

No. 615,895.

Patented Dec. 13, 1898.

W. H. PIKE, JR.  
CALCULATING MACHINE.

(Application filed Feb. 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

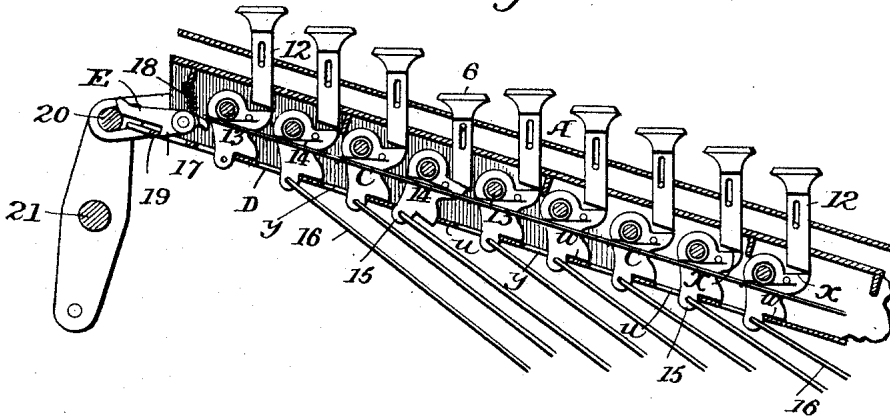


Fig. 2.

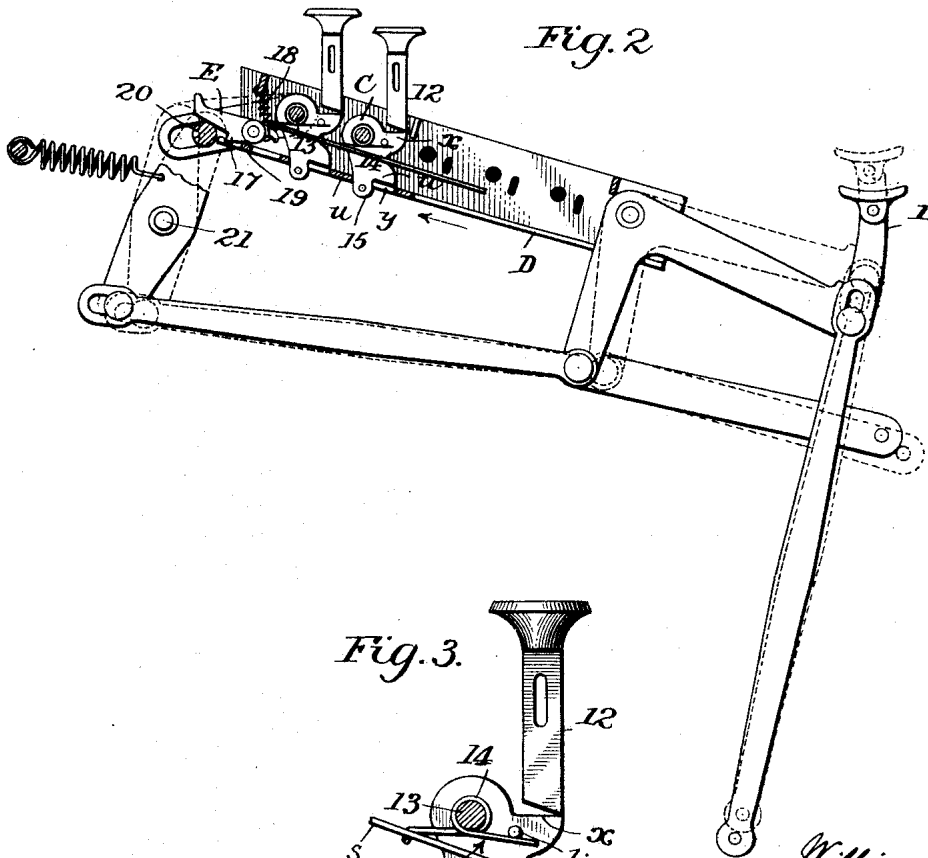
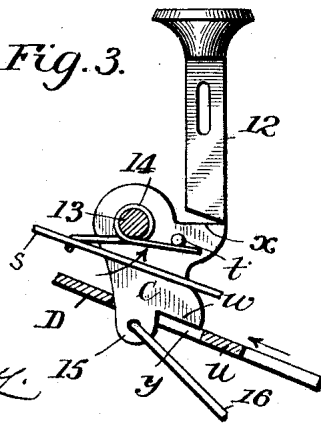


Fig. 3.



Witnesses  
*J. Hinkel*  
*Harry C. Hay*

Inventor  
*William H. Pike Jr.*  
by *John L. Sullivan*  
Attorneys

No. 615,895.

Patented Dec. 13, 1898.

W. H. PIKE, JR.  
CALCULATING MACHINE.

(Application filed Feb. 3, 1898.)

(No Model.)

2 Sheets--Sheet 2.

Fig. 4.

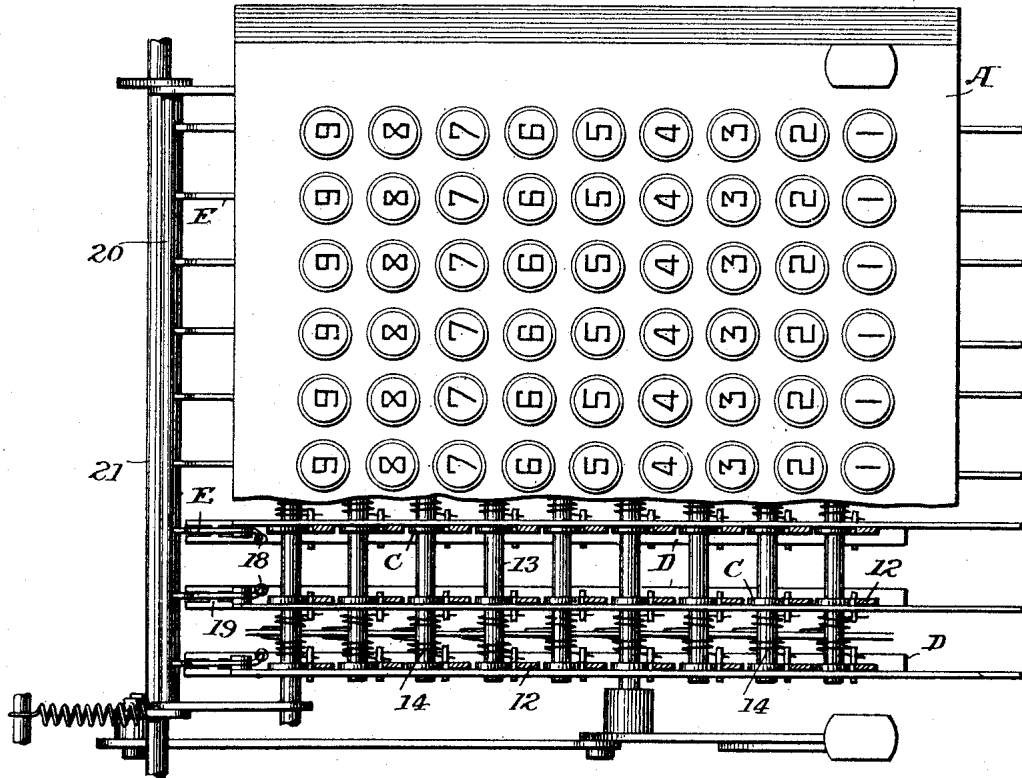


Fig. 5.

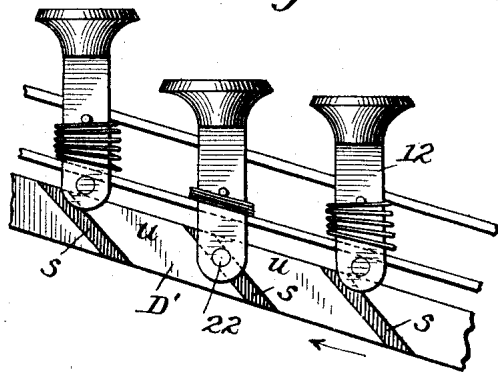
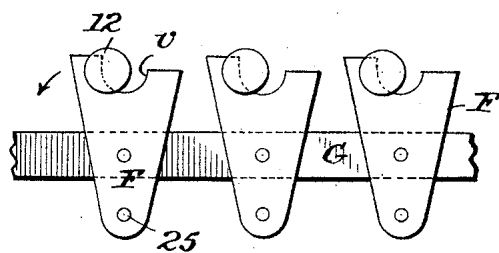


Fig. 6.



Witnesses  
*J. G. Hinkel*  
*Harry E. Hay*

Inventor  
*William H. Pike Jr.*  
 by *Joseph Freeman*  
 Attorneys

# UNITED STATES PATENT OFFICE.

WILLIAM HENRY PIKE, JR., OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE  
AMERICAN ARITHMOMETER COMPANY, OF SAME PLACE.

## CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,895, dated December 13, 1898.

Application filed February 3, 1898. Serial No. 669,000. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY PIKE, Jr., a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification.

My invention relates to that class of calculating or registering machines in which the numbers of the indicating or printing device are brought into position by the action of series of keys which are depressed or operated by the operator; and my invention consists of means for locking all the keys of a series in elevated or non-operating positions after any one of the keys is depressed, thereby preventing the accidental depressing of two or more keys of a series, the said means being fully set forth hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of sufficient of a calculating-machine to illustrate my improvements. Fig. 2 is a sectional view of some of the parts in connection with the devices for restoring the locking parts to position. Fig. 3 is an enlarged view of one of the keys and adjuncts in part section; Fig. 4, a part sectional plan of a keyboard and devices sufficient to illustrate my invention, and Figs. 5 and 6 views illustrating modifications.

I have not considered it necessary to illustrate in the drawings the details of the entire calculating-machine, inasmuch as these may be of various different constructions, my invention being applicable to any class of machines where there are series of keys arranged in rows and serving directly or indirectly, as through rods 16, to operate the indicators or printing-wheels or control the operation of such indicators or wheels; but the general arrangement of parts illustrated corresponds substantially with that of the Burroughs' calculating-machine of Letters Patent No. 504,963.

A is the keyboard of the machine, provided with any desired number of series of nine keys each, and numbered from "1" to "9," as best shown in Fig. 4, and, as shown, each key is upon a vertical stem 12, sliding in the keyboard. The lower end of each stem is beveled and rests upon the shoulder  $w$  of a

pivoted dog or crank-lever C, which is hung to a cross-bar 13, on which is coiled a coiled spring 14, having a loop which passes under a retaining-rod  $s'$  and which extends at each end under a pin  $t$  on the adjacent lever C and tends to throw the lever in the direction of the arrow, Fig. 3, and maintain the key in an elevated position.

Beneath each series of keys extends a locking-strip D, having a series of slots  $y$  beneath each of the crank-levers C for the reception of an ear or projection 15, extending from said crank-lever. Each lever is connected by a rod 16 with a stop 17, the position of which determines the operation of the registering devices in a manner not necessary to be here described, but so that if a lower key—as, for instance, the key 3—was accidentally depressed the position of the stop would prevent the registration of a number indicated by a higher key—as, for instance, the key 6. It would therefore result that if it was desired to register the number "6" and the key 3 was accidentally depressed the number "3" would be registered instead of the number "6." To prevent this result, I so construct and arrange the parts of the machine that after one key has been depressed to set the regulating-stop or otherwise adjust the parts to effect a registration of the number indicated by that key it will be impossible to depress any other key of the same series. Different arrangements of devices may be employed to secure this result, but, as shown, I prefer to make use of the strip D and provide each of the crank-levers C with a bearing or shoulder  $w$ , so arranged that when the crank-levers are in their normal or upper positions all the shoulders  $w$  will be parallel to and just above the plane of the upper face of the strip D, as shown in Fig. 3, but this shoulder of each crank-lever will be above an opening  $y$  in the said strip.

It will be apparent that if when the parts are in the position shown in Figs 2 and 3 a key is depressed and the strip D is moved in the direction of its arrow in said figures the solid portions of the strip will be brought beneath the bearings or shoulders  $w$  and of the keys that have not been moved constitute bearings  $u$  to engage said shoulders. The

strip D therefore serves as a means of locking all the series of keys that have not been operated upon as well as for locking down the key of each series which have been operated upon. Further, when the keys are all elevated and strip D is pulled forward, as occurs in certain operations of the machine, the keys are all then locked in their elevated position.

It will be apparent that any one of the keys of a series may be depressed to lock the lever C when the parts are in their normal positions—as, for instance, the key 6, Fig. 1—but it will be evident that after the key has been depressed, as shown in Fig. 1, and the strip D thereby carried back to the position shown in Fig. 1, all of the other keys will be locked in their upper position, so that they cannot be depressed, and it will therefore be impossible to occasion any error by successively depressing two or more keys in the same series.

After a key has been depressed it is desirable that it shall remain in that position until the registration has been effected, and when there are restoring-springs 14, as before described, it is also necessary to hold the strip D in its position, as otherwise the action of the spring of the lever that has been depressed would restore the parts to their original positions. For this reason I make use of some kind of a detent for holding each strip D in the position to which it is set by depressing the key. For instance, I make use of a pawl E, with a spring 18 to actuate it, Fig. 1, and with a lug 17, which engages a stop or shoulder 19 upon the strip D, when the latter is carried to its upper position, and thereby prevents its return.

After a number has been registered or printed it is desirable to unlock the keys, and this is effected upon the entire body of keys simultaneously by lifting all of the pawls E. This may be done through the medium of any suitable appliances—as, for instance, through the medium of a cross-bar 20, carried by the arms of a locking-lever on the shaft 21, which is operated from the totalizing or resetting key 1, Fig. 2, by depressing the said key.

It will be seen that by the arrangement above described I am enabled to dispense with the devices heretofore employed for locking the keys in their lower positions. Such devices have generally consisted of notches in the key-stems, with spring-detents slipping into said notches when the keys are depressed and creating a great amount of friction, necessitating the application of considerable force for the purpose of depressing the keys and of a still greater force when a large number of keys have to be elevated against the resistance of the detents.

It will be evident that the restoring-bar 20 may not only be operated by means of the totalizing or resetting key 1, but from any other part of the machine—as, for instance, by those parts which are carried back to their

original position after the printing or recording or indicating of a number. If the ends of the stems 12 of the keys rested for their whole width upon the shoulder  $x$ , there would be a certain amount of friction in depressing the keys. By beveling the lower ends of these stems, as shown, the friction is reduced to a minimum. An equivalent of this would be to make the lower ends of the stems at right angles to the line of the stems and to make each of the faces or shoulders  $x$  upon an incline, so that normally when in their upper positions the lower end of the stem and the corresponding face of the crank-lever would be at an angle to each other instead of parallel. It would also be possible to make the lever C and the stem 12 in one piece.

While I have shown and prefer the arrangement of the keys and levers and strip before described this is not absolutely essential. For instance, I can make use of the arrangement shown in Fig. 5, in which there is a strip D' with a series of inclined side grooves  $s$ , one beneath a pin 22, projecting from the side of the stem of each key, so that when a key is depressed the strip D' is moved in the direction of the arrow, thereby bringing a solid bearing portion of the strip beneath the bearing-pins 22 of the other keys.

In the arrangement shown in horizontal plan in Fig. 6 there is a series of sectors F, each pivoted at 25 beneath the key-plate and each having a notch or recess  $y$ , and all connected by a bar G. Each key-stem 12 is pointed at the lower end, so as normally to bear against one side of the notch  $v$  when a key is depressed to throw the sector in the direction of its arrow, Fig. 6, together with all the sectors. The other sectors are thus carried beneath the other stems to present bearings which prevent these keys from being depressed.

Without limiting myself to the precise construction and arrangement of parts shown, I claim as my invention—

1. In a calculating-machine the combination of the indicator devices and different series of independent keys, a single locking device for each series of keys, independent of the means for transmitting motion to the indicating devices, and connections whereby the locking device is operated on depressing any key of its series to thereby lock in position all of the keys of said series, substantially as set forth.

2. In a calculating-machine, the combination with different lines of independent keys, of a single locking-strip extending longitudinally beneath each line of keys and constructed to be operated on the depression of any key of the line to lock the said key in its depressed position and the remaining keys of the line in their normal positions, substantially as described.

3. In a calculating-machine, the combination with different lines of independent keys, of a single locking-strip extending beneath

each line of keys, and means whereby on the depression of any key of the line the strip is positively operated to lock said key in its depressed position and the remaining keys of the line in their normal positions, substantially as described.

4. In a calculating-machine, the combination with different lines of independent keys, of a single locking-strip extending beneath each line of keys, and means whereby on the depression of any key of the line the strip is moved a uniform distance to lock the said key in its depressed position and the remaining keys of the line in their normal positions, substantially as described.

5. The combination with a series of indicators and keys of a calculating-machine, of locking devices for the keys adapted to be operated by the depression of any one key for locking the remaining keys of the series in their elevated position, means for positively retaining the locking devices in their locking positions, and means for simultaneously positively lifting the keys and restoring the said locking devices to their normal positions, substantially as described.

6. The combination of the different series of keys of a calculating-machine, locking means for each series of keys, independent of the indicator-operating devices operated from the keys, devices whereby the locking means of any series are shifted to lock all the keys on depressing any one key of a series, and detents for retaining all the locking means in position after adjustment, substantially as described.

7. The combination of the different series of keys of a calculating-machine, locking means for each series of keys, devices whereby the locking means are shifted to lock the elevated keys on depressing any one key of

a series, detents for retaining all the locking means in position after adjustment, and means for disengaging all the detents simultaneously, substantially as described.

8. The combination with a slotted or recessed locking-strip, of a series of keys adapted to be depressed through the slots of the locking-strip and to engage with an edge of the slot to shift the locking-strip and bring bearing-surfaces beneath the keys to prevent their movement after any one of them has been depressed, substantially as described.

9. The combination in a calculating-machine, of series of keys, series of levers arranged to be operated by the keys, a strip adjacent to each series of levers and adapted to be shifted independently of the indicator devices, means for shifting a strip on the depression of any key of a series, and bearings on the strips and levers arranged to engage on the shifting of the strips, substantially as described.

10. The combination of a series of keys, levers arranged below the keys with bearing-faces  $x, w$ , the face  $x$  being adapted to be engaged by the keys strips  $D$  having slots  $y$ , and bearing-faces  $u$ , adapted to be engaged by the bearing-faces  $w$  and projections on the levers extending into the slots, substantially as described.

11. The combination of the keys, levers  $C$ , slotted strips  $D$ , detents for said strips, and means for simultaneously operating said detents, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HENRY PIKE, JR.

Witnesses:

JOHN T. CALEF,  
EDMUND G. LANGHORNE.