

No. 714,151.

Patented Nov. 25, 1902.

F. E. COFFEEN.

ADDING MACHINE.

(Application filed Dec. 21, 1901.)

(No Model.)

FIG. 1.

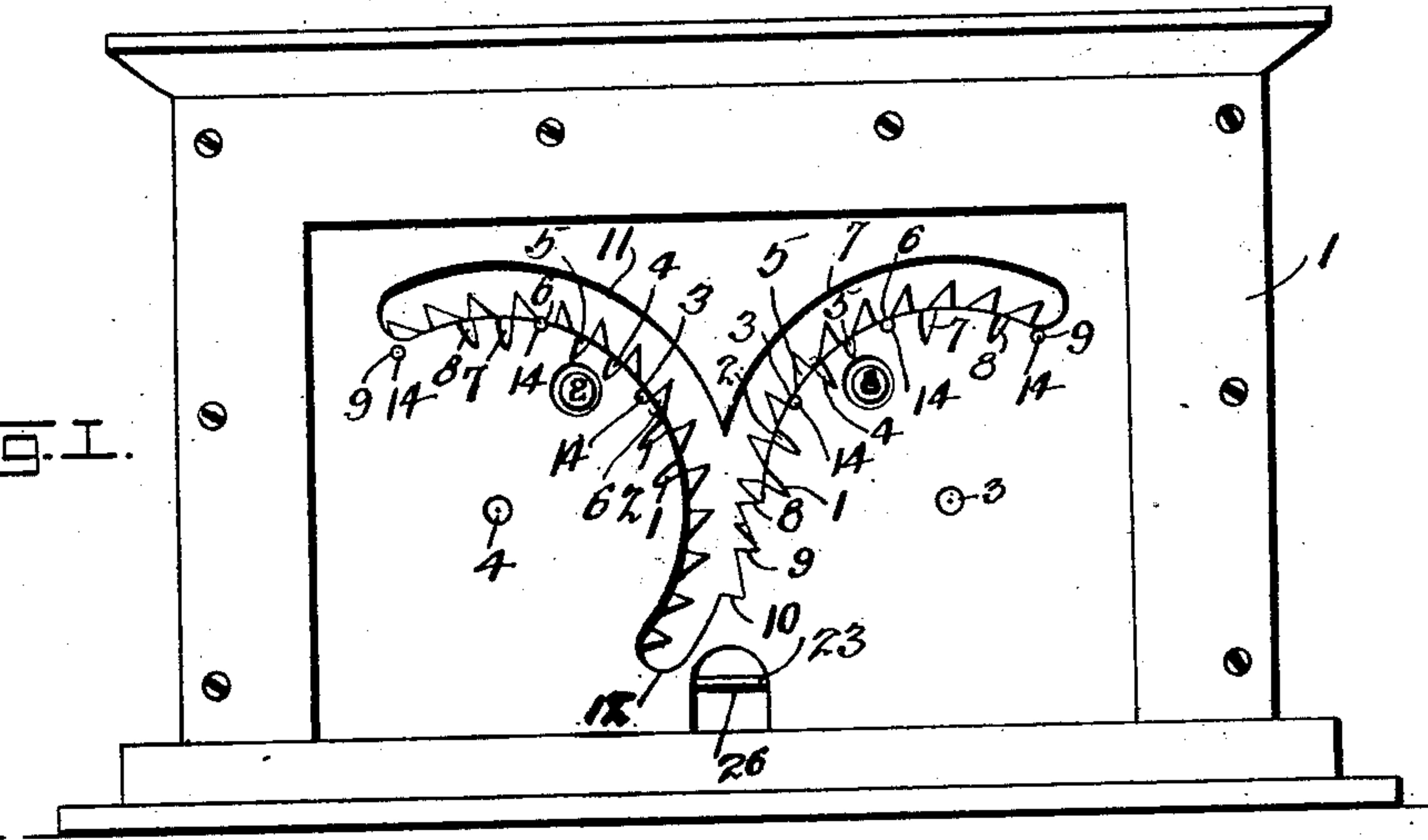


FIG. 2.

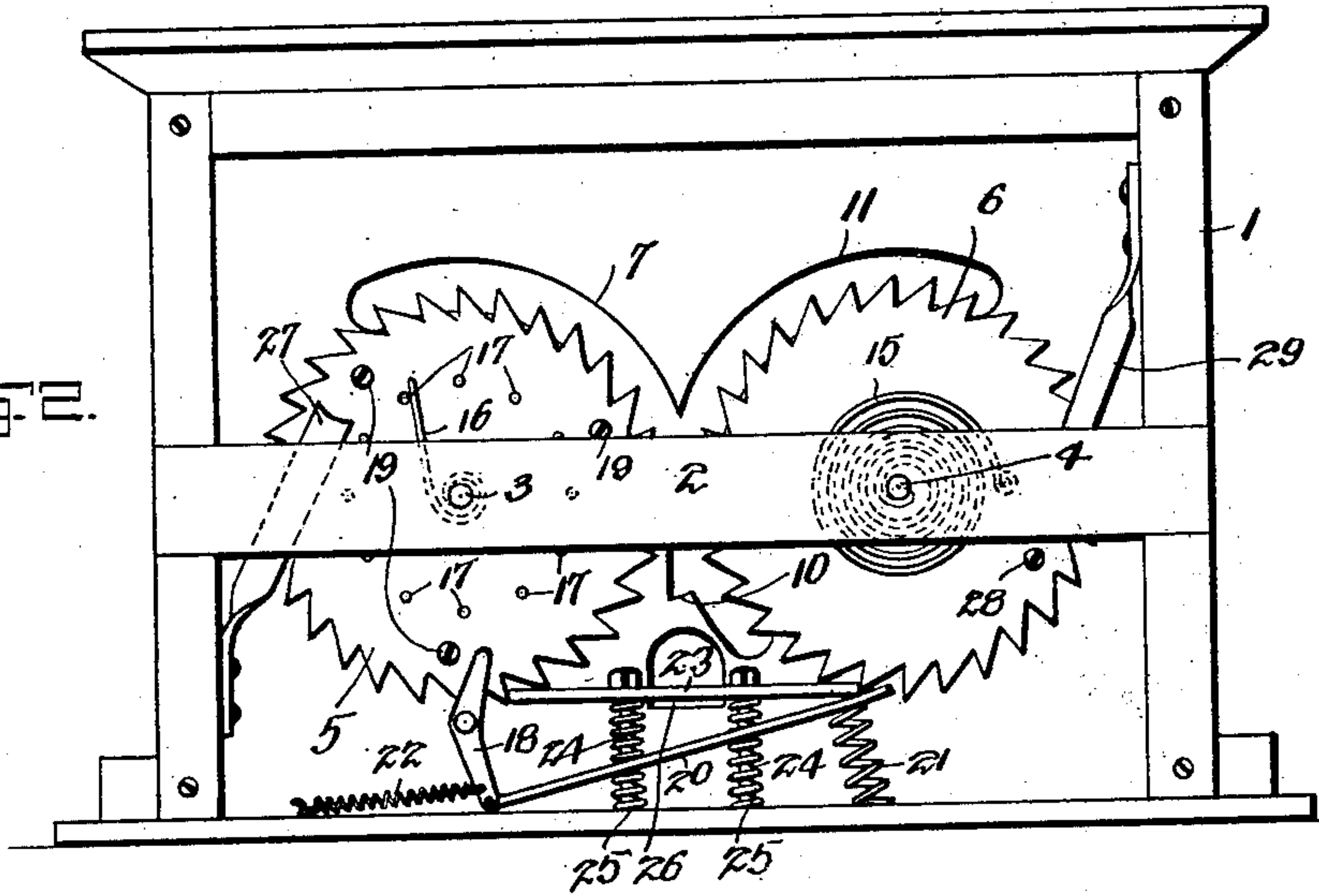
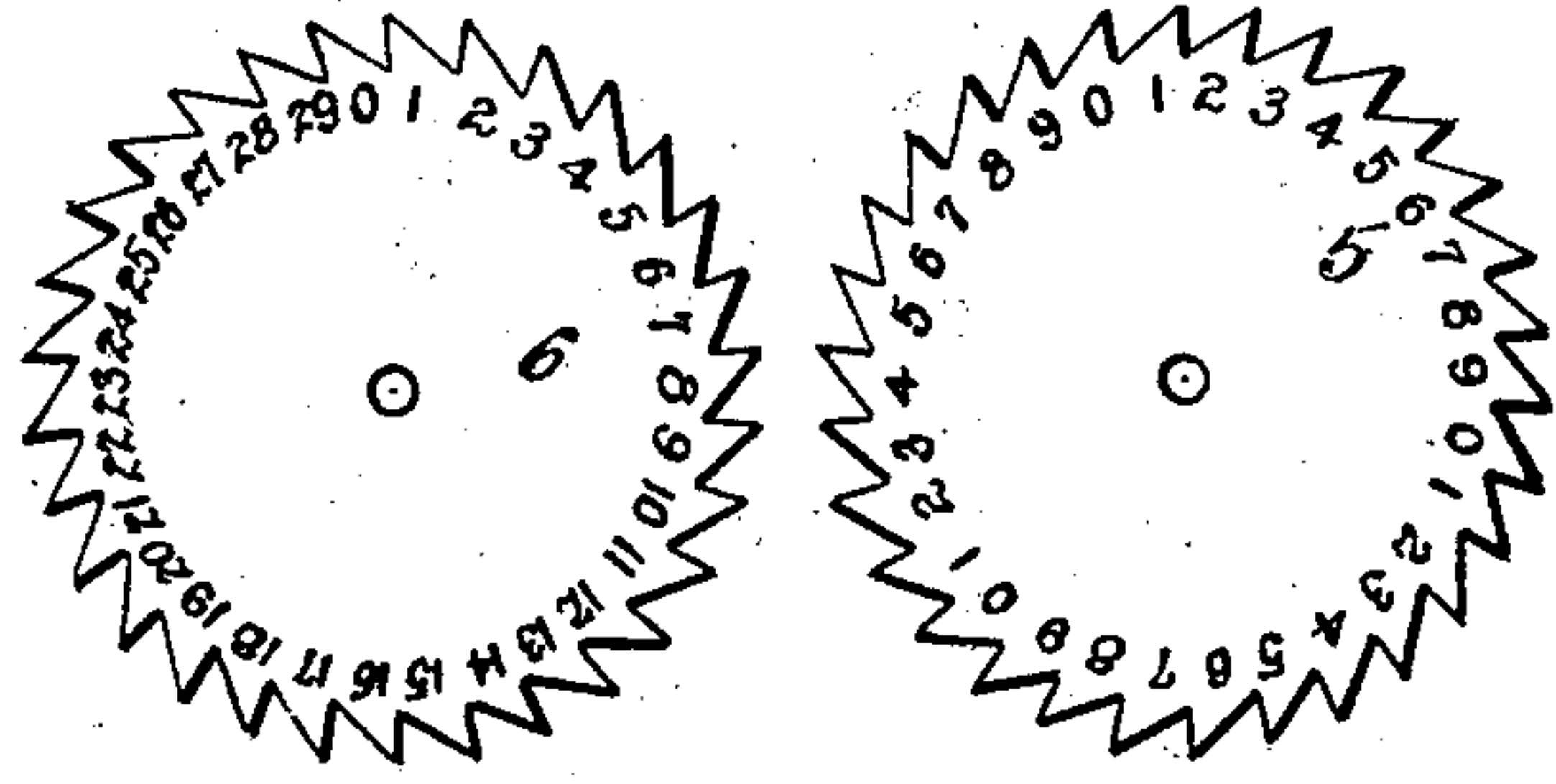


FIG. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS EDWIN COFFEEN, OF WAKARUSA, INDIANA.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 714,151, dated November 25, 1902.

Application filed December 21, 1901. Serial No. 86,799. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS EDWIN COFFEEN, a citizen of the United States, residing at Wakarusa, in the county of Elkhart and State of Indiana, have invented a new and useful Adding-Machine, of which the following is a specification.

This invention relates to adding-machines.

The object of the invention is to provide a simply-constructed, highly-efficient, and durable form of adding-machine, in the operation of which the sense of touch may be relied upon for computing the value of amounts; the machine to be constructed of but few number of parts, and these to be assembled in such manner as danger of derangement or breakage in use will be reduced to a minimum.

With these and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of an adding-machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, there is illustrated a form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit of the invention.

In the drawings, Figure 1 is a view in front elevation. Fig. 2 is a view in rear elevation with the back of the casing housing the operative mechanism removed. Fig. 3 is a detached detail view showing the manner in which the units and tens wheels are laid off with figures.

Referring to the drawings, 1 designates the casing, which may be of any preferred shape, the top, bottom, sides, and ends of which are suitably assembled in any preferred manner to present a rigid structure, all of these parts, with the exception of the front, being preferably imperforate, whereby at once to prevent tampering with the inclosed mechanism and to preclude so far as possible the entrance of dust to the machine.

Arranged longitudinally of the back of the casing and on the interior thereof is a support 2, in which are journaled the rear ends of the

shafts 3 and 4 of the units and tens wheels 5 and 6, respectively, the front ends of these shafts being journaled in bearings formed in front of the casing, as clearly shown in Fig. 1.

The front of the casing is provided with two curved slots concentric with the axis of rotation of the said wheels, the slot 7 opposite the units-wheel being provided near its lower terminal, which is disposed at the center of the casing, with three ledges or projections 8, 9, and 10, and the slot 11 opposite the tens-wheel being projected some distance below the ledge 10, as clearly shown in Fig. 1. The lower edge of each of these slots is divided into nine divisions, those in the slot of the units-disk designating units from "1" to "9," the ledge 8 representing zero, and those in the slot of the tens-disk representing tens from "1" to "9," the ledge 8 of the units-slot also representing zero for the tens-wheel, the remaining ledges 9 and 10 and the bottom or terminal 12 of the slot 11 constituting three units or three tens, the function of which will appear later on. The divisions in the slots to which reference has been made consist of notches 13 at the divisions 1, 2, 4, 5, 7, and 8 and knobs or projections 14 at the divisions 3, 6, and 9, the provision of these notches and knobs or projections rendering it possible for the operator by exercising the sense of touch to determine which of the divisions is to be employed in adding. Thus, for example, should it be desired to add three to a number, the operator would pass his fingers along the edge of the slot either 7 or 11, as the case might be, until the first knob is engaged, when he will know that his hand is opposite the division 3, or by further moving his hand along until it contacts with the second knob opposite the division 6 or still further into contact with the third knob opposite the division 9. Should it be desired to add one to a number, the operator would pass his finger from the first ledge 8 upward to the first notch, this being "1," or if seven is to be added to a number he will move his fingers into engagement with the first notch opposite the second knob. When the manner of arrangement of the knobs and notches has once been mastered, the division required can be determined almost instantaneously and with absolute certainty.

Each of the wheels 5 and 6 is provided in this instance with thirty teeth in the shape

of ratchet-teeth, and the teeth of the units-wheel are divided into groups of ten, while the teeth of the tens-wheel are arranged in numerical order from "1" to "29." The shaft of the tens-wheel has associated with it a coiled spring 15, which may be an ordinary clock-spring, which is placed under tension as the said wheel is rotated and operates automatically to return it to zero when released by mechanism presently to be described. The units-wheel is also associated with a spring 16, one end of which is suitably secured to the support 2 and the other end to the wheel by one of a plurality of pins 17, these pins being provided to keep the spring under the requisite tension or to change the same, when desired.

The mechanism for imparting motion of the tens-wheel from the units-wheel as ten is added comprises a rock-lever 18, preferably in the form of a bell-crank lever, and pivoted at its bend to the casing, one end of the lever being arranged in the path of travel of three pins 19, one of each of which is opposite the zero on the units-wheel, the other end of the lever having connected with it a push-bar 20, disposed to engage the teeth of the tens-wheel and held in operative relation thereto by a spring 21, the bar being normally held out of engagement with the teeth or in retracted position by a spring 22, one end of which is secured to the bottom of the casing and the other end to the lower arm of the lever 18. It will readily be seen that as the units-wheel is rotated on its shaft, that when one of the pins 19 engages the upper arm of the lever 18 its lower arm will be projected thereby throwing the push-bar 20 forward and moving the tens-wheel one tooth.

To hold the units and tens wheels against retrograde movement, due to the tension of the springs 15 and 16, a locking-bar 23 is employed which is of a length to engage a tooth of each of the wheels and is held in operative position by two vertical guides 24, upon which the bar is adapted to slide, springs 25, mounted on the guides and exerting upward pressure against the bar 23, serving to hold it in the position shown in Fig. 2. In order to release the bar 23 from engagement with the units and tens wheels when it is desired to have them returned to zero, an opening 26 is provided in the front of the casing through which the finger of the operator may be inserted to depress the bar, as will be clearly understood by reference to Fig. 2.

In addition to serving as a means for tripping the lever 18 the pins 19 also operate as stops for checking the rotation of the units-wheel at one or the other of the zero-points thereon, a spring 27, secured to one end of the casing, being provided to interlock with the pins for this purpose. The spring is flexed inward to lie in the path of the pins, but will readily yield as the wheel is being turned in the operation of the machine. The tens-wheel is provided with a single pin 28, which coacts

with a spring-stop 29 for the purpose just described, so that upon depression of the locking-bar 23 both of the said wheels will return to the zero-point.

In operating the units-wheel in adding from one to nine the tooth of the wheel opposite the number to be added and, as indicated, either by a knob or a notch in the slot 7 is stopped at the first ledge, which, as before stated, designates zero. If over ten the tooth will be stopped at the second ledge 9; if over twenty, at the third ledge 10, and if over thirty at the stop 12, formed by the bottom of the slot 11, this same rule applying in operating the tens-disk.

The figures on the units and tens wheels show through openings 30 and 31, respectively, in the front of the casing, as clearly shown in Fig. 1.

It is to be understood that other wheels may be combined with the machine to add higher numbers. A third wheel for recording hundreds could be operated from the tens-wheel in the same manner as the tens-wheel is operated from the units-wheel, and another wheel for recording thousands could be operated from the hundreds-wheel, and as the principle governing the operation of the additional wheels will be the same as that already described detailed illustration is deemed unnecessary.

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

1. An adding-machine comprising a casing provided in its front with two curved slots, the lower edges of which are provided with scales the values of the divisions of which are determined by the sense of touch, and computing-wheels arranged back of the slots and provided with means by which they may be operated.

2. An adding-machine comprising a casing provided in its front with two converging curved slots, the lower edges of which are provided with scales the values of the divisions of which are determined by the sense of touch, and computing-wheels arranged back of the slots and provided with means by which they may be operated.

3. In an adding-machine, the combination with a casing provided in its front with curved slots bearing scales the values of the divisions of which are determined by the sense of touch, of computing-wheels arranged back of the scales and having operating means projecting opposite the slots, motion-transmitting means in engagement with one of the wheels, and means carried by the other wheel to actuate the motion-transmitting means.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANCIS EDWIN COFFEEN.

Witnesses:

FLOYD H. JOHNSTON,
PETER M. EARTS.