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PATENTED MAR. 10, 1908.

W. P. QUENTELL.
CALCULATING OR ADDING MACHINE.

APPLICATION FILED NOV. 27, 1906.

2 SHEETS—SHEET 1.

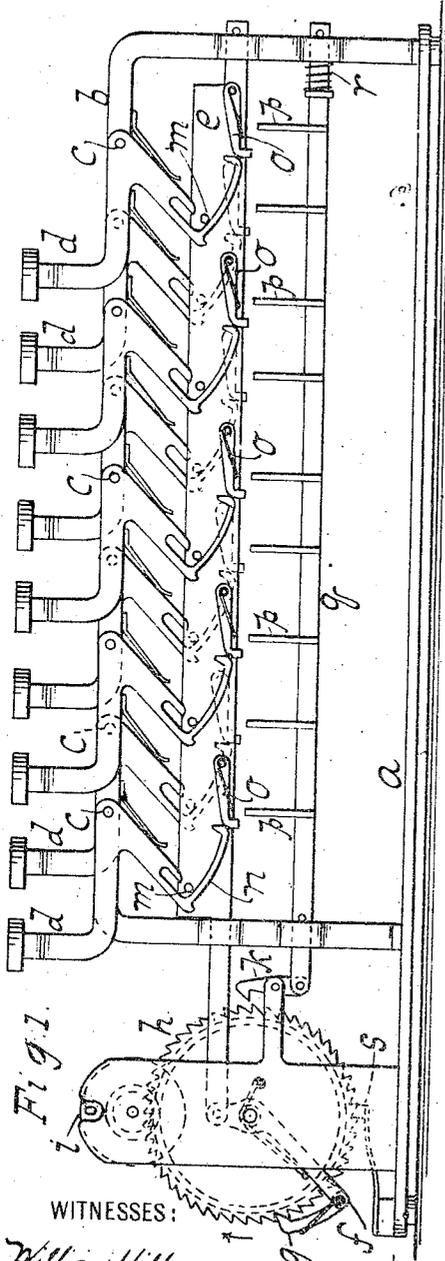


Fig. 1.

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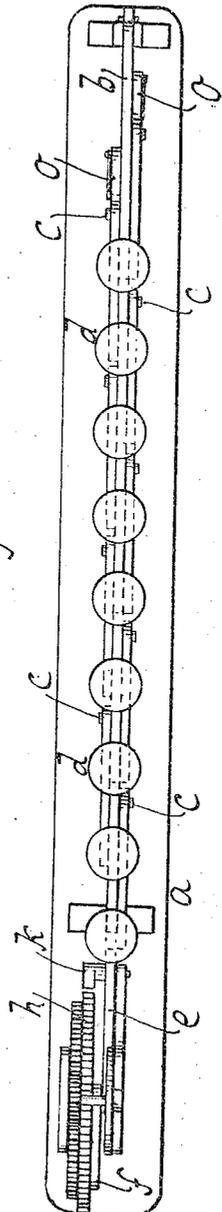


Fig. 2.

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2 SHEETS—SHEET 2.

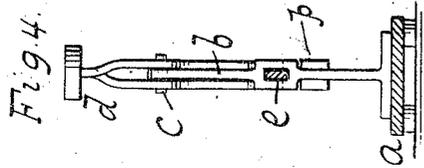


Fig. 6.

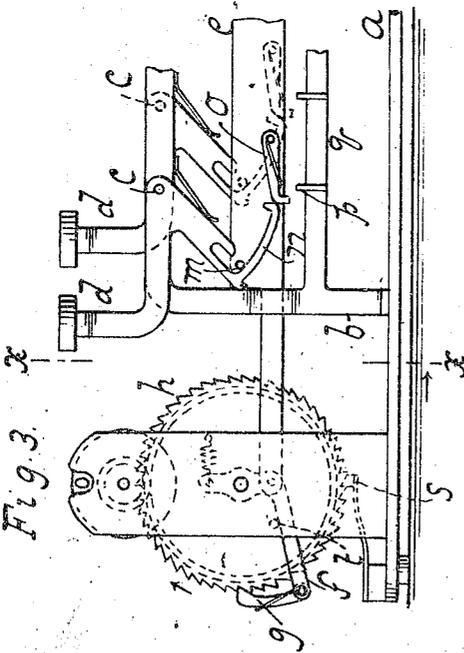
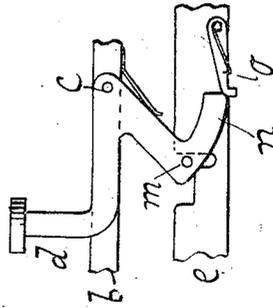


Fig. 5.

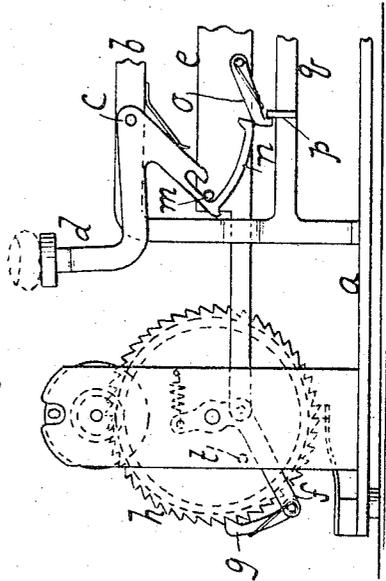
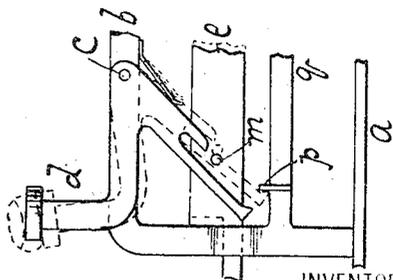


Fig. 7.



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CALCULATING OR ADDING MACHINE.

No. 881,717.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed November 27, 1906. Serial No. 345,307.

To all whom it may concern:

Be it known that I, WILLIAM P. QUENTELL, a citizen of the United States, residing at Manhattan borough, in the city, county, and State of New York, have invented new and useful Improvements in Calculating or Adding Machines, of which the following is a specification.

This invention relates to machines for accurately adding or calculating, particularly in preventing overcount, and the invention resides in the novel features of construction set forth in the following specification and claim and illustrated in the annexed drawing in which:

Figure 1 is a face elevation of a calculating machine embodying this invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 shows a modification. Fig. 4 is a section along $x-x$ Fig. 3. Fig. 5 shows parts of Fig. 3 in a different position. Fig. 6 shows a further modification. Fig. 7 shows a further modification.

In this drawing is shown a base or support a with frame b having fulcrums or pivots c for levers or keys d . The keys engage a movable bar e which actuates a suitable connection or actuator such as a lever f with pawl g engaging suitable mechanism as for example a ratchet h . The latter can be connected in any suitable way to number or counting disks indicated at i and which can be of any well known construction.

A lock for the ratchet is shown at k which is also operated by the movable bar e as presently explained. The engagement of the keys and bar e can be made by suitable pin and slot connection. In Fig. 1 the keys are shown slotted or forked and the bar has studs or pins m while in Fig. 6 pins are shown on the keys and the bar has slots or recesses for the reception of the pins. Such transpositions of parts are included in the invention as will be obvious.

The keys are shown with tails or arms n which as the key is actuated engage tumblers or stop parts o and depress or move the same so as to be arrested against the stops or stop pins p as the bar is moved or slid by the key. A rapid operation or quick blow on the key will not cause the resulting impetus to carry the bar e beyond the proper limit since a tumbler o coming to a stop p will prevent excessive or inaccurate movement of the bar.

It can also be noted that the engagement of a pin m with its respective fork or slot will prevent excessive or inaccurate motion of the bar or transmission mechanism connected to or actuated by such bar.

The tumblers o form stopping means on the bar which stopping means are depressed or moved to stopping position before the key moves the bar. A certain space is shown between the pin m and its contacting part when the device is at rest. When a key is depressed the tail n at once depresses or engages the stopping tumbler o and after the tumbler has been moved to engaging position the pin m is engaged to move the bar. Such bar cannot therefore carry the tumbler in question past or over the stop as such tumbler is depressed before the bar begins to move.

The stops p are shown on a bar q which when given a slight movement will actuate the lock k connected to the stop bar. A returning spring for the bar is shown at r . Returning springs are also applied where required as for example to the keys, the tumblers and so on.

The operation of the device is readily understood. As a key is actuated its tail n moves the corresponding tumbler to stopping position and the key engaging bar e and moving the same moves pawl g and said bar e by its tumbler o engaging stop p also moves bar q so as to bring the lock k to the ratchet when the key is depressed. A sudden blow or tap on the key can thus not excessively rotate the ratchet h since the lock k comes into action as the bar e is stopped by the stops p .

The stops p are arranged to arrest the mechanism at various points. For example the stop at the extreme left is shown as allowing the calculating mechanism to be moved the extent of only one tooth or figure while the other stops are calculated or set for allowing movement to the extent of other numbers as for example two or nine or otherwise. The tumblers o being set at various distances from stops p the bar e has to move various extents before being arrested or stopped. The stop bar q however in each case being moved only at the closing part of the movement of the bar e is only actuated sufficiently to set the lock k in action. The

bars *e g* are shown parallel or alongside one another and a compact structure embodying this invention can be made. A retaining pawl can be applied as shown at *s*, but this forms no part of the invention.

In Fig. 1 the device is such that a depression of a key actuates the adding or calculating mechanism. In Fig. 3 is shown a device where calculating is done on the return of the key. The bar *e* in Fig. 3 when actuated by the key retracts the pawl *g* (Fig. 5) which latter on the return of the key and bar actuates the ratchet or counter. An arresting or locking pin for the pawl is shown at *t* in Fig. 3. This stop pin *t* is secured to a fixed part, such as one of the risers or frame pieces forming a bearing for the shaft of the ratchet *h*.

The stop bar *q* or stops *p* in Fig. 3 are shown fixed or not made to actuate a lock.

The keys as seen in Fig. 4 are alternately made to extend on opposite sides of the bar *e*. This arrangement allows the parts to be assembled close to one another without interfering. As each key on actuation interlocks with the movable bar inaccurate or irregular movement is prevented.

The tumblers *o* can be omitted as the bar *e* becomes locked to the key through the pin and slot connection and any excessive movement of the key *e* would bring or drag the tail of the key or lever to contact with the stop *p*.

The tumblers *o* are of advantage over slot and pin lock and stop as the tumblers insure absolute accuracy whereas a pin and slot while accurate enough for a machine where the parts move considerable distances would not be as accurate in a machine where the parts move a very short distance on account of the play required between slot and pin parts for easy movement.

I claim—

1. A calculating machine comprising a frame, a sliding bar mounted in the frame, a series of pivots fixed to the frame at different points in proximity to the sliding bar, key levers fulcrumed on the pivots and directly contacting at one end with the bar to slide the latter in direction of swing of the lever, an actuator composed of a ratchet and pawl driven by the sliding bar, tumblers on the sliding bar and actuated by the keys, and a lock for the actuator actuated by the tumblers.

2. A calculating machine comprising a ratchet, key levers, a movable bar actuated by the levers, stopping means on the bar for arresting such bar and engaged by the key levers, and an actuator for the ratchet and lock for the ratchet actuated by the movable bar.

3. A calculating machine comprising key levers, a movable bar engaged by the key

levers, a tumbler, a stop, an actuator composed of a ratchet and pawl and moved by the bar, a computing mechanism driven by the actuator, and a lock for the actuator actuated by the movable bar through the tumbler and stop, said key levers having a part made to bring the tumbler to engagement with the stop.

4. A calculating machine comprising key levers, a movable bar engaged by the levers, tumblers on the bar, stops for arresting the bar, means for bringing the tumblers to stop engaging position in advance of the movement of the bar, and an actuator driven by the movable bar, and a lock for the actuator actuated by said movable bar through the medium of the tumblers and stops.

5. A calculating machine comprising key levers, a movable bar actuated by the levers, tumblers on the bar, stops for arresting the bar, means for positioning the tumblers to engage the stops, an actuator driven by the bar, and a lock for the actuator actuated by the stops as the latter are engaged and actuated by the tumblers.

6. A calculating machine comprising key levers, a movable bar engaged by the key levers, tumblers on the bar, stops for arresting the bar, an actuator moved by the bar, a lock for the actuator moved by the bar through the tumblers and stops, said key levers having portions made to engage the tumblers to move the same to position to engage the stops.

7. A calculating machine comprising keys having arms and branches, a movable bar having pins engaged by the arms, and tumblers engaged by the branches, a stop bar for arresting the movable bar and engaged by the tumblers, and an actuator driven by the key actuated bar and a lock for the actuator and actuated by the stop bar.

8. A calculating machine comprising a movable bar and a stop bar for arresting the movable bar, tumblers on the movable bar, key levers for actuating the movable bar and provided with tail pieces to engage the tumblers, and an actuator moved by the key actuated bar.

9. A calculating machine comprising a movable bar having tumblers thereon and a series of stops alongside the bar for arresting said bar and carried independently thereof, studs along the bar, levers arranged to engage the studs and move the bar, arms carried by the levers to move the tumblers to stop engaging position, and an actuator moved by the bar.

10. A calculating machine comprising a movable bar having tumblers thereon and a series of stops alongside the bar for arresting said bar and carried independently thereof, studs along the bar, levers arranged to engage the studs and move the bar, arms car-

ried by the levers to move the tumblers to stop engaging position, and an actuator moved by the bar, said levers having a forked portion to lock through the studs to the movable bar.

11. A calculating machine comprising a set of levers having forks and tails, a movable bar having studs and tumblers engaged respectively by the forks and tails, stops to which the tumblers are moved, and an actuator moved by the bar.

12. A calculating machine comprising levers having tails, a movable bar actuated by the levers and having tumblers engaged by the tails of the levers, a stop bar alongside the first bar and to which the tumblers are moved by the tails of the keys, and an actuator driven by lever actuated bar and a lock for the actuator and actuated by the stop bar.

13. A calculating machine comprising a movable bar, a series of stops placed alongside of and in a row running parallel to said bar, and levers having locking engagement with the bar and arrested by the stops.

14. A calculating machine comprising a sliding bar, swinging levers, an actuator moved by the bar, and computing mechanism moved by the actuator, said levers and bar being made to directly interlock.

15. A calculating machine comprising a movable bar, levers, and an actuator moved by the bar, said levers having slots each extended from one end of the arm of the respective lever toward the fulcrum and the bar having pin portions for interlocking with the slotted arms.

16. A calculating machine comprising key levers, a movable bar directly engaged by the levers, computing mechanism, means for connecting the computing mechanism with the bar, a stop for arresting the bar, and means on the bar and moved by the key for engaging the stop.

17. A calculating machine comprising key levers, a movable bar engaged and actuated by the key levers, a series of stops placed alongside of and clear of the bar, tumblers on the bar, which tumblers are moved by the keys to engage the stops, an actuator moved by the bar, a lock for the actuator connected to and moved by the stops as the latter are moved by the tumblers, and bar interlocking parts on the keys for preventing excessive movement of the bar.

18. A calculating machine comprising keys, a movable bar actuated by the keys, stopping means on the bar engaged by the keys in advance of their engagement with the bar, stops for arresting the bar, an actuator actuated by the movable bar, and a

lock for the actuator and actuated through the stops.

19. A calculating machine comprising key levers, a movable bar having tumblers and engaged by the key levers, a stop, and an actuator and lock for the actuator respectively actuated by the bar and stop, said key levers having a part made to move the tumblers to engage the stop in advance of the engagement of the bar.

20. A calculating machine comprising key levers, a movable bar engaged by the key levers, tumblers on the bar, stops for arresting the movable bar, a stop supporting bar, and an actuator and lock for the actuator respectively engaged by the movable bar and stop supporting bar, said key levers having parts made to engage the tumblers and move the same to stop engaging position in advance of the movement of the bar.

21. A calculating machine comprising key levers, a movable bar actuated by the same, and a stop composed of tumblers and arresting studs, said tumblers being pivoted to the movable bar intermediate the key levers and studs.

22. A calculating machine comprising key levers, a movable bar actuated by the levers, tumblers mounted on the bar, stops mounted in proximity to the bar and which stop the bar through the tumblers when the bar is actuated by the key, and an actuator actuated by the movable bar.

23. A calculating machine comprising keys, a movable bar engaged by the keys, tumblers intermediate the keys and bar and mounted directly on such bar, means for bringing the tumblers to active position, stops engaged by the tumblers, and an actuator actuated by the bar.

24. In a calculating machine, an actuator, a movable bar connected thereto, tumblers carried on said bar, stops for arresting said bar through the tumblers, and means for moving the tumblers into operative position and for moving said bar.

25. A calculating machine comprising an actuator, a movable bar for driving the actuator, tumblers carried on said bar, stops for arresting the movement of the bar through the tumblers, and means for moving the bar and for bringing the tumblers into stop engaging position.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM P. QUENTELL.

Witnesses:

EDWARD WIESNER,
CHRISTIAN ALMSTEAD.