A. J. MEIER.

CALCULATING MACHINE.

APPLICATION FILED FEB. 12, 1908.

928,873.

Patented July 20, 1909.

2 SHEETS—SHEET 1.

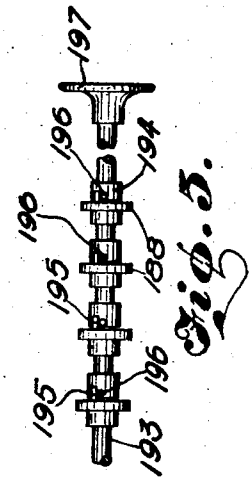


Fig. 5.

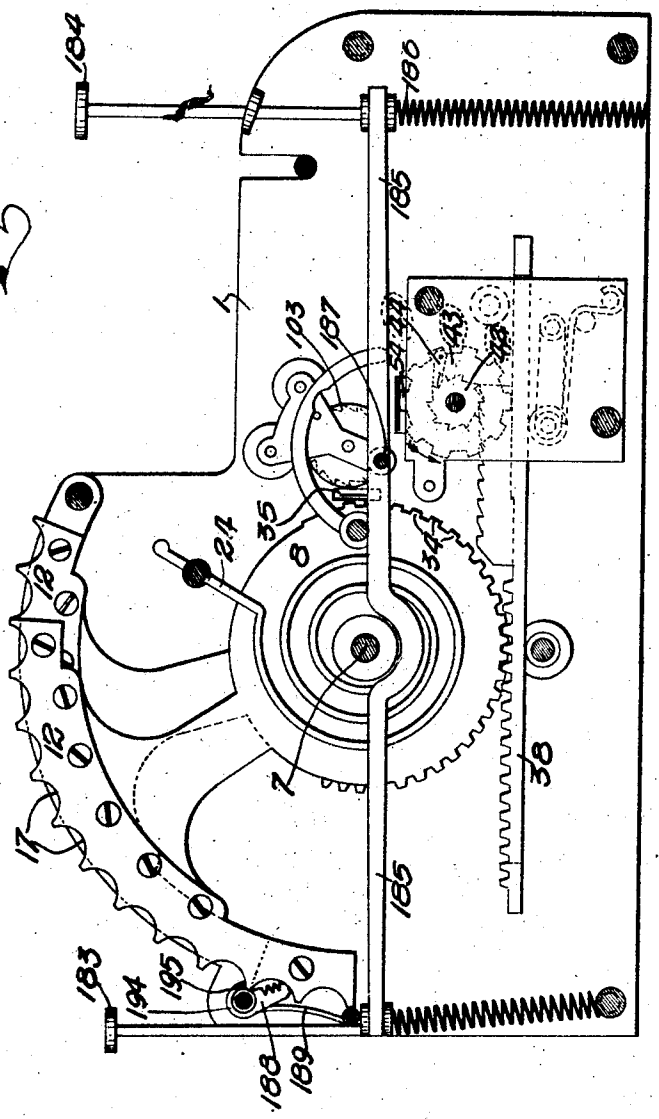


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

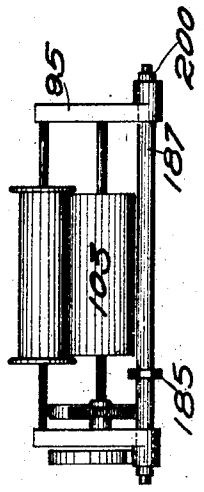



Fig. 3.

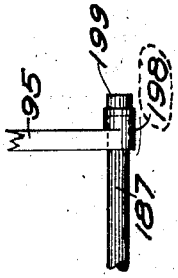
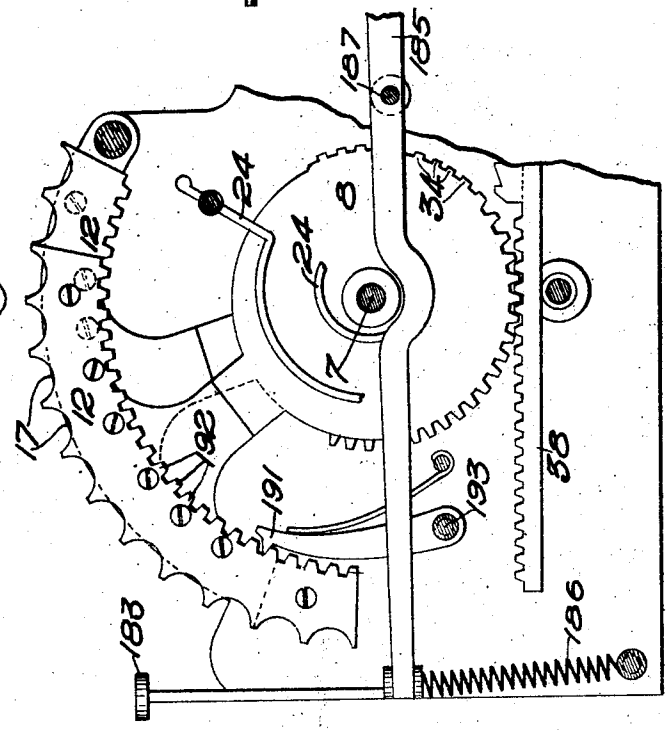



Fig. 2.

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# UNITED STATES PATENT OFFICE.

ALBERT J. MEIER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO DUPLEX ADDING MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## CALCULATING-MACHINE.

No. 928,873. Specification of Letters Patent. Patented July 20, 1909.

Original application filed September 18, 1907, Serial No. 393,494. Divided and this application filed February 12, 1908. Serial No. 415,507.

*To all whom it may concern:*

Be it known that I, ALBERT J. MEIER, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for mechanically adding items or numbers into an aggregate or total, and embodies a number of improvements adapted to be used in the adding-machine invented by Adolphus G. Meier, and described and shown in his pending application Serial Number 330,278, filed August 13, 1906, the subject-matter of this application having been divided from my own pending application, Serial Number 393,494, filed September 18, 1907. It should be understood, however, that, so far as the invention herein described and claimed is concerned, the aforesaid machines are merely illustrative and that this invention may be applied to any calculating-machine which embodies either one set of type to print the items to be added and another set to print the totals of such items, or a single set of type printing items or totals (or both).

In the drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a longitudinal sectional view of one form of the machine; Fig. 2 is a longitudinal sectional view of another form of the machine; Fig. 3 is a detailed view of a modified form of the platen-supporting mechanism; Fig. 4 is an elevation of the platen and the parts supporting same; and Fig. 5 is a detailed view of the mechanism for releasing the registering keys which have been depressed.

The aforesaid application of Adolphus G. Meier fully describes the construction and operation of the various parts of the adding-machine in connection with which the improvements forming the subject-matter of this application are herein shown as being used, and such of those parts as are herein mentioned are referred to only briefly. In each application the same reference numerals are used to designate parts which are common to the two machines, while parts peculiar to this invention and not shown in said former application are designated by reference numerals higher than any used in said other application.

Briefly to describe the general *modus operandi* of the machine, it may be said that the listing type 34 carried upon the peripheries of sectors 8 are raised to printing position (opposite ribbon 35) by depression of keys 12, which keys cause the sectors to rotate upon shaft 7. The sectors, when thus rotated, give a forward thrust to rack-bars 38, which, meshing with the ratchet-wheels 42 secured to the adding-wheels 43, revolve said adding-wheels in the direction indicated by the arrows, and cause the total-printing type 54 thereupon to be exposed to ribbon 55. After each item it set up by depression of the appropriate key or keys, said item is printed by moving platen 103 against type 34 and, when all the items to be added have been listed and printed, the total is taken by moving the platen against type 54. So far as this invention is concerned, however, the nature of the means for rotating the adding-wheels is immaterial.

For the purpose of rocking the platen 103 into engagement with the type on sectors 8 and adding-wheels 43, keys 183 and 184 are provided, said keys being, respectively, at the front and back of the machine. Each key is connected to a lever 185 which lever rocks the shaft 187 to which the rocker-arms 95 are secured, the platen being journaled in said rocker-arms. Shaft 187 is journaled in perforations in the side-plates 1, said shaft being provided with shouldered heads 200, which bear against the inner side of plates 1 so as to prevent slipping of the shaft. If desired, however, the shaft 187 may merely be forced into sockets 198 on the inner sides of rocker-arms 95, said arms being provided with projecting bosses 199 which project into said side-plate perforations. The lever 185 may be secured to shaft 187 in any desired manner. Depression of key 183, accordingly, rocks the platen so that it bears against the sectors 8, that position being shown in Fig. 1, while depression of key 184 causes the platen to engage the adding-wheels 43. Obviously, the items, when registered by depression of the key or keys 12, are printed by the act of the operator in depressing key 183, and the total is taken at any time by depressing key 184, springs 186 fastened to the bottom of the casing and to

lever 185, returning said lever and platen to normal position after any depression. When the keys 12 are depressed they are held against return movement by the multiple-toothed dogs 188 which are kept pressed against the keys by springs 189. Where a single-toothed pawl only is provided, it is necessary to depress the key 12 the full width of a socket before the key is locked, and when the operator is in a hurry this is not always done, with the result that the adding-wheels are advanced unduly and the number added and the number registered do not agree. By this improved construction, however, the keys 12 are retained no matter how far they are depressed, and, if the operator has not given the full stroke necessary, it will be evidenced by the fact that the sockets 17 will be out of alinement. In lieu of multiple-toothed dogs 188, a rack-bar 192 may be secured to the inner side of each key 12, and a single-toothed pawl 191 provided for each rack-bar, the teeth of the rack being set closely enough together to catch the key 12 even if it is not given the full stroke intended and prevent its premature return. A multiple-toothed pawl 44 engages each ratchet 42 and keeps the adding-wheels from turning back. The pawls 188 and 191, whichever form of key-locking means be used, are loosely supported upon a shaft 193, which extends from side to side of the machine. Upon said shaft bosses 194 are fixed, from each of which bosses a pin 195 projects. Each pawl 188 and 191 carries a pin 196, which pin is disposed substantially at right angles to the axis of the shaft 193. To one end of the shaft 193, outside the casing, knob 197 is fastened. Hence, by turning the knob clockwise, the shaft 193 is caused to revolve, the pins 195 bear upon the pins 196, so that the pawls are carried a short distance in unison with the shaft, and thus forced out of engagement with the rack-bar 192, or out of the sockets 17, as the case may be, and, in this manner, the keys 12 are permitted to return to starting position, being so returned by the springs 24.

The operation of the device may be briefly summarized as follows: The adding-wheels are rotated or partly so, by the act of the operator in depressing the key or keys which register the items to be added, the extent of rotation of each wheel being governed by the distance the key controlling same is depressed. Each such partial rotation causes the adding-wheel to add the digit registered by the key, suitable mechanism being provided to transfer the numbers accumulated on wheels of the lower orders to the wheels of the higher orders. After each item has been registered, the item is printed by the act of the operator in depressing the key 183 which rocks the platen 103 and causes same to strike the type 34 on the sectors 8. The sum of the items is printed when all the items have been added, by depressing the key 184 which rocks the platen into engagement with the adding-wheels 43. When this has been done the machine is cleared, by any suitable mechanism, after which the machine is ready for another operation.

Having thus described my said invention, what I claim and desire to secure by Letters-Patent is:

1. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which when moved in one direction engages said listing mechanism, and when in another direction engages said accumulating mechanism, and a lever which extends lengthwise of the machine for moving said platen.

2. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accumulating means, a rocking frame in which said platen is carried, and a lever which extends lengthwise of the machine for rocking said frame.

3. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accumulating means, a rocking frame in which said platen is carried, a lever to move said frame, and means at each end of said lever for moving same.

4. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accumulating means, a rocking frame in which said platen is carried, and an outwardly-projecting key at each end of said lever for moving same.

5. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accumulating means, a rocking frame in which said platen is carried, a shaft carrying said rocking frame, and a lever extending lengthwise of the machine for rocking said shaft.

6. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accu-

mulating means, a key adjacent one end of the machine to cause said platen to engage said listing means, and a key at the other end to cause same to engage said accumulating means.

7. A calculating-machine having a plurality of sectors, a socketed finger-piece secured to each sector, and a multiple-toothed pawl adapted to seat in said sockets, thereby to lock the sector in position.

8. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the totals of said items, a platen which engages said listing means and said accumulating means, a pair of rocker-arms in which said platen is journaled, a shaft passing through both of said rocker-arms and supported by the sides of the machine, and means for rocking said shaft, thereby to move the platen.

9. In a calculating-machine, the combination of mechanism for listing and printing the items, mechanism for accumulating and printing the totals of said items, a platen which engages said listing means and said accumulating means, a pair of rocker-arms in which said platen is journaled, a shaft passing through both of said rocker arms and supported by the sides of the machine, the ends of said shaft being shouldered.

10. A calculating-machine having a plurality of movable sectors, a finger-piece secured to each sector, and means to lock each sector against return movement before said sector has completed the full stroke required to register any number.

11. In a calculating-machine, the combination of a mechanism for listing and printing the items, mechanism for accumulating and printing the total thereof, a platen which is brought into engagement at different times with said listing means and with said accumulating means, a lever which extends lengthwise of the machine for moving said platen, and an outwardly-projecting key at each end of said lever for moving same.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT J. MEIER.

Witnesses:
GLADYS WALTON,
EDNA J. GOCKEL.