

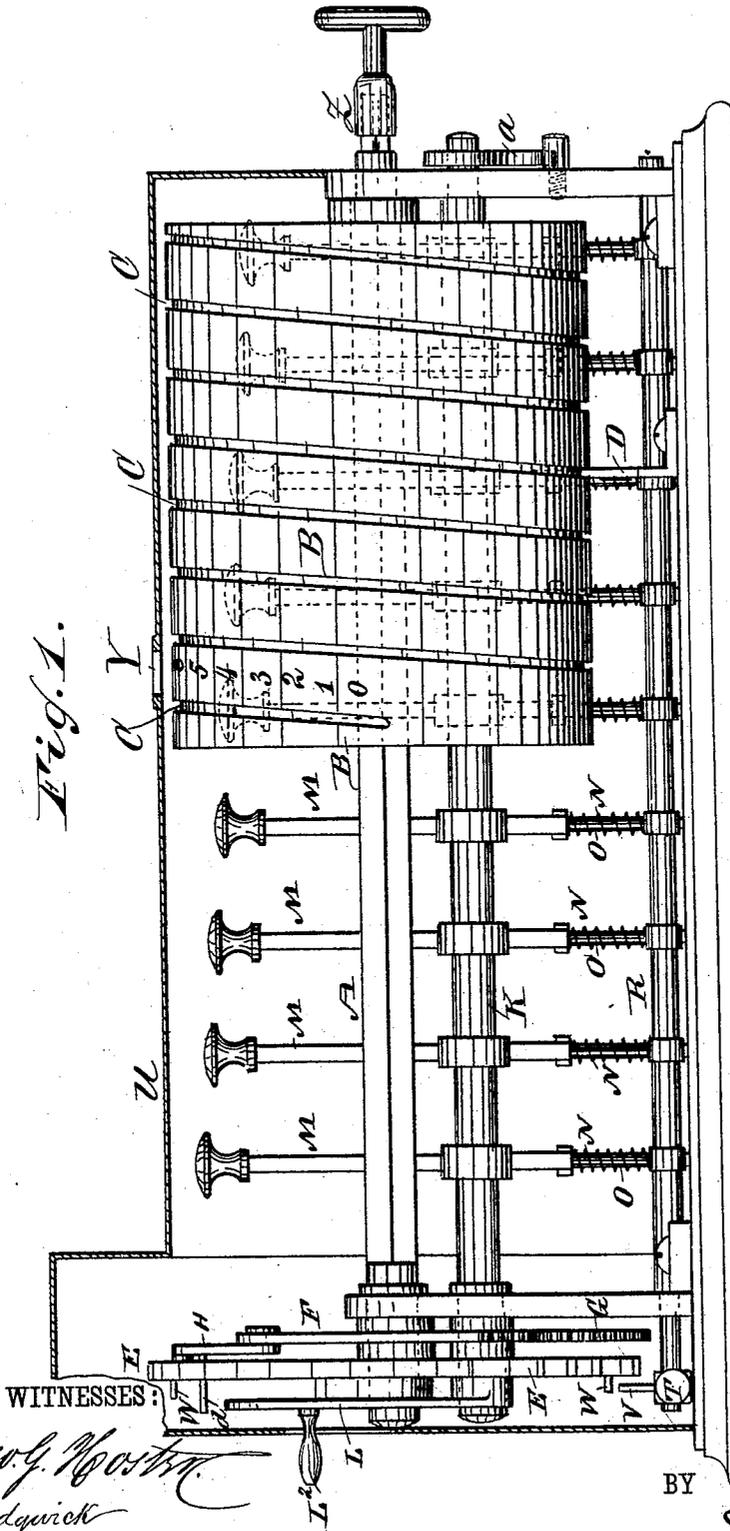
A. STETTNER, Jr.

ADDING MACHINE.

No. 277,627.

Patented May 15, 1883.

Fig. 1.



WITNESSES:
Thos. G. Boston
Le. Sedgwick

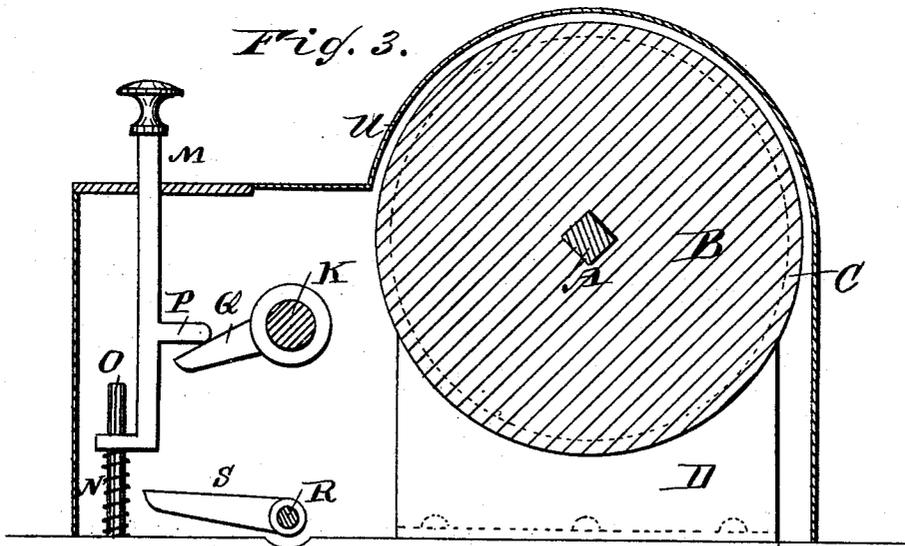
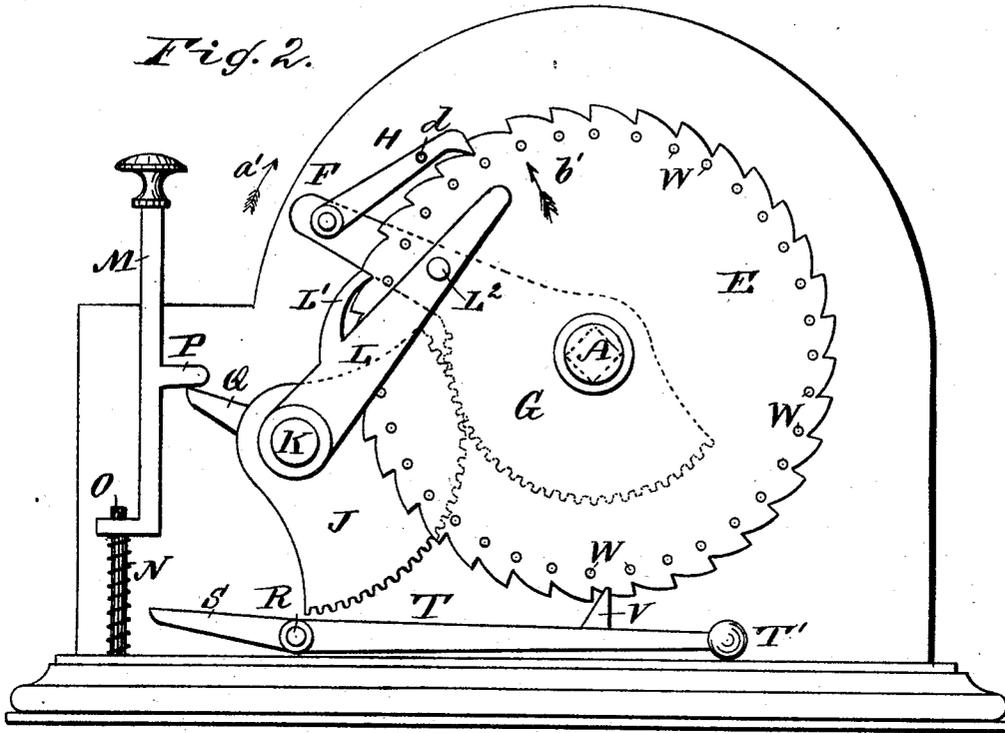
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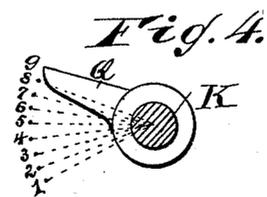
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UNITED STATES PATENT OFFICE.

ALBERT STETTNER, JR., OF BERLIN, GERMANY.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 277,627, dated May 15, 1883.

Application filed March 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT STETTNER, JR., of Berlin, Germany, have invented a new and improved Adding-Machine, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved machine for adding numbers rapidly.

The invention consists in an adding-machine constructed with a spirally-grooved cylinder carrying the numbers from 1 to 1,000, which cylinder is revolved more or less, according as the series of key-rods are depressed, which key-rods are provided with tappets acting on projections on a shaft provided at the end with a segmental rack, engaging with another segmental rack made integral with an arm loosely mounted on the shaft, and provided with a pawl engaging with the teeth of a ratchet-wheel rigidly mounted on the end of the shaft.

The invention further consists in a shaft provided with projections extending below the key-rods, and at the end with an arm having a tooth which passes in between studs on the ratchet-wheel, for the purpose of preventing the ratchet-wheel from being rotated too far.

The invention also consists in various parts and details, and combinations of the same, as will be fully set forth and described hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal elevation of my improved adding-machine, the casing being shown in section. Fig. 2 is an end elevation of the same, the casing being removed. Fig. 3 is a cross-sectional elevation of the same. Fig. 4 is a cross-sectional elevation of the shaft, showing the various positions of the arms of the same.

A shaft, A, is journaled horizontally in a suitable frame, and is either squared between the ends or provided with longitudinal ribs, so that the cylinder B, mounted on the said shaft, will turn with the same, but can slide longitudinally on the said shaft. The cylinder B is provided with a spiral groove, C, and on the ridges between the grooves the numbers from 1 to 1,000 are produced, the numbers beginning at one end of the cylinder and running

spirally around the same. A blade, D, attached to the base of the machine, passes into the spiral groove C, so that when the shaft A rotates the cylinder B the action of the blade D in the spiral groove C causes a movement of the cylinder C in one direction or the other, according to the direction in which the shaft is turned.

On one end of the shaft A a ratchet-wheel, E, is rigidly mounted, and adjoining the said ratchet-wheel an arm, F, is loosely mounted on the cylindrical part of the shaft A, with which arm F a segmental rack, G, is made integral. A pawl, H, pivoted to the outer end of the arm F, engages with the teeth of the wheel E. A segmental rack, J, is mounted rigidly on the end of a shaft, K, parallel with, in front of, and slightly below the shaft A.

On the end of the shaft K an arm, L, is mounted, which is provided with a pawl, L', adapted to engage with the teeth of the wheel E, which arm L is also provided with a handle, L². Nine key-rods, M, are held in a row and to move vertically in the front part of the frame of the machine, and are pressed upward by springs N, surrounding rods O, which pass through the lower rectangular bent ends of the said key-rods. The key-rods are provided with the numbers from 1 to 9. Each key-rod M is provided with a tappet, P, adapted to engage with a corresponding projection, Q, on the shaft K.

Below the shaft K, and parallel therewith, a shaft, R, is journaled, which is provided with as many arms as there are key-rods M, which arms S extend under the lower ends of the key-rods. At the end the shaft R is provided with a long arm, T, provided with a weight, T', at the upper end, and with an upwardly-projecting tooth, V, which is adapted to pass between studs W, projecting from the outer surface of the wheel E, which studs are arranged in a circle along the edge of the said wheel. The casing U, surrounding the machine, is provided in its top with an opening, Y, through which the numbers on the cylinder B can be seen. One end of the shaft A is squared and adapted to receive a key, Z. A spring, a, acting on the shaft K, always turns the same back into its original position—that is to say, if the projections Q of the shaft K

have been swung downward, the spring *a* turns the shaft *K* in such a manner that the projections will swing upward again. The length of the projections *Q* and their inclinations to the shaft *K* are arranged as shown in Fig. 4—that is, they have nine different positions—and are so arranged as to describe different arcs, according to the numbers they represent—that is to say, the arm or projection *Q* that is depressed by the key-rod *1* describes a very small arc, and the projection *Q* that is depressed by the key-rod *9* describes an arc which is nine times longer, and so on.

The operation is as follows: The cylinder *B* is so adjusted that the zero will show in the opening *Y*. Then the operator begins to add by depressing the keys corresponding to the numbers that he wishes to add, and after he has added the numbers he reads off the result by looking into the opening *Y*. If one of the key-rods *M* is depressed, its projection or tappet *P* strikes the corresponding projection, *Q*, of the shaft *K* and turns the said shaft and the segmental rack *J*. As the said segmental rack engages with the segmental rack *G* the arm *F* will be swung in the direction of the arrow *a'*, and the pawl *H*, engaging with the teeth of the wheel *E*, swings the said wheel in the same direction. The wheel is moved in the direction of the arrow *a'* a greater or less distance, according as the shaft *K* has been revolved a greater or less distance, and this distance again depends on the key-rod that has been depressed, for, as has been stated above, the key-rods representing the higher numbers are depressed a greater distance than those representing the lower numbers. That the cylinder shall not be rotated too far in case the key-rods are depressed too suddenly, I have provided the check-lever *T*, so that the key-rods *M* can strike the corresponding projections, *S*, on the shaft *R*, and thus throw the inner end of the arm *T* upward, causing the tooth *V* to pass upward and in between the studs *W*, thereby arresting wheel *E*. After the numbers have been added, the cylinder *B* must be turned backward again, so that its zero will be under the opening *Y*, and to permit this the pawl *H* must be disengaged from the teeth of the wheel *E*. This is accomplished by swinging the arm *L* in the direction of the arrow *b'*, whereby it strikes against the stud *d* on the pawl *H* and disengages the same, and then the shaft *A* can be turned in the inverse direction by means of the key *Z*. The pawl *L'* checks the wheel *E* and prevents it from being rotated backward when the racks *G* *J* swing downward.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an adding-machine, the combination, with a spirally-grooved cylinder adapted to

move longitudinally on its shaft, of a ratchet-wheel mounted rigidly on the end of the shaft, a blade working in the groove of the cylinder, an arm mounted loosely on the end of the shaft, and provided with a pawl for engaging with the ratchet-wheel and with a segmental rack, a second segmental rack engaging with the above-mentioned segmental rack, and mounted on the end of a shaft provided with a series of segmental projections, and of nine key-rods provided with tappets for striking against the projections of the last above-mentioned shaft, and thereby swinging the segmental racks and the arm with a pawl and turning the grooved cylinder, substantially as herein shown and described, and for the purpose set forth.

2. In an adding-machine, the combination, with the grooved cylinder *B*, mounted on the shaft *A*, and the blade *D*, of the ratchet-wheel *E*, the arm *F*, provided with the pawl *H* and the segmental rack *G*, the rack *J*, engaging with the rack *G*, the shaft *K*, provided with the projections *Q*, the key-rods *M*, provided with the tappets *P*, the guide-rods *O*, and the springs *N*, substantially as herein shown and described, and for the purpose set forth.

3. In an adding-machine, the combination, with the grooved cylinder *B*, mounted on the shaft *A*, and the blade *D*, of the ratchet-wheel *E*, the arm *F*, provided with a pawl, *H*, and a segmental rack, *G*, the rack *J*, engaging with the rack *G*, the shaft *K*, provided with the projections *Q*, the key-rods *M*, provided with the tappets *P*, and the arm *L*, provided with the pawl *L'*, substantially as herein shown and described, and for the purpose set forth.

4. In an adding-machine, the combination, with the grooved cylinder *B*, mounted on the shaft *A*, and the blade *D*, of the ratchet-wheel *E*, the arm *F*, provided with the pawl *H*, the stud *d*, the segmental racks *G* and *J*, the shaft *K*, provided with projections *Q*, the key-rods *M*, provided with the tappets *P*, the arm *L*, provided with the pawl *L'*, and the handle *L''*, substantially as herein shown and described, and for the purposes set forth.

5. In an adding-machine, the combination, with the spirally-grooved cylinder *B*, mounted on the shaft *A*, and the blade *D*, of the ratchet-wheel *E*, the arm *F*, provided with the pawl *H*, the segmental racks *G* and *J*, the shaft *K*, provided with projections *Q*, the key-rods *M*, provided with tappets *P*, the shaft *R*, provided with projections *S*, the arm *T*, the tooth *V*, and the studs *W*, projecting from the wheel *E*, substantially as herein shown and described, and for the purpose set forth.

Signed at the city of Berlin, Prussia, this 5th January, A. D. 1883.

ALB. STETTNER, JR.

Witnesses:

B. ROI,

GEORG HABERKORN.