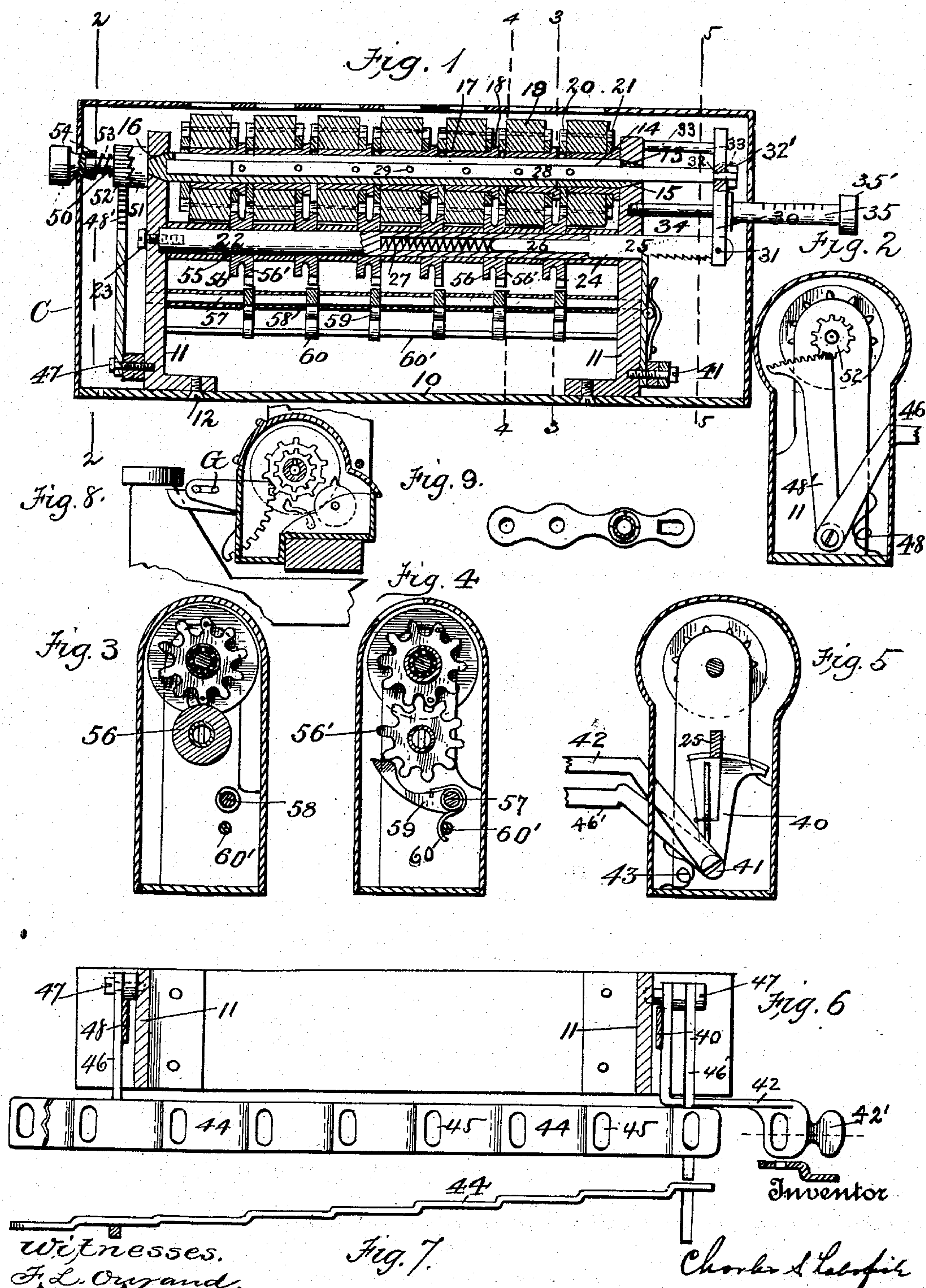


**C. S. LABOFISH.**  
**CALCULATING DEVICE.**

(Application filed Sept. 18, 1900.)

(No Model.)

**2 Sheets—Sheet 1.**



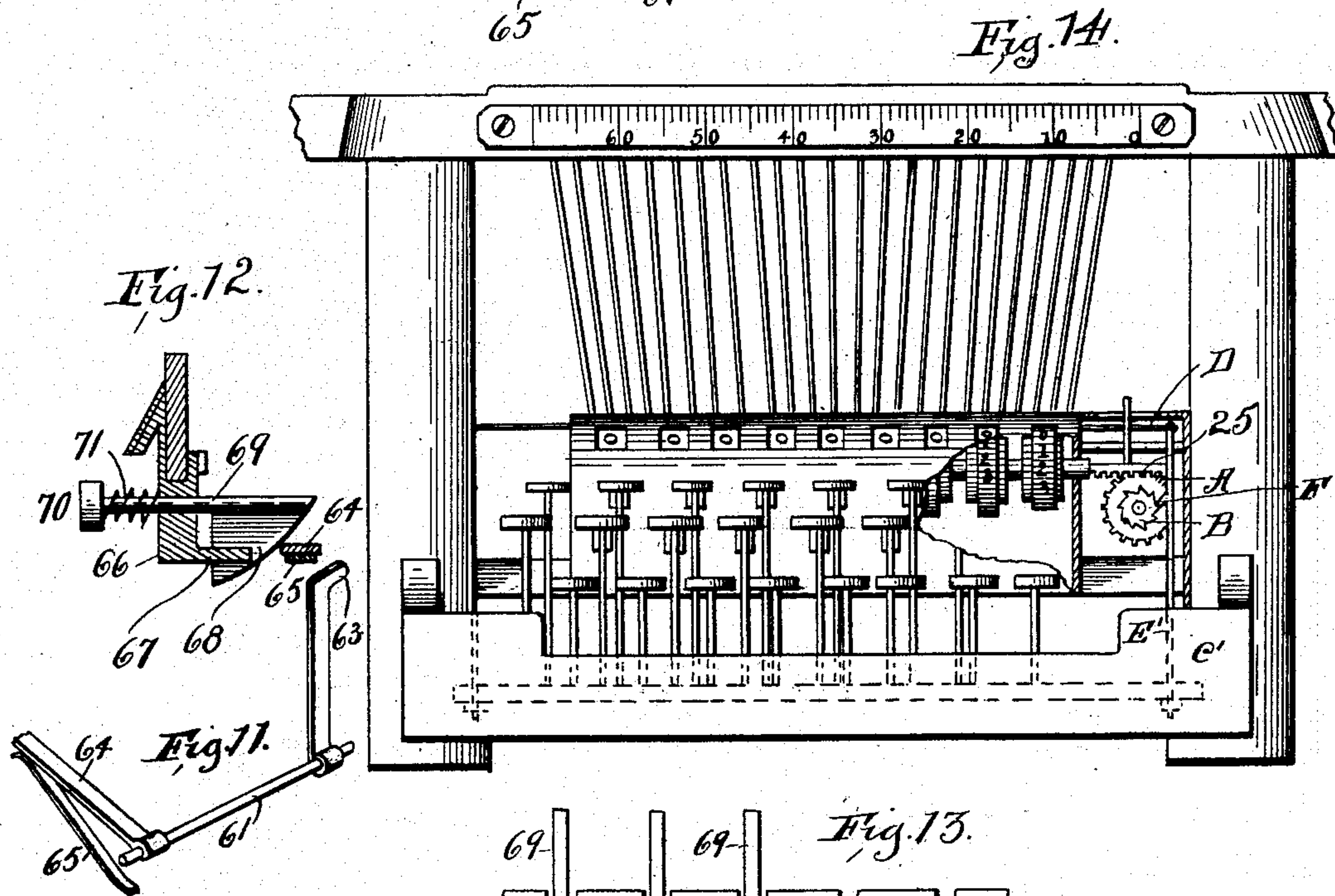
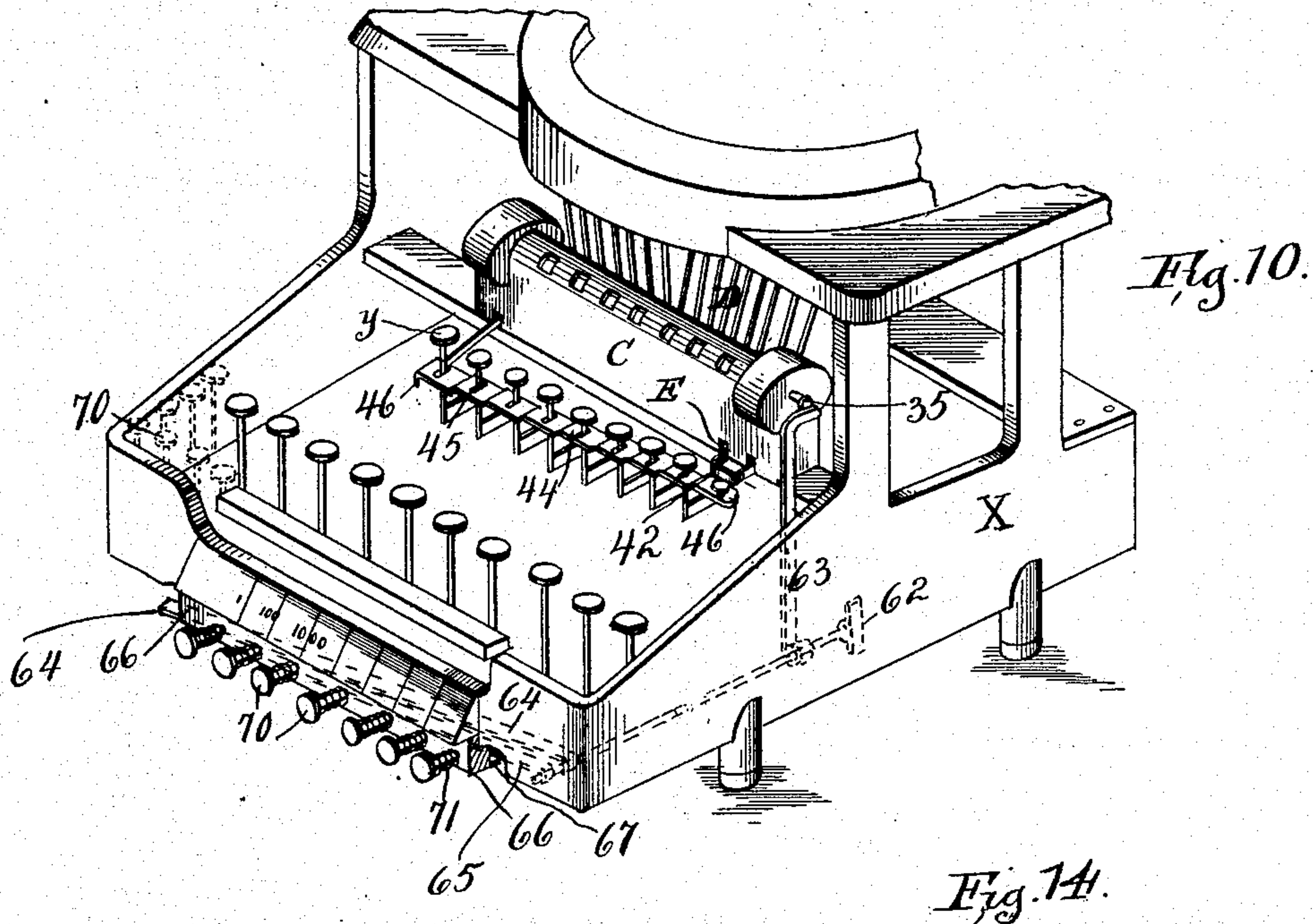


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CALCULATING DEVICE.

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(No Model.)

2 Sheets—Sheet 2.



WITNESSES.  
*John W. Labofish*  
Louis W. Labofish.

INVENTOR.  
*Charles S. Labofish*



# UNITED STATES PATENT OFFICE.

CHARLES S. LABOFISH, OF WASHINGTON, DISTRICT OF COLUMBIA.

## CALCULATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 673,877, dated May 14, 1901.

Application filed September 18, 1900. Serial No. 30,430. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES S. LABOFISH, of the city of Washington, in the District of Columbia, have invented a new and useful Improvement in Calculating Devices for Type-Writers, of which the following is a clear, exact, and full description.

My invention relates to improvements in calculating devices for type-writers; and the object of my invention is to simplify the means used for such purposes and to provide sure means of extending the usefulness of such devices by constructing the same so compact and of such a nature and so entirely automatic as to make its application to a type-writing machine perfectly practical, so that the mere writing of a column of figures on the type-writer will simultaneously register and add the said column of figures within the device automatically without encumbering the type-writer in the least.

The application herewith presented is intended as an improvement on my application, Serial No. 21,793, filed June 27, 1900, reference being had to the accompanying drawings, forming part of my specification, in which—

Figure 1 is a longitudinal sectional view of the calculating device. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 1. Fig. 4 is a cross-section on the line 4 4 of Fig. 1. Fig. 5 is a cross-section on the line 5 5 of Fig. 1. Fig. 6 is a plan view of the base and rocker. Fig. 7 is a side elevation of the rocker. Fig. 8 is a cross-sectional view of a modified construction of my calculating device. Fig. 9 is a detailed view of the coupling seen in Fig. 1. Fig. 10 is a view of the device fitted to the type-writer. Fig. 11 is a detailed view of the means employed to bring any one of the registering-wheels in engagement with the shaft. Fig. 12 is a detailed view of one of the finger-pieces, cam, spring, and guide. Fig. 13 is a detailed view of the detachable plate holding the finger-pieces and cams. Fig. 14 is a front view of the modified construction shown in Fig. 8.

Similar characters of reference refer to similar parts throughout the several views.

In constructing my device a metal base 10

is secured to the type-writer frame X, preferably above the upper bank of keys, intermediate between the movable carriage and the keyboard. Uprights 11 are secured to the said base by means of screws 12. A hollow shaft 13, having a longitudinal slot 14, is formed with conical ends 15 and is journaled in conical bearing-boxes 16, formed in the two uprights, so as to revolve freely with the least amount of friction. Upon the shaft 13 are secured a series of sleeves 17, formed with flanges 18, upon which registering-wheels 19, bearing numerals from "0" to "9" upon their peripheries and having ten-toothed gear-wheels secured on both sides, are journaled. The central opening of the gear-wheel 20 is of such a diameter as to fit the shaft 13 loosely and has ten internal notches cut on its central opening, while the gear-wheel 21 has a central opening corresponding in diameter to that of the registering-wheels. The registering-wheels have thus a perfect bearing on the sleeves and are separated one from another by the flanges 18, leaving the internally-notched gear-wheels free from touching the shaft or catching in the longitudinal slot of the shaft.

At a point below the registering-wheels and parallel therewith is a shaft 22, held securely between the two uprights by the screw 23. This shaft is partially hollow and slotted at 24. In the slotted portion of the shaft is a toothed rack 25, formed with a reduced extension 26, which slides freely in the hollow portion of the shaft. A spring 27 presses the toothed rack normally forward. Within the hollow shaft 13 is fitted to slide freely a rod 28, having a series of pins 29 set therein. These pins correspond in number to the number of registering-wheels in the device and are set at equal distances apart, the distance between each pin 29 and the other being exactly eight-ninths of the distance between each gear-wheel 20 and the other. Only one pin can be in engagement with a registering-wheel at a time, while all others are held out of engagement with any of the registering-wheels.

The slidable rack 25 is coupled with the slidable rod 28 by means of a coupling 30, which has a journal-hole 32, in which the rod



revolves freely, and is pinned to the rack 25 at 31. A nut 32' holds the revoluble rod 28 in its proper position.

Guide-posts 33 and 34 are secured into the right-hand upright, upon which the coupling 30 is sliding freely, so that the slidable rack 25 and rod 28 are guided by posts, preventing binding. A hollow tube 35, having a series of graduation-marks corresponding in number and distance apart to the teeth of the rack 25, is secured to the coupling 30, over the central opening in which the post 33 has its bearing, passing through the aperture made in the casing and having a knob 35' fitted on its outer extremity. When the knob 35' is pushed inward, its graduation-marks indicate the registering-wheel in engagement with the revolving and sliding rod, as is clearly shown in Fig. 1.

A spacing-dog 40, of substantially the same character as is used in type-writers in conjunction with a toothed rack to slide the type-writer carriage step by step forward, which may be of any approved shape or form, is pivoted to the right-hand upright by the screw 41 and has an extending arm 42 projecting from it, reaching the type-writer key bearing the numeral "0," engaging it near its key-top, and an offset 42', whereby it can be depressed without disturbing the type-writer key Y. The dog, with its projecting arm, is held normally upward by the spring 43 and is in constant engagement with the toothed rack 25. The rocking of the projecting arm 42 causes the dog to space the rack forward, it being coupled with the slidable rod 28, having the pins 29 set therein, carries it along, the pins engaging the gear-wheels 20 of the registering-wheels in succession at each depression of the projecting arm 42.

A rocker 44, composed of a strip of sheet metal having nine elongated slots 45, in which the type-writer key-stems have a free movement, is formed like a series of steps, each being one step higher than the other, so that the elongated slot engaging the type-writer key bearing the numeral "9" is close underneath the key-top, while the slot engaging the type-writer key bearing the numeral "1" is eight spaces below the key-top, as is clearly shown in Figs. 6 and 7. From the strip 44 project two arms 46 46'. These arms are pivoted to the two uprights by the screws 42 and 47. The rocker is held normally upward by the spring 48 under the left-hand arm, so that the strip 44, forming a bridge over the two arms, has a vertical movement in front of the calculating-device casing C.

The hollow shaft 13 is provided with a solid extension 50 of a reduced diameter at its left hand and projects through the left-hand upright 11 and through the casing C. Upon the extended end 50 is secured one part of a jaw-clutch 51. The other part of the clutch 52 has ten gear-wheel teeth cut upon its periphery and is journaled loosely upon the extended end 50, being held in mesh with the

fixed portion of the clutch by the spring 53 and thumb-nut 54, which passes through the casing C, for the purpose hereinafter described, as clearly shown in Fig. 1.

A sector 48', having nine gear-wheel teeth in constant mesh with the toothed portion of the jaw-clutch, is secured to the arm 46, so that the rocking of the rocker causes the sector to turn the shaft 13 on its forward movement and to release it on its return, leaving the shaft with its registering-wheels at rest. (See Figs. 1 and 2.)

In order to provide for carrying one in working this device, it is necessary to have means for turning one wheel a distance of one number at each rotation of the next adjacent registering-wheel representing a lower denomination, and to this end upon the shaft 22 are fitted a series of sleeves 55 and twin gear-wheels 56 56' alternately, so that each twin gear-wheel is held directly opposite the gear-wheels 20 and 21 of two adjoining registering-wheels by the separating-sleeves 55. The gear-wheel 56 has but one tooth and is meshing with the gear-wheel 21 at each complete revolution of the adjacent registering-wheel representing a lower denomination, while the gear-wheel 56' has ten teeth and is in constant mesh with the gear-wheel 20 of the registering-wheels. (See Figs. 1, 3, and 4.)

In order to hold the registering-wheels in proper position after they have been turned the desired distance, a shaft 57 is held between the two uprights and a series of sleeves 58 and detents 59 are fitted alternately upon the said shaft, so that the sleeves will hold the detents directly opposite the gear-wheels 56', which are in engagement with those of the registering-wheels. Springs 60 are secured to the detents, their outer ends impinging against a rod 60', also held between the two uprights, as clearly shown in Figs. 1 and 4. This constitutes the tens-carrying mechanism of this calculating device.

The device is operated by the depression of the type-writer keys bearing the numerals it is desired to add. Previous to the depression of the keys the hollow tube 35 is pushed inwardly until one of the pins 29 engages the registering-wheel representing the highest denomination of the number desired to add. This operation is rendered automatic in this device.

A rock-shaft 61 is journaled in bearings 62, preferably arranged on the right-hand inner wall of the type-writer frame along its keyboard. (See Fig. 10.) To this rock-shaft is secured a vertical arm 63 and a horizontal arm 64. The extreme upper end of the vertical arm faces the knob 35' of the tube 35. The horizontal arm is held upward by a spring 65, its normal position being to hold the vertical arm 63 at such a distance from the casing C as to allow the tube 35 to come out of the casing its entire length—that is, until the pin 29 has passed the internal notches of the first registering-wheel, representing units.



A plate 66 is cast with guide-slots 67, in which a number of cams 68, corresponding to the number of registering-wheels in the device and being of different pitch, are held to slide. Finger-pieces 70, provided with stems 69, passing through the plate 66, are secured to the cams, so as to form a unitary structure. Springs 71 are interposed between the finger-pieces and the plate to hold the cams close to the inner side of the plate, as clearly shown in Fig. 12. When a finger-piece is pushed, the cam rides over the horizontal arm and depresses it a distance corresponding to the pitch of the cam, thereby causing the vertical arm to push the tube 35 inward the number of graduations according to the pitch of the cam. The finger-pieces are marked "1," "10," "100," "1000," &c. The cams secured to the finger-pieces are of such pitches or depths as when the finger-piece marked "1" is pushed in its cam will depress the horizontal arm only sufficient to cause the vertical arm to push the tube 35 in a distance of one graduation, bringing the first registering-wheel, representing units, in engagement with the shaft, while when the finger-piece marked "1000" is pushed in the vertical arm will push the tube 35 a distance of four graduations, bringing the registering-wheel representing thousands in engagement with the shaft, and so on.

When there is sufficient room in the keyboard to introduce the required number of finger-pieces close to the front of the type-writer or when the device is mounted on a pedestal, the cams may be entirely dispensed with and the finger-pieces mounted on a plate directly over the horizontal arm, as is shown in the left-hand side of the keyboard in Fig. 10.

Now we will suppose, for instance, that the number six hundred and five is to be added to a number already indicated in the device. The finger-key marked "100" is pushed. This causes the vertical arm to push the tube 35 in a distance of three marks, indicating that pin 29 is in engagement with the third registering-wheel to the left, representing hundreds. The type-writer key marked "6" is struck to print. The rocker-slot engaging the key bearing the numeral "6" is at such a distance from the key as to move the sector which is secured thereto a distance of six teeth, thereby turning the shaft 13 a distance of six-tenths of a revolution, adding six to the number already indicated in the device. When the key is released and the rocker, with its sector, and the split dog, with its projecting arm, return to their normal position, the rack 25 jumps one tooth forward, bringing the pin 29 in engagement with the second registering-wheel, representing tens. The key bearing the "0" is struck to print. The projecting arm engaging the key marked "0" being underneath the rocker (see Fig. 6) in its descension leaves the rocker at rest, and therefore the sector does not turn the registering-wheel in engagement, but on its return

causes the rack to jump one tooth forward, engaging the registering-wheel representing units. The key bearing the numeral "5" is then struck to print. This causes the sector to turn the shaft 13 five-tenths of a revolution, and the numerals "605" will be added to those already indicated in the device. When the key bearing the numeral "5" is released and the dog returns to its normal position, the rack 25 jumps one tooth forward, causing the tooth 29 to pass the last notched gear-wheel, leaving all registering-wheels out of engagement with the shaft 13, and all the numbered type-writer keys may be used without affecting the registry of the device in the least.

The device is provided with a suitable casing C, in which a series of sight-slots D are made on its top, through which the registry of the device can be seen, and vertical slots E in the front, in which the projecting arms of the rocker and dog have a free vertical movement, as shown in Fig. 10.

After a column of figures has been added it is necessary to return the registering-wheels to zero. To this end a thumb-piece 54, referred to heretofore, is secured upon the extreme left end of the shaft 13, which passes through the casing C. When the pin 29 is past the first gear-wheel 20 and all the registering-wheels are out of engagement, the registering-wheels are thrown into engagement individually, beginning from the right, and turned by the thumb-piece 50 until returned to "0."

Figs. 8 and 14 illustrate a modified construction of my calculating device. In this construction the rocker 44 and the dog 40 are entirely dispensed with. The slidable rod 28 terminates into a toothed rack 25' and is in engagement with a gear-wheel A, to which is secured a ratchet B. A universal bar C' is suspended from a rock-shaft D' by the two rods E E'. To the rod E' is secured a tooth F, which when the type-writer numbered keys are depressed moves the ratchet one tooth, causing the slidable rod to bring the registering-wheels in engagement successively. Sectors G are in engagement with each type-writer key and the revoluble shaft, each sector having a number of teeth indicated by the key with which it is in engagement. The depression of the type-writer keys brings the sectors G in engagement with the shaft and turns same a distance corresponding to the number of teeth on the sectors. When the pressure upon the keys is released, the sectors having oblong slots at their fulcrumed points disengage from the shaft by sliding backward and return to their normal position by their own gravity, as shown in Figs. 1 and 14.

It will be seen that this device is extremely simple, neat, and compact in its construction and very efficient in its operation. The mere writing of the figures in addition to one touch of a finger-piece is sufficient to add a row of



figures. No further attention is required, and it does not encumber the type-writer in the least, and while it is specially designed for use in conjunction with a type-writer the device may be mounted on a pedestal and used as an adding or calculating device or counter.

It is evident that numerous slight changes might be made in the general arrangement and formation of parts herein shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not limit myself to the precise details shown, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. A calculating device comprising a base, uprights, a revoluble hollow shaft supported by the uprights, a series of registering-wheels mounted thereon, of a rod provided with a series of projecting studs, adapted to engage the registering-wheels successively, held slidable within the said hollow shaft, substantially as described.

2. A calculating device comprising a base, uprights, a hollow shaft between the said uprights, a series of registering-wheels mounted on said shaft, of a slidable rod having a series of studs, a rack coupled thereto, a dog for operating said rack to slide said rod forward to engage the registering-wheels successively, substantially as described.

3. A calculating device comprising a base, uprights, a revoluble hollow shaft, a series of registering-wheels mounted thereon, a rod provided with suitable means for engaging the registering-wheels successively held slidable therein, of a fixed hollow shaft and a rack coupled with the said slidable rod held slidable therein, as set forth.

4. A calculating device comprising a base, uprights, a revoluble hollow shaft held between said uprights, a series of registering-wheels mounted thereon, of sleeves interposed between the said shaft and the central openings of the registering-wheels, as and for the purpose specified.

5. A calculating device comprising a base, uprights, a revoluble and a fixed hollow shaft held between the said uprights, a series of registering-wheels upon the revoluble shaft, and a rod provided with suitable means for engaging the registering-wheels successively, within the said revoluble shaft, a rack within the said fixed hollow shaft, a dog holding said shaft against the tension of a spring to limit the movement of the said rack, said rack being coupled to the said slidable rod, as set forth.

6. A calculating device comprising a base, uprights, a series of registering-wheels supported thereby, a rod provided with suitable means for engaging the registering-wheels

successively held slidable through the central openings of the said registering-wheels, a slidable rack coupled to the said rod, of a pivoted split dog operating said rack having a projecting arm whereby the said dog is rocked to space the rack outward, substantially as described.

7. In a calculating device for a type-writer the combination of a base, uprights, a series of registering-wheels supported thereby, a rod provided with suitable means for engaging the registering-wheels successively held slidable through the central openings of the said registering-wheels, of a pivoted split dog adapted to operate a rack to control the engagement of the registering-wheels successively, having an extending arm engaging the type-writer key bearing the "0" mark upon its key-top, substantially as described.

8. A calculating device comprising a base, uprights, a revoluble hollow shaft supported thereby, a series of registering-wheels mounted thereon, a rod provided with suitable means for engaging the registering-wheels successively, held slidable within the said hollow shaft, of a jaw-clutch one part of which is secured to the said revoluble shaft, and the other being loosely mounted thereon and having gear-teeth cut upon its periphery, a pivoted rocker adapted to engage the clutch and having an extending arm whereby it is actuated to turn the shaft in one direction and release it upon its return, substantially as described.

9. A calculating device comprising a base, uprights, a hollow shaft supported thereby, a series of registering-wheels mounted on said shaft, a rod provided with suitable means for engaging the registering-wheels successively held slidable within the said hollow shaft, a rack coupled with the said rod and adapted to slide said rod forward, of a tube or rod bearing graduation-marks upon its periphery secured to the said coupling, as and for the purpose specified.

10. A calculating device comprising a base and a series of registering-wheels mounted thereon, a rod provided with suitable means for engaging the registering-wheels successively held slidable through the central openings of the said registering-wheels, a rocker provided with suitable means for turning and sliding the said rod, held pivotally upon the base, of a rock-shaft having a vertical arm adapted to push the said slidable rod inwardly to reengage any one of the said series of registering-wheels, facing the said centrally slidable rod, substantially as described.

11. A calculating device for a type-writer comprising a base, a series of registering-wheels mounted thereon, a rod provided with suitable means for engaging the registering-wheels successively held slidable through the central openings of the said registering-wheels, a rocker carrying suitable means for turning and sliding the said rod held pivotally upon the base, in engagement with the



type-writer keys, a rock-shaft having a vertical arm facing the said slidable rod, and a horizontal arm upon which a series of auxiliary finger-keys are bearing, said finger-keys being adapted to impart variable motion to the vertical arm, substantially as described.

12. A calculating device comprising a base, a series of registering-wheels mounted thereon, a rod provided with suitable means for engaging the registering-wheels successively held slidable through the central openings of

the said registering-wheels, in combination with a series of auxiliary finger-keys adapted to actuate a rock-shaft to return the said slidable rod to reengage the said registering-wheels, or any one of the series, as set forth.

In testimony whereof I have signed my name in the presence of two witnesses.

CHARLES S. LABOFISH.

Witnesses:

B. LEWIS BLACKFORD,  
HELEN L. ABNER.