No. 883,719. PATENTED APR. 7, 1908.

K. KARASEK & J. AUMUND.

ADDING MACHINE.

APPLICATION FILED MAR. 17, 1906.

Fig. 1.

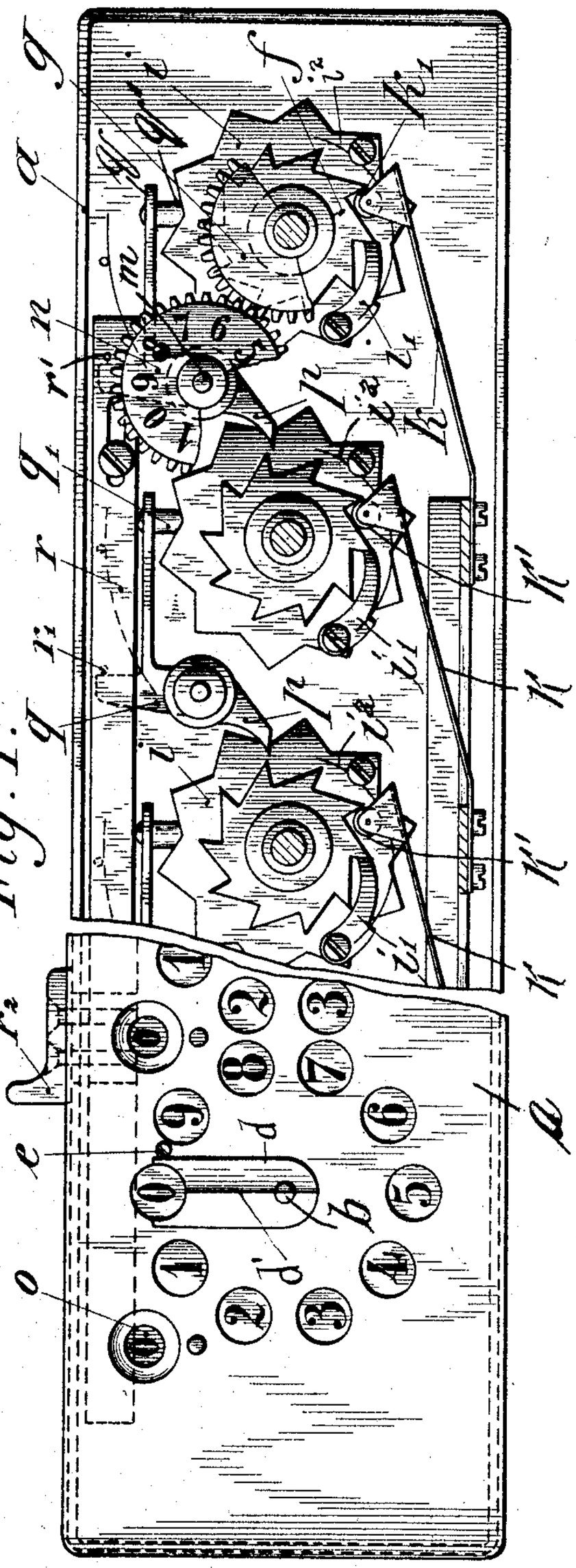


Fig. 3.

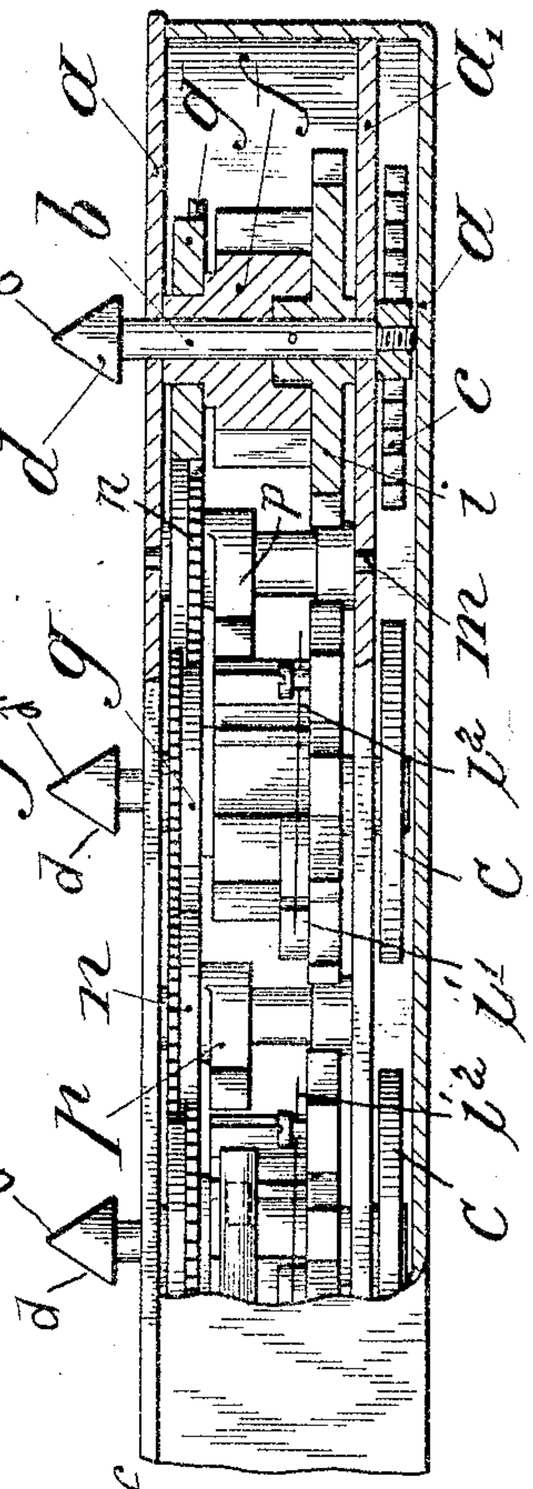
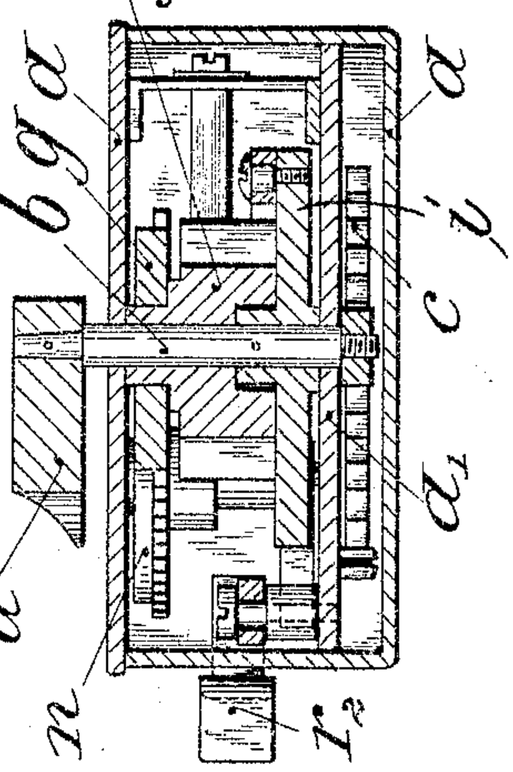


Fig. 2.



Witnesses:-
Isaac Shira
Clarissa Franck

Inventors:-
Karl Karasek
Johannes Aumund
by Otto Munn
their Attorney

UNITED STATES PATENT OFFICE.

KARL KARASEK AND JOHANNES AUMUND, OF ZURICH, SWITZERLAND.

ADDING-MACHINE

No. 883,719. Specification of Letters Patent. Patented April 7, 1908.

Application filed March 17, 1906. Serial No. 306,528.

To all whom it may concern:

Be it known that we, KARL KARASEK and JOHANNES AUMUND, citizens of Switzerland, residing at Zurich, Switzerland, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

The present invention relates to adding machines of that class, in which a movable figure-disk is provided for each figure of a number to be added.

In adding machines of this character as heretofore constructed, it was necessary to look for the desired number upon a circular figure plate, and then to turn the latter against a pin or stop. This operation requires the use of the eye, and the operator must either bear in mind the number to be added until the addition is completed, a likely source of error, or, the operator must frequently look from the written figure to the machine, occasioning a loss of time, and likewise tending to cause errors.

The apparatus forming the object, of the present invention may be readily operated, without the necessity of the operator looking at the apparatus, and includes means for proving the accuracy of the addition after completion of the adding operation.

In the accompanying drawing, wherein one embodiment of the invention is illustrated, Figure 1 is a front view of the apparatus, partially in section. Fig. 2 is a cross sectional view; and Fig. 3 is a top plan view with part of the casing removed, and parts of the apparatus being shown in section.

The mechanism for each place of a number to be added is alike, and but one set of mechanism is described in the following specification.

Referring to the drawing, *a*, designates a casing, at a suitable point of which a shaft *b*, is journaled, the shaft being connected to a spiral spring *c*, below a wall or diaphragm a^1. The shaft *b*, projects outside of the casing *a*, and is provided at its free end with a crank *d*, which is held, by spring action against the pin *e*, upon the front of the casing. The crank *d*, travels over a dial upon the casing, upon which numbers from 0 to 9 appear. The crank normally points to 0 upon the dial.

Within the casing, and loosely mounted upon the shaft *b*, on a common sleeve or nave, is a ratchet wheel *f*, and a gear wheel *g*. The shaft *b*, also carries a star wheel *i*, upon which a pawl i^1, held by a spring i^2, is secured, said pawl coöperating with the ratchet wheel *f*. The ratchet wheel *f*, serves as means for locking the adding mechanism in position, said wheel *f*, being locked by a spring *k*, carrying a roller k^1, which engages the teeth of the wheel *f*.

Mounted upon a shaft *m*, is a disk or wheel *n*, provided with teeth upon its periphery, equal in number to the teeth of the gear wheel *g*, the teeth of the wheels *n* and *g* being designed to mesh. The wheel *n*, is provided upon its face with a series of figures from 0 to 9, one of which is always visible through the opening 0 in the dial upon the casing *a*. There is also mounted upon the shaft *m*, a dog *p*, which operates the ratchet of the next succeeding group of wheels and is adapted to advance the tens group of figures. Furthermore, there is loosely mounted upon the shaft *m*, a lever *q*, having a nose q^1, which exerts a spring pressure upon the star wheel *i*.

Arranged above the lever *q*, is a displaceable rail *r*, common to the several groups of gear wheels, said rail being provided with pins r^1, and a handle r^2, which projects outside the casing *a*, and may be operated by hand.

The operation of the invention is as follows:—Assuming that several figures are to be added, of which 4 is the first, the unit crank *d*, which is caused normally to point to 0 by the spring *c*, is turned to the figure 4 on the dial and is then released. By turning the crank, the star wheel *i*, is also caused to turn, and the nose q^1 of the lever *q*, glides over the teeth of wheel *i*, and drops into the proper position between two teeth, thus, holding the crank and figure-disk in the predetermined position. The spring action of the lever *q*, also serves to correct any slight inaccuracy of operation; if the crank *d*, is turned beyond a number the nose q^1 will fall between the teeth of the ratchet wheel and draw the crank back so that it stands exactly over the desired number. The turning of the crank *d*, causes the pawl i^1 of the wheel *i*, to turn the wheels *f* and *g* the same distance as the wheel *i*, and as the wheel *g* is in mesh with the wheel *n*, the latter is turned a sufficient distance to cause the figure 4 to appear under the opening 0 upon the dial. If

now, the handle r^2 is moved to the left, the rail r is drawn backwards, causing the pin r^1 to tilt or trip the lever q, thus lifting the nose q^1 against the tension of q out of engagement with the wheel, and permitting the spiral spring c to return the shaft b with the star wheel i, and crank d to their initial position. During the return travel of the crank d, the pawl i^1 glides over the teeth of the wheel f, and the roller k^1 upon the spring k, which engages a tooth of wheel f, holds the latter firmly locked, and also holds the figure-disk in position.

If it is desired to add the figure 6 to the figure 4, the units crank is turned to the figure 6 upon the dial. The wheel n, thus completes the revolution theretofore begun, and the dog p engages one tooth of the wheel f of the tens gearing and advances this wheel one tooth. There then appears under the opening of the tens dial the figure 1 and at the opening of the units dial the figure 0. After the completion of this revolution, the dog p is disengaged from the tens wheel f, which may then again be independently operated.

One of the novel and important features of our invention is the form which we give the cranks d which serve as indices or pointers. In adding machines as heretofore constructed, the cranks were usually provided with a knob or rounded end, which it was necessary to grasp with two fingers, and consequently gave no indication in which direction the crank was pointing. According to our invention, however, we provide each crank with an upwardly extending, longitudinal rib d^1, so that the operator may, by placing his thumb on this rib, operate the crank, and have his other fingers free to grasp or rest upon the edge of the machine. In moving the crank, the longitudinal rib d^1 moves under the operator's thumb, and in this manner the operator is enabled by "feel" to accurately determine the direction in which the crank points, thus obviating the necessity of his looking at the machine at each turn of the crank.

In releasing the tension of the lever q, by which action the nose q^1 is caused to drop, at each advance, behind a tooth of the star wheel, a decided resistance of the crank d, may be felt, by means of which the latter may be more readily placed in the desired position by touch. By aid of the arrangement above described it is also possible to examine the position of the several indices, which remain in their respective positions until all are simultaneously released, and thus determine the accuracy of the operation and if necessary to correct any figures erroneously set.

It will be understood that the invention as above described is susceptible of modification in several particulars, and that such modifications are deemed to be included within the scope of the appended claims.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:—

1. In an adding machine, the combination of a series of shafts, a figure disk upon each shaft, a second series of shafts each of which is provided with gearing for operating its succeedingly adjacent figure disk, and a detent upon each shaft of said first series for engaging the gearing upon the preceding shaft, substantially as described.

2. In an adding machine, the combination of a series of shafts, a peripherally toothed figure disk upon each shaft, a second series of shafts each of which is provided with gear wheels of which one is adapted to mesh with and rotate the next succeeding figure disk, and a detent upon each shaft of said first series for engaging the gearing upon the preceding shaft after the same has rotated one of said figure disks, substantially as described.

3. In an adding machine, the combination of a series of shafts, a figure disk upon each shaft, a second series of shafts each of which is provided with gearing for operating its succeedingly adjacent figure disk, a detent upon each shaft of said first series for engaging the gearing upon the preceding shaft after the same has rotated one of said figure disks, and means for tripping the said detents, substantially as described.

4. In an adding machine, the combination of a series of shafts, a figure disk upon each shaft, a second series of shafts arranged at a lower horizontal plane than said first series, gearing upon each shaft of said second series adapted to operate the figure disk upon the next succeeding shaft of said first series, and a detent upon each shaft of said first series adapted to engage the gearing upon the preceding shaft of said second series after the same has rotated one of said figure disks, substantially as described.

5. In an adding machine, the combination of a series of shafts upon each of which a peripherally toothed figure disk is mounted, a second series of shafts each of which carries a rigidly fixed star wheel, and a loosely mounted ratchet wheel and gear wheel, the latter being adapted to mesh with an adjacent figure disk, means for rotating said several gear wheels to impart rotary motion to said figure disks, a detent upon each shaft of said first series for engaging the preceding star wheel, and means for tripping said detents after the figure disks have been set, substantially as described.

6. In an adding machine, the combination of a casing, a series of shafts journaled therein, a peripherally toothed figure disk upon each said shaft, a second series of shafts journaled in said casing, each shaft of said second series carrying a rigidly fixed star wheel and

a loosely mounted ratchet wheel and gear wheel, the latter being adapted to mesh with an adjacent figure disk, means for rotating said several gear wheels to impart rotary motion to said figure disks, a detent upon each shaft of said first series for engaging the preceding star wheel, means for releasing said detent from engagement with the star wheel, and means for locking said ratchet wheel to prevent reverse rotation of said figure disks, substantially as described.

7. In an adding machine, the combination of a series of shafts upon each of which a figure disk is mounted, a second series of shafts carrying gearing adapted to operate said figure disks, a detent upon each shaft of said first series reaching into engagement with the gearing upon the adjacent preceding shaft of said second series, and a dog upon each shaft of said first series being adapted to partially turn the next succeeding shaft when the shaft upon which said dog is mounted makes a complete revolution, substantially as described.

8. In a device of the character described, the combination of a shaft carrying a star wheel and a gear wheel, a figure-disk having teeth adapted to mesh with said gear wheel, means for releasing said star wheel when said figure disk has been set, and means for holding said figure disk in set position.

9. In a device of the character described, the combination of a shaft carrying toothed wheels, a second shaft carrying a figure disk adapted to be revolved by the wheels on said first shaft, and a lever upon said second shaft, said lever being provided with a nose adapted to engage the teeth of one of the wheels upon said first shaft.

10. In a device of the character described, the combination of a series of shafts, each carrying toothed wheels, a second series of shafts, each having a figure disk and a lever mounted thereon, and a rail common to all the levers, said rail being provided with means for tripping the several levers.

11. In a device of the character described, the combination of a series of shafts, each carrying a star wheel, and a loosely mounted gear wheel and ratchet wheel, a second series of shafts, each of which is provided with a figure disk having peripheral teeth designed to mesh with the next preceding gear wheel, a lever provided with a nose, upon each shaft of said second series means for advancing said figure disks by rotation of the star wheels means for holding said figure disks in set position, and means for releasing and returning to initial position said star wheels.

12. In an adding machine of the character described, the combination of indicating means, an operating device for said means, comprising an arm movable in a circular path and formed on its upper surface with a vertical, longitudinally extending rib having downwardly inclined sides and of a length substantially co-extensive with that of the arm, said rib being of substantially a uniform height.

13. In an adding machine of the character described including indicating mechanism and a dial, of an operating device for the indicating mechanism comprising a crank arm pivoted centrally of the dial and serving as a pointer in connection with said dial, said arm being formed on its upper surface with a centrally located, longitudinally extending rib of a length substantially coextensive with the length of the arm, said rib having downwardly inclined side faces.

14. In a device of the character described, the combination with a series of dials, of cranks adapted to travel thereover and to be set at any desired point thereon, and means for simultaneously releasing said cranks and permitting the same to return to initial position, substantially as described.

15. In a device of the character described, the combination with a series of dials, of cranks adapted to travel thereover and to be set at any desired point thereon, and means for simultaneously releasing said cranks from their set position, said means comprising a longitudinally reciprocable rail provided with stops at intervals thereon, substantially as described.

16. In an adding machine of the character described including indicating mechanism and a dial, of an operating device for the indicating mechanism comprising a crank arm pivoted at one end centrally of the dial and serving as a pointer in connection with said dial, said arm being formed on its upper surface with a longitudinally extending rib, substantially coextensive with the length of the arm and of substantially a uniform height.

In testimony whereof we affix our signatures in presence of two witnesses.

KARL KARASEK.
JOHANNES AUMUND.

Witnesses:
H. Y. HÜLLER,
A. LIEBERKNECHT.