(No Model.)

W. F. LAMB.

CASH REGISTER.

No. 456,220. Patented July 21, 1891.

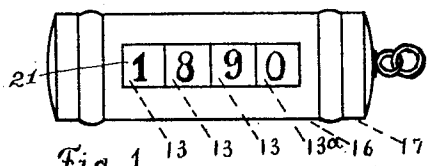

Fig. 1.

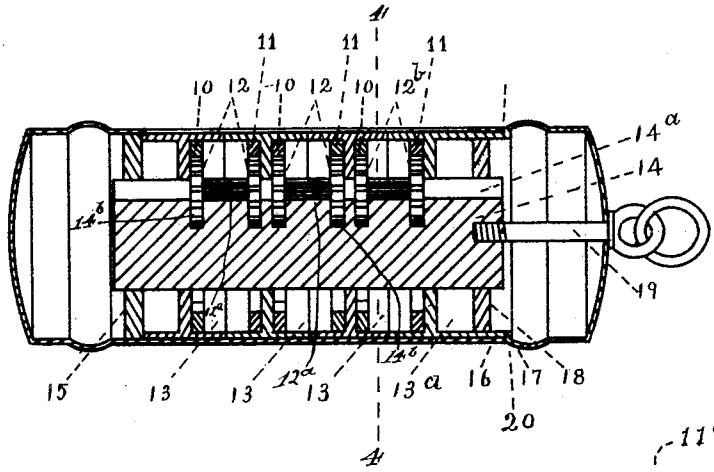

Fig. 2.

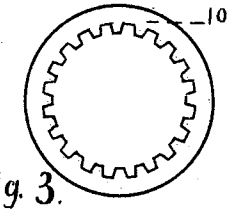

Fig. 3.

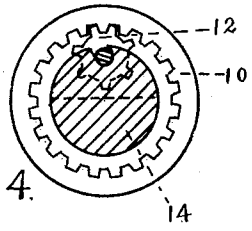

Fig. 4.

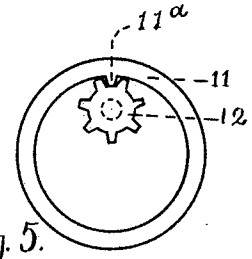

Fig. 5.

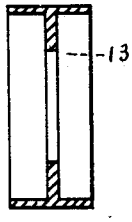

Fig. 6.

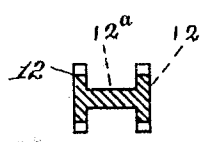

Fig. 7.

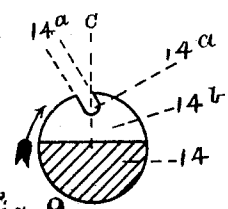

Fig. 9.

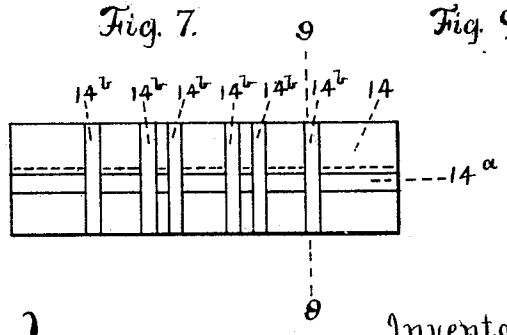

Fig. 8.

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CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 456,220, dated July 21, 1891.

Application filed April 11, 1890. Serial No. 347,570. (No model.)

To all whom it may concern:

Be it known that I, WATSON F. LAMB, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Cash-Register, of which the following is a specification.

My invention relates to improvements in cash-registers in which a series of number-wheels are arranged within a slotted cylindrical case; and the objects of my invention are to provide operating mechanism positive in its action, and which cannot be disarranged by turning the instrument backward. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of the instrument in working order. Fig. 2 is a longitudinal section. Fig. 3 is a view of one of a series of internal gears 10. Fig. 4 is a transverse section of the instrument on line 4 4. (See Fig. 2.) Fig. 5 is a view of one of a series of annular driving-wheels 11 and double pinions 12. Fig. 6 is a section of one of a series of number-wheels 13. Fig. 7 is a view of one of a series of double pinions 12. Fig. 8 is a plan view of central spindle 14, showing the longitudinal undercut journal-bearing groove 14^a and the transverse pinion-grooves 14^b. Fig. 9 is a sectional view of said spindle 14 on line 9 9. (See Fig. 8.)

Fig. 1 is approximately the true size of the instrument, all other views being approximately double the true size.

The same numbers refer to the same or similar parts throughout.

The spindle 14 has in its surface a longitudinal groove 14^a, semicircular in form at the bottom, and with sides inclined from a radial line, as shown in Figs. 4, 8, and 9. In other words, the groove 14^a is undercut for a purpose to be hereinafter described. The spindle 14 has also a series of transverse grooves 14^b terminating near its axis. The double pinions 12 and 12^b are placed with their journals 12^a resting within the longitudinal groove 14^a, their disks swinging freely within the transverse grooves 14^b, as shown in Fig. 2. The sides of the longitudinal groove 14^a are inclined in relation to the axis of the spindle 14 from a radial line *c* (see Fig. 9) and in the opposite direction from that in which the double pinions 12 are to revolve, which is indicated by the arrow in Fig. 9, which prevents the journals 12^a from rising off their bearings and insures smooth running of the double pinions 12. The number-wheel 13^a first in order carries with it and firmly attached thereto a driving-wheel 11, encircling one end of the first double pinion 12^b. The number-wheel 13 next in order carries an internal gear 10, encircling and meshing with the opposite end of the first double pinion 12^b, and also carries a driving-wheel 11, encircling one portion of the double pinion 12 next in order. The third number-wheel 13 is a duplicate of the second number-wheel. The fourth number-wheel 13 carries an internal gear 10 only, which encircles one portion of the double pinion 12 last in order. The end support 15 is placed upon the spindle 14 and secured firmly thereto. The cylindrical case or shell 16, slotted as shown in Figs. 1 and 2, is slipped over the assembled parts, including the end support 15, to which it is firmly secured. It will be seen that the number-wheel 13^a first in order is extended outwardly, forming the cylindrical hollow thumb-piece 17, and that a shoulder 20 is formed, against which the case 16 abuts; also, that the thumb-piece portion of number-wheel 13^a has within and secured to it an annulus 18, which forms an opposite end support for the spindle 14. The screw 19 passes through the end of the combined thumb-piece 17 and number-wheel 13^a and enters the end of the central spindle 14, thereby securing the thumb-piece 17 and number-wheel 13^a in position, with its shoulder 20 abutting against the end of the case 16, at the same time allowing said thumb-piece and number-wheel to revolve about the central spindle 14 and the screw 19. The number-wheels 13^a and 13 have upon their peripheries a series of figures from 0 to 9, inclusive. The driving-wheels 11 are each provided with a spur 11^a, (see Fig. 5,) projecting toward the axis of the spindle 14 and moving concentrically about the spindle 14 when the instrument is operated. The double pinions 12 are so arranged that their peripheries intersect the circle traversed by the extreme inner ends of the spurs 11^a within driving-wheels 11 and also the teeth of internal gears 10. The rela-

tive proportions of driving-wheels 11 and double pinions 12 are such that the arc of intersection equals two-sevenths of one revolution of double pinions 12. Consequently at each revolution of the driving-wheel 11, first in order, its spur 11^a, coming in contact with the teeth upon double pinion 12^b first in order turns said double pinion through two-sevenths of one revolution. The relative proportions of the double pinions 12 and internal gears 10 are such that two-sevenths of a revolution of the former propels the latter through one-tenth of one revolution or a portion of its circle equaling the portion occupied by one of the figures upon the periphery of the number-wheels 13^a and 13, to which said internal gears are secured.

To operate the instrument the combined thumb-piece 17 and number-wheel 13^a are made to revolve each one-tenth of a revolution, bringing one of the figures upon number-wheel 13^a into view under the slot 21 in case 16 (see Figs. 1 and 2) in their proper order. In entering upon the last tenth part of its revolution the spur 11^a of driving-wheel 11 first in order intersects the peripheral circle of double pinion 12^b, first in order, and causes said double pinion to revolve through two-sevenths of its circle. This motion is transmitted by the said double pinion 12^b to the internal gear within the number-wheel 13 next in order, causing said number-wheel to revolve through one-tenth of its circle, bringing the figure 1 upon said number-wheel 13 into view under slot 21 and the figure 0 into view upon the number-wheel 13^a first in order, and the instrument then registers ten units. A second revolution of the thumb-piece 17 causes the two number-wheels 13^a and 13 first in order to register twenty units.

From the foregoing it will be seen that the instrument will register any amount, limited only by the number of driving-wheels 11, double pinions 12, internal gears 10, and number-wheels 13 employed. The spindle 14 being large in diameter in relation to the instrument forms a strong supporting member for the other parts, and especially a firm support for the journals of the double pinions 12. The said journals being wholly within the periphery of the spindle 14 admit a reduction in size of the instrument to such a degree as to make it available and useful as a pocket-register, and without such delicacy of parts as to be easily broken or disarranged.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a registering-instrument, a spindle 14, provided with a longitudinal journal-bearing groove 14^a, the bottom of said groove being semicircular in form, while its sides incline from a line radiating from the axis of the spindle 14, a series of transverse grooves 14^b, which divide the groove 14^a into sections, in combination with a series of number-wheels and a suitable train of mechanism for operating said wheels, substantially as described.

2. In a registering-instrument, a series of double pinions 12, consisting of toothed disks secured firmly to the ends of a journal 12^a, in combination with a central spindle 14, having transverse grooves 14^b for receiving said pinions' disks and a longitudinal bearing 14^a within its periphery for the journals 12^a, a series of number-wheels 13, and connecting mechanism between said number-wheels and the double pinion 12, substantially as described.

3. In a registering-instrument, the number-wheel 13^a, provided with shoulder 20 and the extension 17, in combination with the central spindle 14, having an undercut groove 14^a, a series of transverse grooves 14^b, a series of double pinions 12, the number-wheels 13, connected with double pinions 12 by a series of internal gears 10, and driving-wheels 11, substantially as described.

4. In a registering-instrument, the annuli, and in combination with the spindle 14, the case 16, the number-wheels 13 and 13^a, the screw 19, the double pinions 12, the driving-wheels 11, and internal gears 10, substantially as described, and for the purposes set forth.

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Witnesses:
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JEFFERSON BROCKNER.