

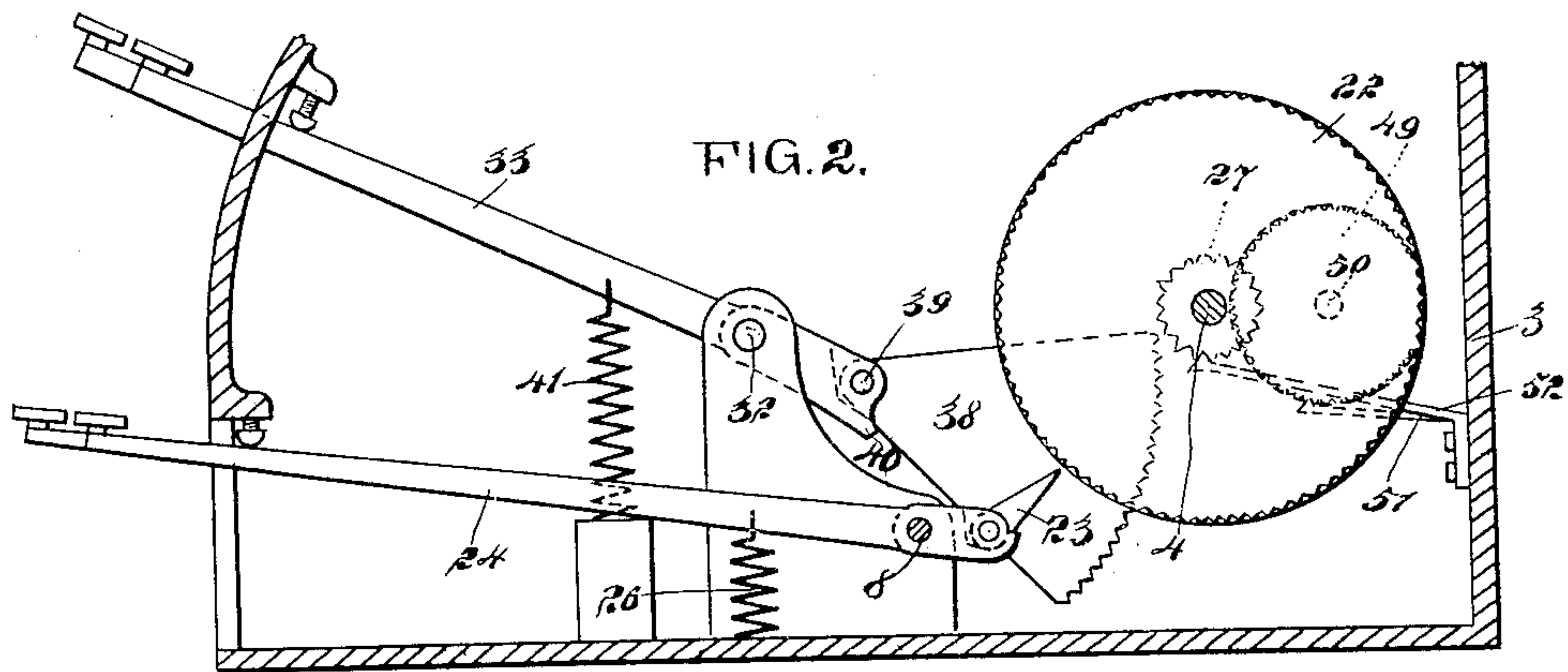
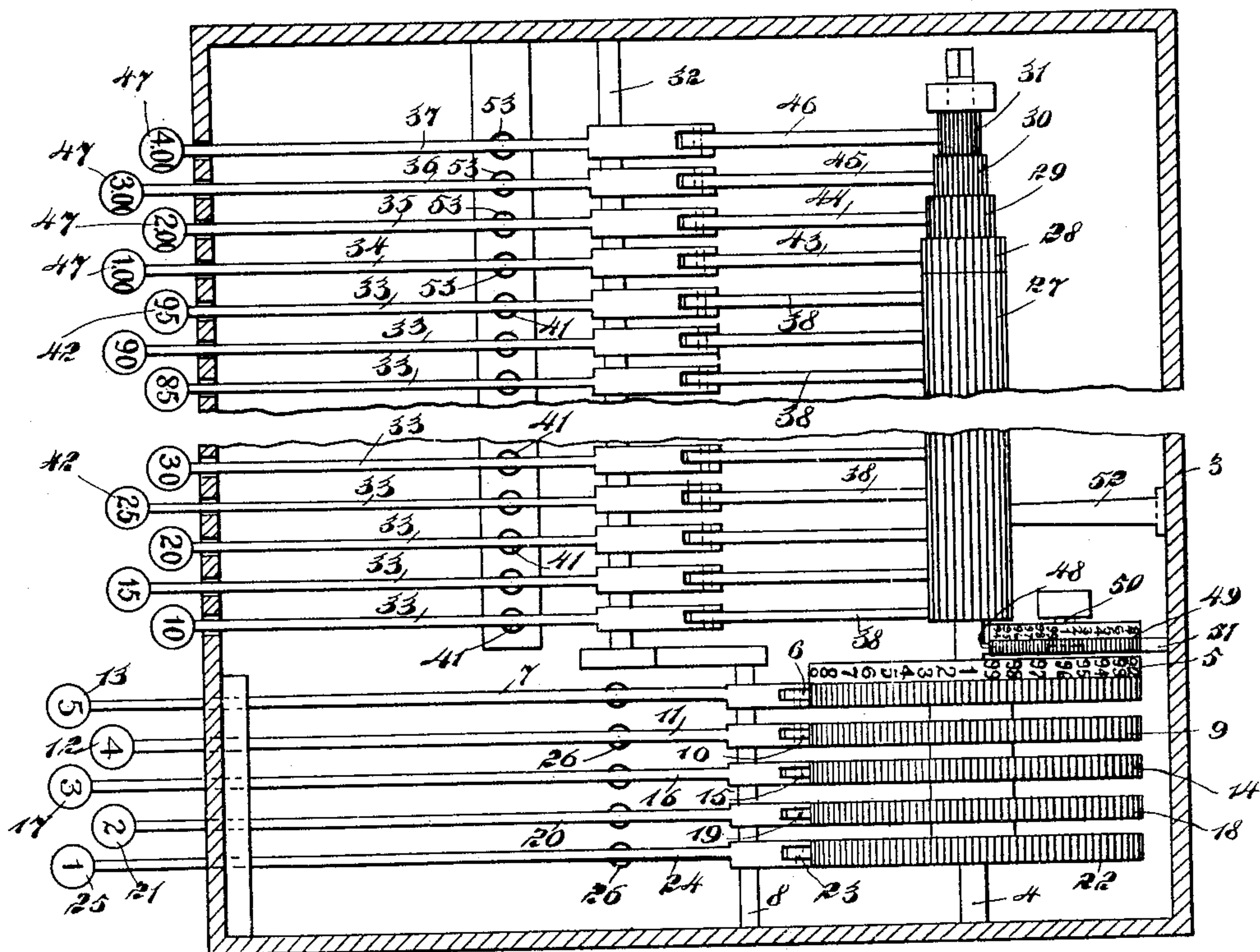
(No Model.)

W. J. ENSWORTH.
ADDING MACHINE.

No. 590,097.

Patented Sept. 14, 1897.

FIG. 1.



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM J. ENSWORTH, OF ERIE, PENNSYLVANIA, ASSIGNOR OF ONE-
FOURTH TO JOHN W. GALBRAITH, OF SAME PLACE.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 590,097, dated September 14, 1897.

Application filed January 23, 1897. Serial No. 620,399. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. ENSWORTH, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and Improved Adding-Machine, of which the following is a full, clear, and exact description.

This invention is a machine by which individual amounts may be successively cast into the register of an aggregate sum. It is useful in connection with cash-registers and other similar machines.

The invention will be fully described hereinafter, and defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both figures.

Figure 1 is a fragmentary horizontal section of the invention, and Fig. 2 is a fragmentary vertical section thereof.

Within the casing 3 is mounted a rotary shaft 4, whereon is fixed a wheel 5, the periphery of which is provided with numbers running consecutively from "1" to "99," and the periphery of which is also provided with ratchet-teeth adapted to be engaged by a pawl 6, pivoted on a lever 7, the fulcrum of which is a shaft 8, carried in the casing. The long arm of the lever 7 projects through the front of the casing 3 and is provided with a key 13, whereon is written the numeral "5." The number of teeth on the face of the wheel 5 and the throw of the lever 7 is of such a regulation that by the operation of the lever 7 the wheel 5 is advanced five of its numbers.

Fixed on the shaft 4 is a wheel 9, the diameter of which is equal to the diameter of the wheel 5. The periphery of the wheel 9 is provided with ratchet-teeth engaged by a pawl 10, carried on a lever 11, fulcrumed on the shaft 8 and having its long arm extended forwardly through the front of the casing 3 and provided with a key 12, whereon is printed the numeral "4." The ratio between the wheel 9 and the throw of the lever 11 is such that the shaft 4 will be turned a degree sufficient to advance the wheel 5 four of its numbers. Fixed on the shaft 4 is a wheel 14, similar to wheel 9. Wheel 14 has a toothed periphery engaged by a pawl 15, carried on a lever 16, similar to the levers 7 and 11, and

having a key 17, whereon is printed the number "3." The operation of the lever 16 advances the wheel three of its numbers. A wheel 18 is also fixed on the shaft 4 and is engaged by a pawl 19, carried on a lever 20, similar to the levers before described, and provided with a key 21, on which is printed the numeral "2." The operation of the lever 20 throws the wheel 5 two of its numbers. A fifth wheel 22 is fixed on the shaft 4 and has a toothed periphery engaged by a pawl 23, carried on a lever 24, similar to the other levers and having a key 25 with the numeral "1" printed thereon. The operation of the lever 24 throws the wheel 5 to one of its numbers. Springs 26 respectively engage the levers 7, 11, 16, 20, and 24 and hold the same in their normal positions.

Fixed on the shaft 4 is a long toothed drum 27. Also fixed on the shaft 4 is a pinion 28, of diameter and number of teeth similar to the diameter and number of teeth of the drum 27. Adjacent to the pinion 28 is a pinion 29, which is fixed on the shaft 4 and has a diameter less than the diameter of the pinion 28 and a number of teeth greater than the number of teeth on the pinion 28. Two additional pinions 30 and 31 are also fixed on the shaft 4 and are graduated downward in size and upward in number of teeth.

Mounted within the casing 3 is a transverse shaft 32. On this shaft 32 are fulcrumed a series of levers 33, 34, 35, 36, and 37. Each lever 33 has a sector 38, pivoted thereon by means of a pin 39 and bearing against a shoulder or knuckle 40 on the lever. The arrangement of these parts is such that the sectors 38 cannot move downward independently of their respective levers 33 any farther than is shown in Fig. 2 of the drawings. The sectors 38 may move upward independently of their respective levers 33. When the levers 33 are pressed downward, the sectors 38 move rigidly with the levers, but when the levers return they may move independently of their respective sectors, so that the distance between the shaft 32 and the periphery of the sectors will be diminished. The sectors 38 engage with the toothed drum 27. As the levers are pressed downward the engagement of the sectors 38 with the drum causes a revo-

lution of the shaft 4. As the actuating-springs 41 of the levers 33 return the levers to their normal positions the sectors 38 move independently on their pivots 39, so that the sectors may return to the position shown in Fig. 2 without reversely operating the shaft 4. Each lever 33 extends through a vertical slot in the front of the casing 3 and carries a key 42. Each key 42 is provided with a number divisible by five and running consecutively from "10" to "95." The proportion between the teeth of the sectors 38 farthest to the right of the casing and the drum 27 is such that the operation of the lever 33, which bears the number "10" will turn the shaft 4 to advance the wheel 5 ten of its numbers. This adjustment runs on in gradual increase with reference to the other levers. The lever 34 is similar in construction to the levers 33 and carries a sector 43 similar to the sectors 38. The sector 43 meshes with the pinion 28, and the arrangement of the teeth is such that upon the movement of the lever 34 the shaft 4 will be turned a complete revolution, which will advance the wheel 5 ninety-nine of its numbers. The lever 35 carries a sector 44, meshing with the pinion 29 and has such an arrangement that the operation of the lever 35 will turn the shaft 4 two revolutions. The lever 36 is also similar to the levers 33 and has a sector 45, similar to the sectors 38 and meshing with the pinion 30 to turn the shaft 4 three revolutions. Finally, the lever 37 is similar to the lever 33 and has a sector 46, similar to the sector 38. The sector 46 meshes with the pinion 31 and serves to turn the shaft 4 four revolutions and advances the wheel 5 a similar number of revolutions. The levers 34, 35, 36, and 37 are provided with keys 47, on which are respectively produced characters representing "\$1," "\$2," "\$3," and "\$4." Springs 53, similar to the springs 41, return the levers 34, 35, 36, and 37 to their normal positions.

The shaft 4 has a projection 48, adapted to engage with the toothed periphery of a wheel 49, mounted on a counter-shaft 50 and having numbers on its periphery running consecutively from "1" to "99." One revolution of the shaft 4 turns the wheel forty-nine and one one-hundredth of a revolution. The wheel 5 represents cents, and the wheel 49 represents dollars. By this adding-machine individual numbers from one cent to four dollars may be cast into the aggregate by the operation of the appropriate lever. Pawls 51 and 52 respectively engage the wheel 49 and the drum 27 to prevent loose revolution thereof.

I have used the term "differential" gear in some of the claims. By this I mean gears of varying sizes with reference to each other.

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

1. The combination of a shaft, a plurality of ratchet-wheels fixed on the shaft, a lever for each ratchet-wheel, a pawl carried by each lever and respectively engaging the ratchet-wheels, the ratchet-wheels having teeth differently proportioned, whereby the shaft will be actuated differently upon the operation of each lever, and a registering device actuated by the shaft, substantially as described.

2. The combination of a shaft, a series of ratchet-disks fixed to the shaft, a lever for each ratchet-disk, a pawl carried by each lever and respectively engaging the ratchet-disks, the ratchet-disks being proportioned to turn the shaft different degrees of revolution, a registering device operated from the shaft, a series of differential gears fixed to the shaft, a lever for each gear, and a sector pivoted to each lever and respectively engaging the gears, substantially as described.

3. The combination of a shaft, a series of ratchet-disks fixed to the shaft, a lever for each ratchet-disk, a pawl pivoted to each lever and respectively engaging the ratchet-disks, the ratchet-disks being proportioned to turn the shaft different degrees of revolution, a registering device actuated by the shaft, a series of differential gears fixed to the shaft, and a sector engaging each gear, substantially as described.

4. The combination of a series of differential gears turning on an axis common to all, a series of sectors respectively meshed with the differential gears and imparting operative movement to the gears whereby to turn the axis of the differential gears various revolutions according to the gear which is operated, and a registering device in connection with said axis and operated therefrom according to the revolution performed by said axis.

5. The combination of a shaft, a series of ratchet-disks fixed on the shaft and having each a number of teeth differing from the numbers of the other disks, levers respectively for the ratchet-disks, a pawl carried by each lever and respectively meshing with the ratchet-disks, a registering-wheel carried on the shaft, and a second registering-wheel mounted independently of the shaft and turned on the same.

6. The combination of a series of differential gears turning on an axis common to all, one of the gears being elongated with the axis, a plurality of sectors meshing with said elongated gear and serving to impart varying degrees of movement thereto, additional sectors respectively meshing with the remaining of the differential gears, and a registering device operated from the differential gears.

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Witnesses:

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