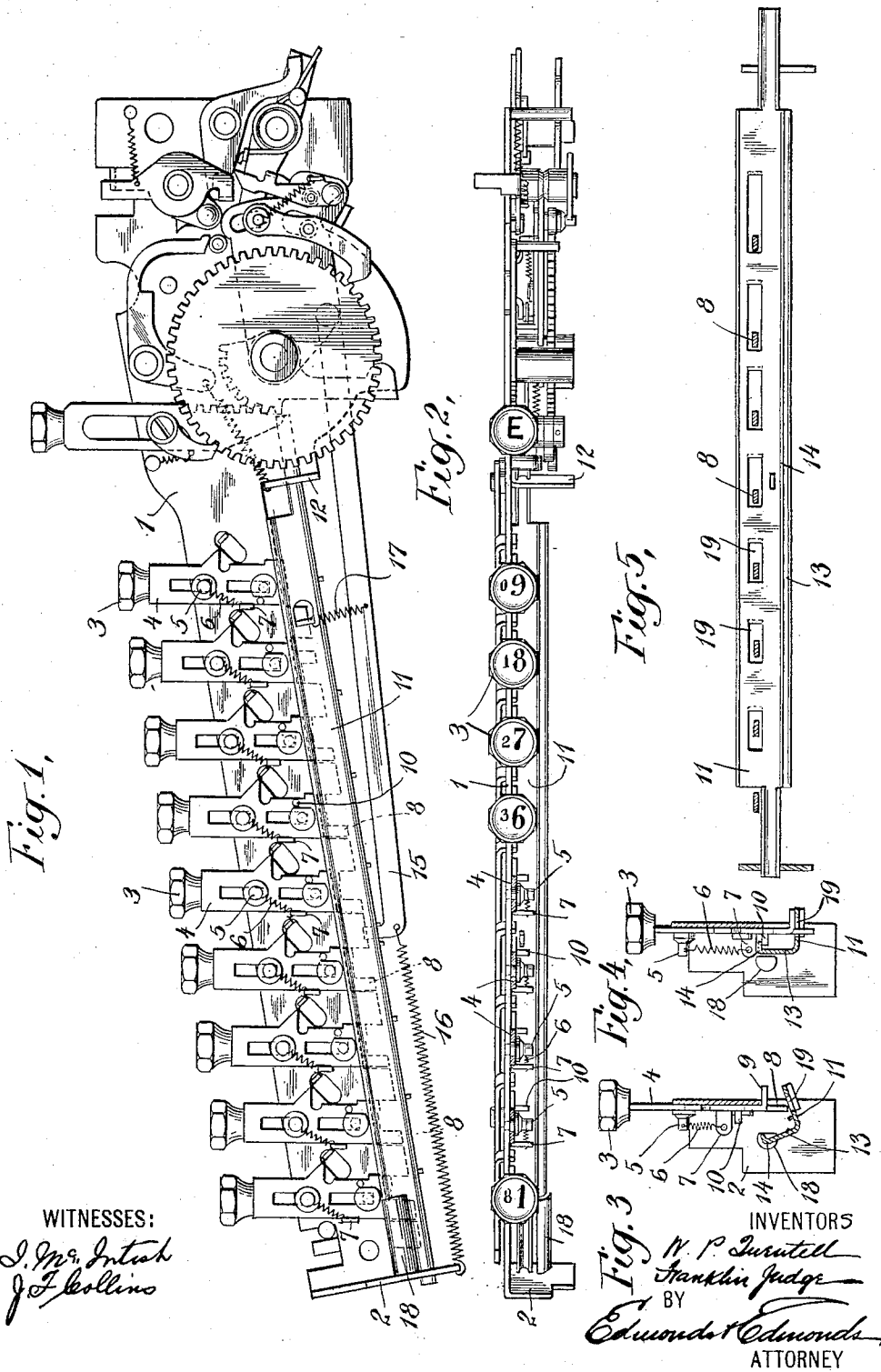


W. P. QUENTELL & F. JUDGE.
 CALCULATING MACHINE.
 APPLICATION FILED JAN. 24, 1912.

1,031,371.

Patented July 2, 1912.



UNITED STATES PATENT OFFICE.

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CALCULATING-MACHINE.

1,031,371.

Specification of Letters Patent.

Patented July 2, 1912.

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To all whom it may concern:

Be it known that we, WILLIAM P. QUENTELL and FRANKLIN JUDGE, both citizens of the United States, the former residing in the city, county, and State of New York, and the latter residing at Greenfield, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification.

This invention relates to calculating-machines of the type known as "key-set" machines, and has reference particularly to calculating-machines of the type shown in United States Patent No. 1,007,488, granted to us October 31st, 1911.

The invention is directed to the provision of an improved form of keyboard mechanism for a key-set calculating-machine of the slide-bar type, so constructed that the slide-bars will move lengthwise when a key is depressed an amount proportionate to the value of the depressed key and the slide-bar will lock all of the keys, the depressed key in the depressed position and the remaining keys in the elevated positions.

The invention involves the provision of a calculating-machine having a plurality of rows of keys and a slide-bar for each row of keys which is both movable lengthwise and pivoted for rocking movement about an axis. The lengthwise movement of the slide-bars is effected when any key is depressed and positions the parts whereby the number-wheels of the machines are advanced the requisite amount. The pivotal movement of the slide-bars effects the releasing of the slide-bar to permit of the lengthwise movement and the locking of the slide-bar against such movement; also it effects the locking of all of the keys in the row corresponding to the slide-bar, the depressed key in its depressed position and the remaining keys in the elevated positions.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of one unit for an adding-machine adapted for calculation in one numerical order; Fig. 2 is a top view of the unit; Figs. 3 and 4 are sectional views of the unit shown in Figs. 1 and 2, the two figures illustrating different positions of the

parts; and Fig. 5 is a top view of the slide-bar.

The calculating-machine shown in the drawings is of the character known as a "key-set" machine, wherein the depression of keys positions certain of the operating parts of the machine in accordance with the values of the keys depressed, and thereafter an operating device is moved manually or in any other suitable manner, to cause the number-wheels of the machine to be actuated an amount depending upon the extent of movement of the parts positioned by the depression of the keys. A plurality of rows of keys are provided, as many rows as the number of numerical orders in which it is desired to operate, each row comprising nine keys numbered from one to nine. One key in each row may be depressed for each operation, and when that key is depressed it is locked in its depressed position and the other keys in the row are locked against depression. When a key in a row is depressed, it permits a slide-bar corresponding to that row to move in the direction of its length a distance corresponding to the value of the key depressed, and as this slide-bar moves thus it positions a differential mechanism, whereby the number-wheels are thereafter actuated the requisite amount when the operating device of the machine is actuated. In the present instance, practically all of the mechanism for calculating in one numerical order is mounted upon a single supporting member, such, for instance, as a sheet-metal plate, so that any desired number of these units may be assembled within a suitable casing to form a machine of the desired capacity.

Referring to the drawings, the supporting member of the unit consists of a piece of sheet-metal 1, having its forward end 2 turned at a right angle to the body portion of the strip to form a spacer. A row of nine keys, 3, is mounted upon the support 1, these keys being numbered from one to nine, beginning at the front of the machine. Each of these keys 3 is mounted upon a stem 4 and is adapted to slide vertically upon the support 1. For this purpose, each key-stem 4 is provided with two slots, through which extend the shanks of studs 5 entering openings in the support 1. Each key is normally held

in the raised position by means of the spring 6, one end of which is secured to an eye 7 formed upon the key-stem 4 and the other end of which is secured to one of the studs 5. At its lower end, each key is provided with a downwardly extending projection 8, and in rear of this a laterally extending projection 9. Also, each key is provided with a laterally extending stud or projection 10. The lower ends of all the keys in the row are adapted to coact with a pivoted sliding-bar 11 of angular cross-section. This bar is pivotally mounted in openings formed one in the laterally extending end 2 of the support 1 and the other in a similar lateral extension 12 integral with support 1. In the body portion of the bar 11, are a plurality of spaced openings or slots of progressively increasing length, as shown in Fig. 5, through which the projections 8 on the key-stems are adapted to project when the keys are depressed.

The bar 11, as above stated, is of angular cross-section, it being bent lengthwise to form a side wall 13 and at the top thereof a flange 14 directed toward the key-stems. In the bottom wall of the bar 11 is an opening and an upwardly turned end of a link 15 enters loosely into this opening. A spring 16 is connected at one end to the link 15 and at the other end to the lateral extension 2 of the support 1, so that this spring tends to draw the link 15 and the slide-bar 11 forwardly. A spring 17 is connected at one end to the link 15 and at the other to an eye formed upon the slide-bar 11, so that this spring tends to turn the slide-bar 11 on its pivots far enough to carry the end of the wall 13 of the slide-bar opposite the end of the stud 18 mounted upon the extension 2 of the support 1. When the bar 11 is in this position, as shown in Fig. 2, it is held against movement actuated by spring 16. When any key 3 is depressed, the extension 8 thereon is projected through its corresponding opening 19 in the slide-bar 11, and thereafter the lateral projection 9 on the key-stem engages the slide-bar 11 and rocks that bar on its pivots against the tension of spring 17 sufficient to carry the end of the side wall 13 free of the stud 18. When this occurs, the spring 16 draws the link 15 and the slide-bar 11 forwardly until further movement of the slide-bar is arrested by the projection 8 on the stem of the depressed key engaging the rear wall of the corresponding slot 19 in bar 11. When the slide-bar 11 is rocked on its pivots thus by the projection 9 on a key-stem, the projection 10 on the other side of the key-stem is carried by the downward movement of the key below the flange 14 on the slide-bar and the pivotal movement of the slide-bar carries the flange 14 over the pin or projection 10 on the key which has been depressed, so that the flange 14 pre-

cludes that key from being returned to its initial position by its spring 6. Also, this movement of the slide-bar carries the flange 14 under the studs or projections 10 on the stems of all of the other keys in the row, so that it precludes depression of any one of the other keys.

The operating device of the machine forms no part of the present invention and therefore need not be described in detail. However, it is adapted to draw all of the slide-bars which have been moved lengthwise back to their initial positions, and in doing so to actuate the number-wheels of the machine. When the slide-bars have been so returned to initial position, they are rocked on their pivots by the springs 17, so that the walls 13 of the slide-bars are carried opposite the ends of the studs 18 and the slide-bars are held in the positions in which they are shown in Figs. 2 and 3. When the slide-bars are so rocked, the flanges 14 thereon are carried away from the key-stems of the rows corresponding thereto so far as to unlock all of the keys.

No opening 19 need be provided in the slide-bar for the stem of the number "1" key. As shown in Fig. 5, the stem of this key is arranged to be depressed opposite the end of the wall of the slide-bar and to coact with that end wall to limit the movement of the slide-bar to that necessary for actuating the number-wheels to the extent of one unit. Also, no opening in the slide-bar need be provided for the number "9" key. This key need be arranged merely to rock the slide-bar on its pivot, so as to release it from the stud 18 and the lengthwise movement of the slide-bar may be limited by the coaction of the end wall of the slide-bar with projection 2.

The mechanism described constitutes in practice a very convenient, inexpensive and reliable slide-bar mechanism, whereby the slide-bars may be given the requisite lengthwise movement and the locking of the keys effected with the depressed keys held in their depressed positions and the other keys prevented from being depressed.

Having now described our invention, what we claim as new therein and desire to secure by Letters Patent is as follows:—

1. In a calculating-machine, the combination of a row of keys, a pivoted sliding-bar adapted to be engaged and rocked by any one of said keys, means for moving the bar lengthwise when so rocked, and means operated by the rocking movement of said bar on its pivots for locking the key depressed in its depressed position and the other keys against depression, substantially as set forth.

2. In a calculating-machine, the combination of a row of keys, a pivoted sliding-bar adapted to be engaged and rocked by

any one of said keys, means for moving the bar lengthwise when so rocked, a projection on each key, and a flange on said bar so arranged that when the bar is rocked by the depression of a key said flange will move over the projection on the key depressed and under the projections on the other keys, substantially as set forth.

3. In a calculating-machine, the combination of a row of keys, a pivoted sliding-bar coacting therewith, a spring for turning said bar on its pivots in one direction, a stop with which the bar coacts when so turned for holding the bar against lengthwise movement, a spring for moving the bar lengthwise when the latter is released from the stop, a part on each key adapted when the key is depressed to rock the bar on its pivots and disengage the bar from said stop to permit the bar to move lengthwise, a

lateral projection on each key, and a flange on said bar so arranged that when the bar is rocked by the depression of a key the flange will move over the projection on the key depressed and under the projections on the other keys, substantially as set forth.

This specification signed by me, WILLIAM P. QUENTELL, and witnessed this 11th day of January, 1912.

WILLIAM P. QUENTELL.

Witnesses:

H. J. EY,

JOHN J. WARD.

This specification signed by me, FRANKLIN JUDGE, and witnessed this 19th day of January, 1912.

FRANKLIN JUDGE.

Witnesses:

CHARLES ALLEN,

PERRY C. STEARNS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."