[Handwritten signature]
 Atty.

Fig. 3.



Witnesses

[Handwritten signatures of witnesses]

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James L. Norris

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3 SHEETS—SHEET 3.

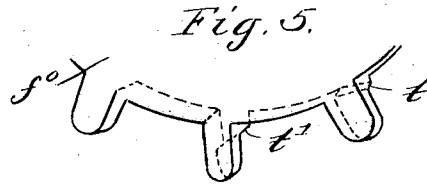
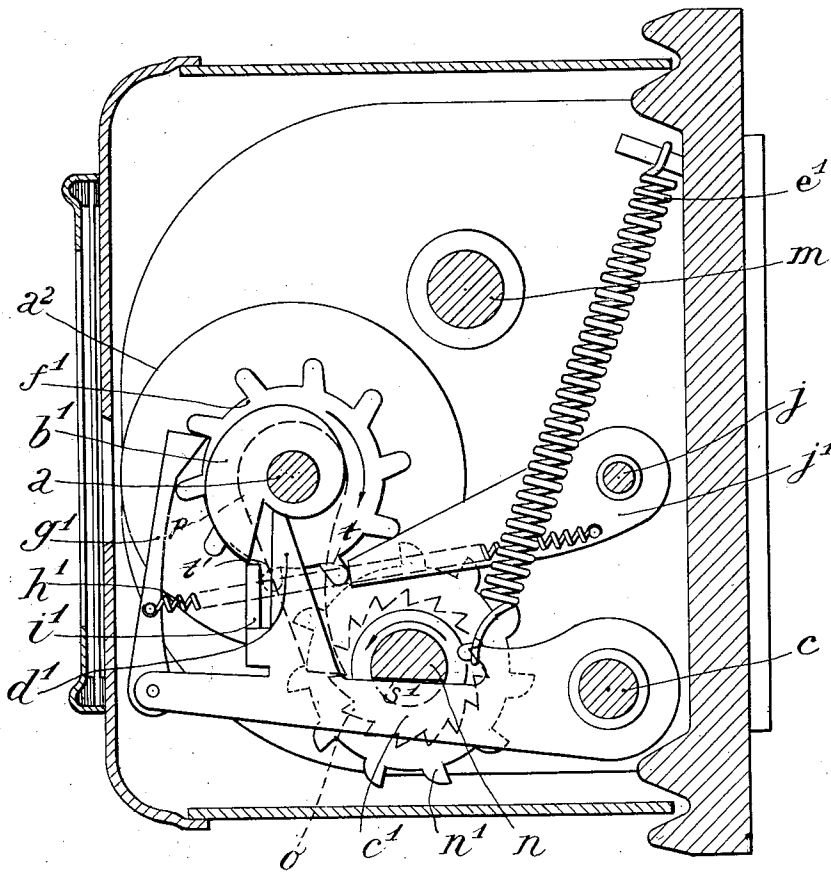


Fig. 4.



Witnesses:

[Handwritten signatures of witnesses]

Inventor

Robert B. A. Lemaiguen

[Handwritten initials]

James K. Norris

[Handwritten signature]

UNITED STATES PATENT OFFICE.

ROBERT BERTIN AUGUSTE LEMAIGNEN, OF ROUEN, FRANCE.

ZEROIZING MECHANISM.

997,068.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed April 19, 1909. Serial No. 490,931.

To all whom it may concern:

Be it known that I, ROBERT BERTIN AUGUSTE LEMAIGNEN, a French citizen, residing at Rouen, Seine-Inferieure, France, have invented a certain new and useful Zeroizing Mechanism, of which the following is a specification.

A very large number of zeroizing mechanisms have been designed, but none of them fulfils all the requirements. Among other disadvantages they have that of not being sufficiently simple to manipulate and of making fraud possible, more particularly in meters or counters which are provided with them. The present invention however obviates the above-mentioned disadvantages. Its characteristic features are: that it acts positively on the drums of the machine to which it is applied, so as to bring them positively to zero; that it drives the drums not backward as usual, but, on the contrary, forward; that it merely requires a movement of a given amplitude, always the same, of its operative part, for fulfilling entirely its function; and also that the moment its movement is started, it stops the machine in question by completely withdrawing it from any possibility of fraud and releasing it only after its movement has been completed, and the drums returned to zero.

The invention is designed for employment in connection with a counting machine or meter, as will be obvious, and primarily for a counting machine of the type shown and described in my co-pending application, Serial No. 490,930, filed of even date with this application.

In the accompanying drawings, the zeroizing mechanism is shown as applied to such a counter or meter, and therein: Figure 1 is a front elevation, with parts removed, of the complete invention. Fig. 2 is a corresponding plan view. Figs. 3 and 4 are enlarged cross sections taken, respectively, on the lines 3-3 and 4-4 of Fig. 1. Fig. 5 is a fragmental perspective view of one of the main ratchets, showing the mutilation of the teeth.

The counter illustrated in said drawings is, as already stated, of the type shown and described in the application above identified, to which reference may be had for an extended description of the construction thereof. The essential parts of this counter, so far as the present invention is concerned, are the shaft or spindle a on which the number-

ing wheels a^1-a^7 are mounted, a cam shaft m provided with a cam m^0 for actuating the first of a series of levers c^0-c^6 carried by a shaft c , and a series of spring-pressed pawls g^0-g^6 . The remaining parts of the counter relate solely to the driving of the numbering wheels, and for this reason have no direct bearing upon this invention.

To the right hand faces of the numbering wheels there is rigidly connected in any suitable manner a series of ratchets f^0-f^6 , each of which has two successive teeth thereof mutilated, as shown in Fig. 5, the mutilations being in the nature of recesses which are formed preferably by milling cutters. These teeth are indicated by the reference letters t and t^1 in the figure mentioned, and their position with respect to their particular numbering wheel is such that they are disposed slightly behind or to the rear of the 0 (zero) marked on said wheel. The ratchets f^0-f^6 are operated by the pawls g^0-g^6 , as in the construction set forth in the companion application.

The mechanism for zero-setting the aforementioned ratchets comprises a corresponding number or series of ratchets n^0-n^6 keyed to a shaft n having one end thereof projecting exteriorly of the casing of the counter and provided with an operating head or handle n^* . Intermediate the ratchets there is formed in shaft n a series of transverse peripheral recesses or seats s^0-s^6 , which lie directly above and normally receive the upper edges of the levers c^0-c^6 , (see Figs. 3 and 4), the bottom walls of said seats being flat. The ratchets n^0-n^6 are of slightly greater diameter than the ratchets f^0-f^6 , and have the same number of teeth as the latter, but the arrangement of these teeth is such that a blank or interval of a double tooth space is present. These blank spaces or intervals, when the ratchets n^0-n^6 are in normal position, are intersected, practically at their centers by the planes passing through the geometrical axes of the shafts a and n .

The pawls g^0-g^6 are drawn toward their respective ratchets f^0-f^6 , by the springs h^0-h^6 , and the levers c^0-c^6 are in like manner drawn toward shaft n by the springs e^0-e^6 , said levers being provided with upright fingers d^1-d^6 which lie in the planes of and directly beneath the spiral cams b^1-b^6 secured to the left hand faces of the ratchets f^0-f^6 .

To zero-set the numbering wheels $a^1—a^6$, it is only necessary to turn the shaft n through one complete revolution in a counterclockwise direction by means of its head n^x . During this rotation, the several levers $c^0—c^6$ will be depressed by the cam action of said shaft due to the formation of the seats $s^0—s^6$, and at the same time said levers will carry the pawls $g^0—g^6$ downwardly with them. The ratchets $n^0—n^6$ will rotate with shaft n and, in consequence, will rotate the ratchets $f^0—f^6$ until the latter almost reach the zero position. At this time, the mutilated teeth t, t^1 are directly adjacent the teeth of the ratchets $n^0—n^6$, and by reason of their peculiar mutilation permit said ratchets $n^0—n^6$ to complete their revolution without affecting the ratchets $f^0—f^6$, the diameter of the milling cutter employed to form the recesses or mutilations being the same as that of the ratchets $n^0—n^6$. The rotation of the ratchets $n^0—n^6$ thus serves to bring the ratchets $f^0—f^6$ into the afore-mentioned position, irrespective of their position at the commencement of such rotation, said ratchets $f^0—f^6$ reaching that position more or less quickly, according to their initial position.

At the completion of revolution of shaft n , the first seat s^0 thereon will be brought into alinement with the first lever c^0 , whereupon the latter will be free to move upwardly under the influence of its spring e^0 into said seat. When this movement takes place, the pawl g^0 will likewise move upwardly, thereby rotating the ratchet f^0 and with it wheel a^1 into a position wherein the zero on said wheel is visible through the sight opening in the front of the casing. As wheel a^1 rotates, it turns with it cam b^1 , which thus releases finger d^1 provided upon lever c^1 , the latter rising slightly through the medium of its spring e^1 and actuating the second ratchet f^1 by means of its pawl g^1 . In the same manner the remaining wheel ratchets will be actuated, thereby setting the corresponding wheels at zero.

The operation is similar in the main to that above described where the driving cam m^0 is dispensed with and the successive actuation of the wheels $a^2—a^7$ is not effected by means of spiral cams, and fingers associated with the same. In that case, the return movement of all the levers will be simultaneous, or virtually so, when the revolution of the actuating shaft n is completed.

In order to prevent any partial manipulation of the zero-setting mechanism and the temporary release of any of the numbering wheels, there is provided a pawl p , which is carried by the shaft a , and a ratchet o keyed to shaft n , the arrangement being obviously such that backward rotation of the latter shaft is precluded. As a matter of fact, moreover, such backward rotation is

possible in any instance only so long as none of the ratchets keyed to shaft n has come into engagement with the non-recessed teeth of the ratchets which control the numbering wheels.

The invention is not intended to be limited to the exact details of construction shown and described, as modifications and changes may obviously be made within the scope of the appended claims. For instance, where the numbering wheels have a large number of figures inscribed thereon, it may be necessary to effect the return movement of the levers not after a single revolution of the spindle n , but after several revolutions thereof, this result being obtained by modifying the proportions of the two sets of ratchets. Also, it will be understood that the invention is susceptible of application with equal facility to other types of counter machines of different types, as well.

I claim as my invention:

1. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a driven member secured to each wheel; of means engaged with said members for rotating the same to partially zero-set the corresponding wheels; and additional means arranged to engage and rotate said members at the conclusion of the first rotation thereof for completing the zero-setting of said wheels.

2. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a driven member secured to each wheel; of an operating member; a series of driving members carried by said operating member and engaged with the corresponding driven members, for driving the latter when the former is operated, to partially zero-set said wheels; and an additional series of driving members arranged to engage said driven members at the conclusion of the first movement thereof, for completing the zero-setting of said wheels.

3. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a ratchet secured to each wheel; of means engaged with said ratchets for rotating the same, to partially zero-set said wheels; and additional means arranged to engage and rotate said ratchets at the conclusion of the first rotation thereof for completing the zero-setting of said wheels.

4. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a ratchet secured to each wheel; of rotating members engaged with said ratchets for partially zero-setting said wheels; and rocking members arranged to engage said ratchets at the conclusion of the rotation of the first-named members, for completing the zero-setting of said wheels.

5. In a calculating machine, the combina-

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tion, with a series of numbering wheels, their shaft, and a ratchet secured to each wheel; of an operating shaft; a series of members carried thereby and engaged with
 5 said ratchets for partially zero-setting said wheels; and a separate series of members controlled by the operation of said shaft and arranged to engage said ratchets at the conclusion of the operation of the first-named
 10 members for completing the zero-setting of said wheels.

6. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of an operating shaft; means
 15 carried by said shaft for partially zero-setting said wheels; and a series of rocking members for completing the zero-setting of said wheels, said members being arranged for depression by said shaft during the partial zero-setting.
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7. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of an operating shaft provided with a series of cams; means carried by said
 25 shaft for partially zero-setting said wheels; and a series of rocking members for completing the zero-setting, said members being arranged for depression by the cams during the partial zero-setting.

8. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a driven member secured to each wheel; of means engaged with said
 30 members for imparting thereto rotary movements of varying amplitude, to partially zero-set said wheels; and additional means arranged for subsequent engagement with said members to impart thereto a rotary
 35 movement of constant amplitude to complete the zero-setting of said wheels.
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9. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a driven member secured to each wheel; of a series of driving members
 45 engaged with said driven members for rotating the same, to partially zero-set said wheels, one series of members being mutilated in part, to terminate such rotation at a predetermined point; and an additional series of driving members arranged to engage
 50 and rotate said driven members at the termination of the first rotation, to complete the zero-setting of said wheels.

10. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a toothed driven member secured to each wheel; of a series of toothed driving members engaged with said driven
 55 members, for rotating the same, to partially zero-set said wheels, each driven member having certain of its teeth mutilated to terminate such rotation at a predetermined point; and an additional series of driving
 60 members arranged to engage and rotate said driven members at the termination of the

first rotation, to complete the zero-setting of said wheels.

11. In a calculating machine, the combination, with a series of numbering wheels, their shaft, and a ratchet secured to each wheel; of a series of ratchets engaged with the first-named ratchets, for rotating the same, to partially zero-set said wheels, each of said first-named ratchets having certain of its
 70 teeth mutilated, to terminate such rotation at a predetermined point; and an additional series of members arranged to engage and rotate said first-named ratchets at the termination of the first rotation, to complete the zero-setting of said wheels.
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12. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of an operating member; means connected directly thereto for partially zero-setting said wheels when said member is actuated; and additional means controlled by the actuation of said member for completing the zero-setting when such actuation is terminated.
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13. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of an operating member; means connected directly thereto for partially zero-setting said wheels when said member is actuated; and a series of levers arranged for
 90 engagement with said member for completing the zero-setting when the actuation of the latter is terminated.
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14. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of an operating shaft; means carried by the second-named shaft and rotatable with the same for rotating
 100 said wheels, to partially zero-set the same; a series of rocking members operated by said second-named shaft; and means carried by said members for rotating said wheels at the conclusion of their first rotation, to complete the zero-setting.
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15. In a calculating machine, the combination, with a series of numbering wheels and their shaft; of a series of simultaneously rotating devices for rotating said wheels, to partially zero-set the same; and a series of successively-operating devices for rotating
 110 said wheels at the conclusion of the first rotation, to complete the zero-setting.
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16. In a calculating machine, the combination, with a shaft, a series of numbering wheels mounted thereon, and a ratchet rigidly connected to each wheel; of an operating shaft; a series of ratchets mounted on the second-named shaft, and arranged to engage and rotate the first-named ratchets, to partially zero-set the wheels; a series of
 120 rocking levers controlled by the rotation of the second-named shaft; and a series of pawls carried by said levers and arranged to engage and rotate the first-named ratchets during the movement of the levers in one
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direction, to complete the zero-setting of said wheels.

17. In a calculating machine, the combination, with a shaft, a series of numbering wheels mounted thereon, and a ratchet rigidly connected to each wheel; of an operating shaft; a series of ratchets mounted on the second-named shaft, and arranged to engage and rotate the first-named ratchets, to partially zero-set the wheels; means for holding the second-named shaft against backward rotation; and a series of members

controlled by the rotation of said second-named shaft and arranged to rotate the first-named ratchets at the conclusion of the first rotation thereof, to complete the zero-setting of said wheels. 15

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT BERTIN AUGUSTE LEMAIGNEN.

Witnesses:

CHARLES WEISMANN,
H. C. COXE.