

J. Groesbeck.

Adding Mach.

N^o 100,288.

Patented Mar. 1, 1870.

Fig. 1.

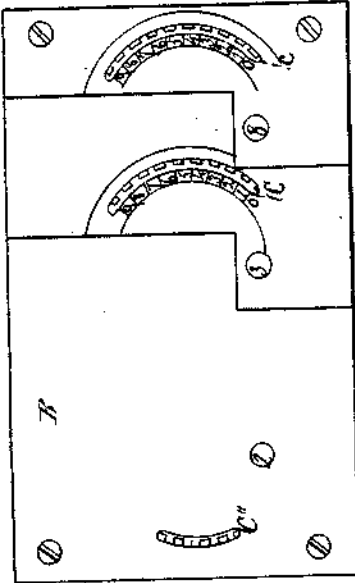


Fig. 3.



Fig. 2.

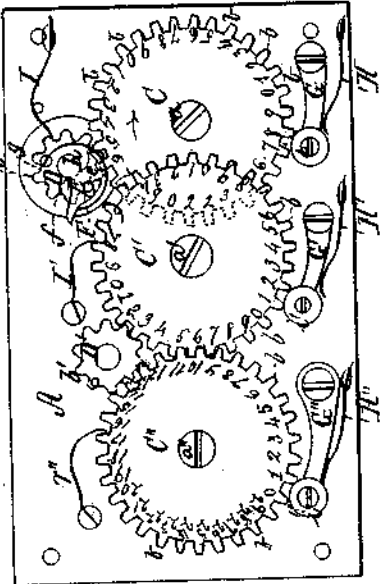
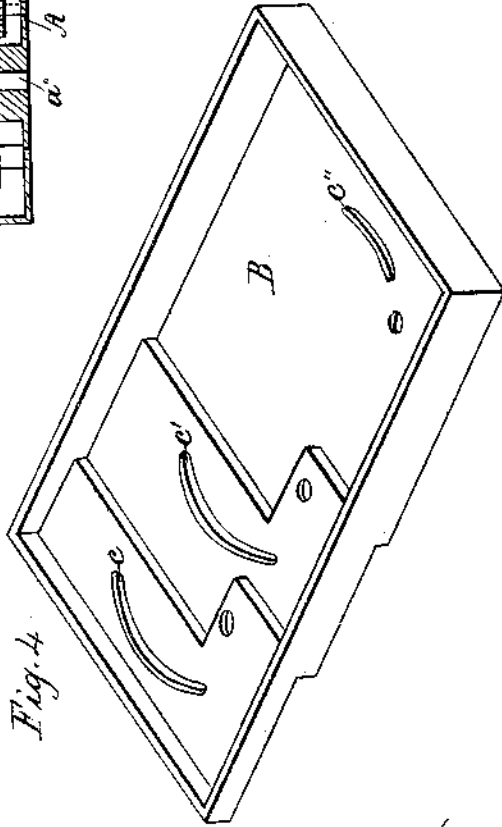


Fig. 4.



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Letters Patent No. 100,288, dated March 1, 1870.

IMPROVEMENT IN ADDING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JOHN GROESBECK, of the city of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Adding-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to combining two or more wheels, having a series of numbers arranged in a suitable case, which is provided with a cap-plate that has segmental openings, partly covering the numbers on the wheels, to bring them in view of the operator, and there being indexes of ten digits at one edge of the openings, arranged to correspond with the numbers on the wheels, to be used in conjunction therewith; and consists of a peculiarly-formed tappet, in combination with a multiplier wheel, the tappet being held in place by a segmental curve on one edge, near its center of motion, coming in contact with a segmental projection of the center-pin, on which said wheel turns, and held thereto by means of a spring, when the tappet is to bear against a tooth of an advanced wheel of the series, to carry said wheel around the distance of one tooth.

After this action of the tappet, the segmental curve above mentioned passes off the segmental projection of the center-pin, and the tappet is forced away from the numbered wheel just acted upon by the force of the spring, so as to prevent its catching on the forward tooth, or the one in advance of the multiplier-wheel.

In the accompanying drawings, which make a part of this specification—

Figure 1 is a top view of the improved machine.

Figure 2 is a like view, the cap-plate B being removed from the bed-plate A.

Figure 3 is a longitudinal section, through the line *a b* of fig. 1.

Figure 4 is an isometrical view of the cap-plate B, in a reversed position.

Like letters in all the figures indicate the same parts.

A is the bed-plate, to which the several parts of the machine are attached.

B is the cap-plate, which is shown in detail in fig. 4. I have represented in the drawings a series of wheels, C C' C'', which turn freely on the center-pins *a a' a''*.

The wheels C and C' have three series of the ten digits concentrically arranged, as seen in fig. 2, and the wheel C'' a series of numbers, commencing with a cypher, and running up to 29.

It may be seen, however, that by increasing the size of the wheels the height of the numbers may be increased in proportion.

The numbers of all the wheels correspond with the numbers of teeth or cogs *b* which connect the wheels together.

The cap-plate B has segmental slots *c c' c''* directly over the wheels C C' C'' beneath them to bring the numbers on the wheels in view of the operator.

At one edge of the slots *c c'* the ten digits are arranged in the same order as on the wheels C C' as indexes to the numbers on the wheels.

There are openings *d d d'* in the cap-plate B, over the wheels C C' C'', beneath which the sums of the numbers on the latter are brought, as hereinafter described.

D is a multiplier-wheel, having ten teeth, which gear into the teeth of the wheel C, and which carries a tappet, E, which, in every revolution of the wheel D, is brought into contact with one of the teeth *b* of the wheel C', to carry the latter around the distance of one tooth.

The tappet has a partial turn on the pin *e* which projects from the side of the wheel D, and before it reaches one of the teeth of the wheel C' the segmental curve *f*, on its rear edge, gently comes into connection with the segmental projection *g* of the pin *h*, on which the wheel D revolves, and is thus brought into the right position to act on the wheel C.

f is a spring, whose resilient part bears against the forward edge of the tappet E, and keeps the segmental curve *f* against the segmental projection *g*, around which it slides, until the tappet passes the tooth, with which it engages, of the wheel C', and then bears the tappet away from the said wheel to prevent it striking the next tooth, the curve *f* being by this time disengaged from the projection *g*, and thus allowing the tappet to have a partial turn on its center pin *e*.

There is a multiplier-wheel, D', having ten teeth, which gear into the teeth of the wheel C'.

Projecting upward from the side of the said wheel D' is a pin, *h'*, which in every revolution of the wheels is brought to bear against one of the teeth of the wheel C'', to carry said wheel around the distance of one tooth.

There are pawls G G' G'' which carry friction-roller *i i i'*, which bear between contiguous teeth of the wheels C C' C'', to hold the latter accurately in position when stopped, the pawls being actuated by the springs H H' H'' respectively.

Auxiliary to said pawls are the spring-detents I I' I'', which catch respectively against the front edges of the teeth of the wheels C C' C'', to prevent the latter being carried around with too much force by their momentum, while the pawls G G' G'' give accuracy to their stoppages.

The spring-detent I, instead of bearing against the

teeth of the wheel C, as the others against their wheels, bears against the teeth of the wheel D, as represented, and operates on both wheels.

The detents I I' I" are so placed that when the wheels C C' C" are at rest their teeth shall not touch the teeth of the multiplier-wheels D D', and so operate as to prevent the wheels i i' i" of the pawls G G' G" stopping on the ends of the teeth of wheels, instead of between the teeth. They also prevent the movement of the wheels C C' C" by mere momentum, which could not be effected by the springs H H' H", unless they were made so strong as to prevent an easy movement of said wheels.

The operation is as follows:

The wheels C C' C" are set by means of a pointer, so that 0 appears at each of the openings d. This is done by the pointer being placed respectively in the concentric slots e e' e" of the cap-plate B. By bearing against a tooth the wheel is moved around the requisite distance. Then the wheel is moved from the number to be added to the bottom of the index. For instance, to add 35 and 63: after setting the wheel at 0, insert the pointer at 3 in the segmental slot corresponding to the column to be added, and carry down until stopped at the bottom of the index, then at 5 at the

first index in the same manner, when 3 will appear at the second slot, and 5 at the first. Then repeat the operation in the same manner, when 3 will appear at the second slot, and 5 at the first. Then repeat the operation in the same manner with 63, when the sum 98 will appear.

In the drawings, but two wheels having indexes are given; but the same principle may be applied in the use of a greater number of wheels, until 3, 4, or more columns may be added at a time.

What I claim as my invention, and desire to secure by Letters Patent, is—

The tappet E, when constructed with the segmental curve f, and combined with the multiplier-wheel D, spring F, and segmental projection g of the center-pin h, and arranged to operate in relation to the wheel C, substantially as specified.

In testimony that the above is my invention, I have hereunto set my hand and affixed my seal this 14th day of May, 1869.

JOHN GROESBECK. [L. S.]

Witnesses:

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