

(No Model.)

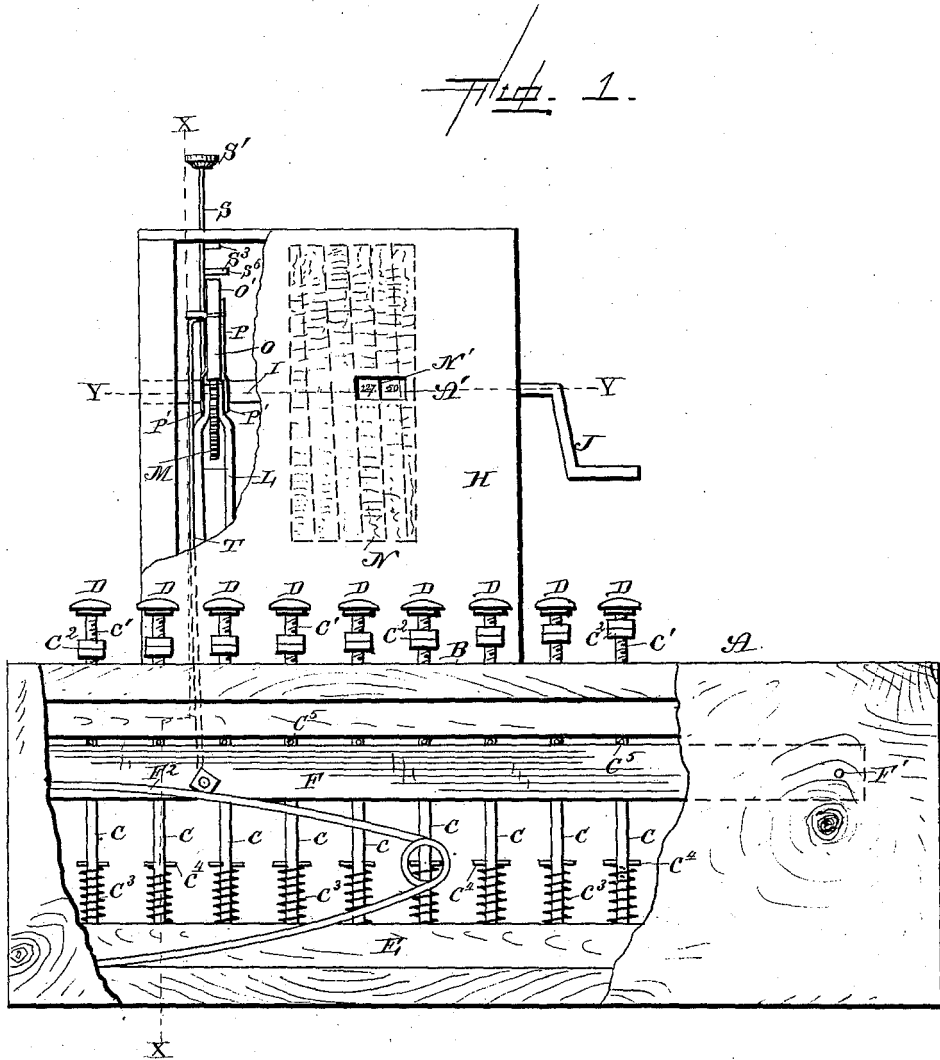
2 Sheets—Sheet 1.

W. C. SMALSTIG.

ADDING MACHINE.

No. 300,809.

Patented June 24, 1884.



— Witnesses. —

Louis F. Gardner
J. W. Garner

— Inventor. —

W. C. Smalstig,
per
J. A. Schmann,
att'y.

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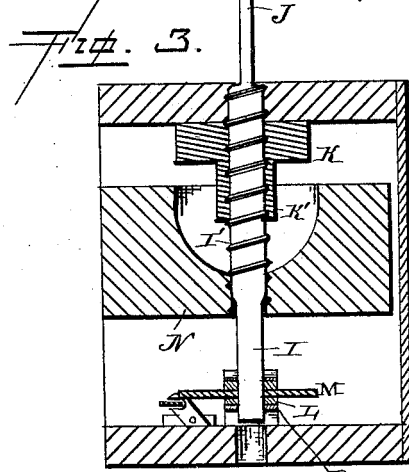
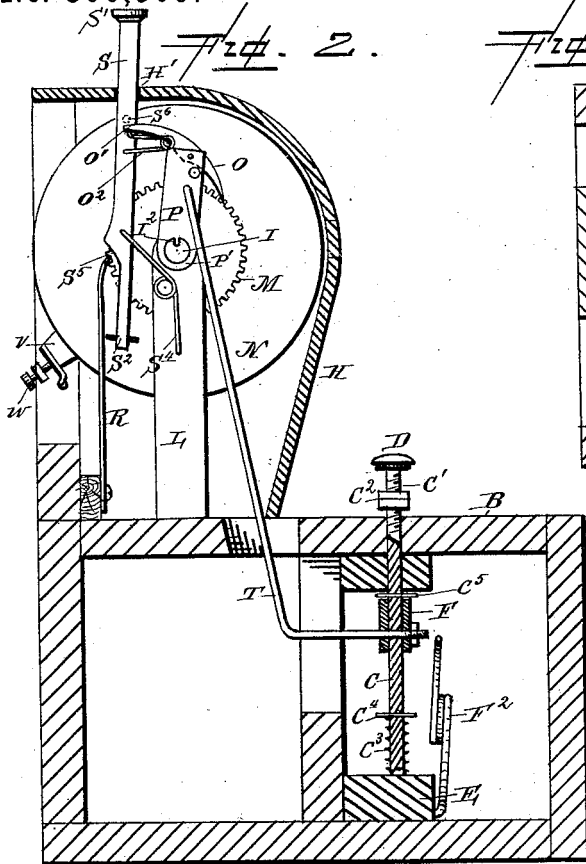
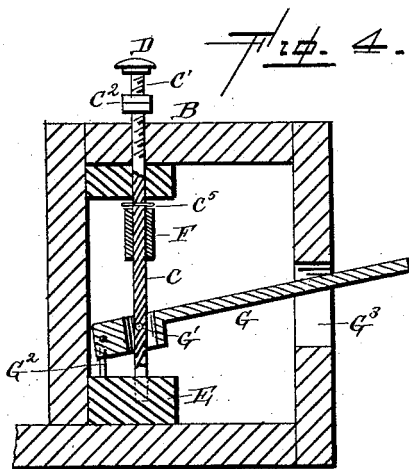


Fig. 5.

251	111	111	111
269	122	122	122
287	133	133	133
305	144	144	144
323	155	155	155
341	166	166	166
359	177	177	177
377	188	188	188
395	199	199	199
413	210	210	210
431	221	221	221
449	232	232	232
467	243	243	243
485	254	254	254
503	265	265	265
521	276	276	276
539	287	287	287
557	298	298	298
575	309	309	309
593	320	320	320
611	331	331	331
629	342	342	342
647	353	353	353
665	364	364	364
683	375	375	375
701	386	386	386
719	397	397	397
737	408	408	408
755	419	419	419
773	430	430	430
791	441	441	441
809	452	452	452
827	463	463	463
845	474	474	474
863	485	485	485
881	496	496	496
899	507	507	507
917	518	518	518
935	529	529	529
953	540	540	540
971	551	551	551
989	562	562	562
1007	573	573	573
1025	584	584	584
1043	595	595	595
1061	606	606	606
1079	617	617	617
1097	628	628	628
1115	639	639	639
1133	650	650	650
1151	661	661	661
1169	672	672	672
1187	683	683	683
1205	694	694	694
1223	705	705	705
1241	716	716	716
1259	727	727	727
1277	738	738	738
1295	749	749	749
1313	760	760	760
1331	771	771	771
1349	782	782	782
1367	793	793	793
1385	804	804	804
1403	815	815	815
1421	826	826	826
1439	837	837	837
1457	848	848	848
1475	859	859	859
1493	870	870	870
1511	881	881	881
1529	892	892	892
1547	903	903	903
1565	914	914	914
1583	925	925	925
1601	936	936	936
1619	947	947	947
1637	958	958	958
1655	969	969	969
1673	980	980	980
1691	991	991	991
1709	1002	1002	1002



— Witnesses. —
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— Inventor. —
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 J. A. Lehmann, atty

UNITED STATES PATENT OFFICE.

WILLIAM C. SMALSTIG, OF SPRINGFIELD, MISSOURI.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 300,809, dated June 24, 1884.

Application filed October 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. SMALSTIG, of Springfield, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Adding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in adding-machines; and it consists, first, in an adding-machine, in the combination of an endwise-moving registering-cylinder having the numbers spirally and consecutively arranged thereon, an endwise-moving shaft, and a suitable mechanism for rotating and moving the shaft endwise; second, in the combination of an endwise-moving registering-cylinder having the numbers spirally and consecutively arranged thereon, an endwise-moving shaft having a spiral groove, and a suitable mechanism for rotating and moving the shaft endwise; third, in the combination of the cylinder having the numbers spirally arranged thereon, an endwise-moving shaft to which the cylinder is secured, and which is provided with a thread or groove, and bearings for the shaft, with a spur-wheel which is feathered upon the shaft, a pawl, and a suitable operating mechanism; fourth, in the combination of the cylinder having the numbers arranged spirally thereon, the shaft provided with a groove or thread, a nut which forms one of the bearings for the shaft, a spur-wheel which is feathered upon the shaft, a frame which is pivoted on said shaft, a pawl, a detent, and suitable operating mechanism; fifth, in the combination and arrangement of parts, which will be more fully described hereinafter.

The object of my invention is to produce an adding-machine that is simple in construction, is positive and accurate in its operation, and can be manufactured and sold at a much lower cost than any similar machine now upon the market.

In the accompanying drawings, Figure 1 is a front elevation of an adding-machine embodying my invention, portions of the casing being removed so as to disclose the operating mechanism. Fig. 2 is a vertical cross-sectional

view taken on the line X X of Fig. 1. Fig. 3 is a detailed longitudinal sectional view of the cylinder and the operating-shaft and its bearings on the line Y Y of Fig. 1. Fig. 4 is a detailed view of one of the operating-keys. Fig. 5 is a detached view of the cylinder alone.

A represents an inclosing-case, of any suitable construction, in which the operating mechanism is located. This case is provided with an aperture, A'.

B represents the key-board, from the face of which project the operating-rods C, which have the buttons D on their upper ends, and have their lower ends socketed in a bar, E, that extends along the bottom of the case below the key-board, thus holding the rods in an upright position and allowing them a vertical movement. These operating-rods are preferably nine in number, representing figures from 1 to 9, figure 1 being on the left hand of the key-board, and the others extending therefrom to the right in numerical order. Each of these rods has its upper end screw-threaded, as at C', above the key-board, and has the clamping-nuts C'' applied thereon, the function of these nuts being to so adjust the rod in relation to the key-board that the rod will, upon being depressed, cause the adding-cylinder to rotate a distance commensurate with the number that the rod may represent. Thus, should the number 4 on the cylinder appear through the opening in the case and the rod 3 be depressed, the nuts on the said rod 3 should be so adjusted as to cause the cylinder to rotate through three spaces, and thus cause the number 7 to appear through the opening, and so on for each of the other rods. The lower ends of these rods have the coiled extensile springs C''' around them, which springs bear between the upper side of the bar E and the transverse pin C'', with which each of the operating-rods is provided. The function of these springs is to keep the operating-rods normally at the upper limit of their movement.

F represents an operating-lever, which extends along the case beneath the key-board, is pivoted in said case at its right extremity, as at F', and is provided with the spring F'' at its left extremity, the function of this spring being to keep the lever normally in the hori-

zontal position shown in Fig. 1 in solid lines. Extending through the rods C are the transverse pins C⁵, which bear upon the upper edge of the lever F, and thereby depress said lever when one of the rods C is depressed.

In Fig. 4 I illustrate a key-lever, which may be applied to each of the operating-rods should greater leverage be desirable, in order to lessen the labor of operating the machine. This lever G is fulcrumed to the rod at G', is confined at its inner end by the link G², and has its outer free end extending through an opening, G³, made in the outer face of the case. In the upper portion, H, of the case is secured the operating-shaft I. This shaft I has one of its ends provided with a large open screw-thread, I', which extends along the shaft a suitable distance. The smooth end of the shaft is provided with a groove, I². The threaded end of the shaft is screwed through a nut, K, secured in the case, which nut is provided with an inner extension, K', long enough to form a solid bearing for the shaft. The smooth end of the shaft passes through bearings L, secured to the opposite side of the case, and in between these bearings and upon the shaft I is placed a spur or ratchet wheel, M, provided with a feather, which fits into the groove I² of the shaft, and thus causes the wheel M to rotate with the shaft, and at the same time allow the shaft an independent endwise movement in its bearings. To one end of the shaft is attached a crank, J.

Rigidly secured to the shaft I is a cylinder or drum, N, which may be of any desired length. Upon the face of this cylinder are inscribed numbers from 1 up to as large a number as may be desired. These numbers are arranged spirally upon the cylinder, number 1 being at the right thereof, and there are as many numbers placed upon one spiral on the cylinder as there are ratchets or teeth upon the wheel M. Thus, if there be seventy-seven ratchets upon said wheel, the numbers from 1 to 77, inclusive, will make one spiral on the face of the cylinder. Further, the spiral threads I' upon the shaft I must have as wide a space between them as there is between the dividing spiral lines N' on the cylinder.

O represents a pawl having a rearward extension, O'. This pawl is pivoted in a frame, P, which has its lower bifurcated ends, P', pivoted upon the shaft I on both sides of the bearings L. The pawl O engages with the ratchet-wheel M, and is provided with a spring, O², for making its action positive.

R represents a detent-spring, which is secured in the rear side of the case at its lower end, and has its upper free end engaging with the rear side of the ratchet-wheel M. This spring is considerably broader than the wheel M, and projects a suitable distance to the left of said wheel.

S represents a flat rod which projects above the top of the case through a slit, H', formed therein, has a button, S', secured to its upper end, and has its lower end passed through a

slitted bearing-plate, S², screwed to the inner side of the case. This rod is further provided with a stop, S³, for limiting its upward movement, a spring, S', for keeping it normally in that position, as shown at Fig. 2, and incline S⁵, bearing against the projecting upper side of the detent-spring R, and a tappet-pin, S⁶. When the rod is depressed, the pin S⁶ strikes against the upper side of the rearward extension of the pawl O, throwing said pawl out of connection with the ratchet-wheel M, and the incline S⁵ presses the detent-spring R backward out of contact with the wheel M at the same time.

T represents a connecting-rod, the upper end of which is pivoted in the pivoted frame P, while its lower end is secured in the operating-lever F. When the lever F is depressed by one of the keys, the movement of the lever F is communicated to the cylinder N through the rod T, frame P, pawl O, ratchet-wheel M, and shaft I, and the cylinder moves through as many spaces as the number that the key represents. When the wheel M is released, as above stated, the crank J can be turned backward, so as to move the cylinder to the left until the cipher thereon is visible through the aperture A'. The machine is then ready for use in adding figures. In order to prevent any possible inaccuracy in the operation of my machine by reason of the momentum of the registering-cylinder, I provide a brake-shoe, V, which is made of some soft substance, preferably india-rubber, and which is caused to bear upon the cylinder at any suitable point. A set-screw, W, enables the brake-shoe to bear against the cylinder with any requisite force.

The operation will be very readily understood from the foregoing description and by reference to the drawings hereto attached.

I do not desire to limit myself to the precise construction and arrangement of parts hereinbefore described, as it is obvious that many modifications may be made therein without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. In an adding-machine, a registering-cylinder mounted on an endwise-moving shaft, and having the numbers spirally and consecutively arranged upon it, in combination with suitable mechanism for rotating and moving the shaft lengthwise, substantially as specified.

2. In an adding-machine, the combination of the cylinder N, having the numbers spirally and consecutively arranged thereon, the shaft I, having the spiral thread or groove I', and suitable actuating mechanism, substantially as set forth.

3. In an adding-machine, the combination of the cylinder N, having the numbers spirally and consecutively arranged thereon, the shaft I, having the spiral thread or groove I' and crank J, and suitable actuating mechanism, substantially as described.

4. In an adding-machine, the combination

of the cylinder N, having the numbers spirally and consecutively arranged thereon, shaft I, having thread or groove I', bearings for said shaft, wheel M, feathered to said shaft, pawl O, and suitable actuating mechanism, substantially as shown and described.

5 5. In an adding-machine, the combination of the cylinder N, having the numbers spirally and consecutively arranged thereon, shaft I, 10 having a thread or groove, I', bearings for said shaft, wheel M, feathered to said shaft, pawl O, suitable actuating mechanism, and detent R, substantially as set forth.

15 6. In an adding-machine, the combination of the cylinder N, having the numbers spirally and consecutively arranged thereon, shaft I, having a thread or groove, I', nut K, forming a bearing for said shaft, wheel M, feathered to said shaft, frame P, pivoted on said shaft, pawl 20 O, pivoted in frame P, detent R, and suitable actuating mechanism, substantially as specified.

7. In an adding-machine, the combination of the cylinder N, shaft I, crank J, wheel M, 25 frame P, pawl O, detent R, tripping-rod S, and suitable operating mechanism, substantially as shown and described.

30 8. In an adding-machine, the combination of the registering-cylinder N, shaft I, crank J, wheel M, frame P, pawl O, detent R, trip-

ping-rod S, connecting-rod T, operating-lever F, spring F², and operating-keys C, substantially as set forth.

9. In an adding-machine, the combination of the registering-cylinder N, shaft I, crank J, 35 wheel M, frame P, pawl O, detent R, tripping-rod S, connecting-rod T, operating-lever F, spring F², and operating-keys C, having adjusting devices, substantially as specified.

10. In an adding-machine, the combination 40 of the registering-cylinder N, shaft I, crank J, wheel M, frame P, pawl O, detent R, tripping-rod S, connecting-rod T, operating-lever F, spring F², and operating-keys C, having adjusting devices C² and springs C³, substantially 45 as set forth.

11. In an adding-machine, the combination of the registering-cylinder N, brake V, shaft I, crank J, wheel M, frame P, pawl O, detent R, tripping-rod S, connecting-rod T, operating- 50 lever F, spring F², and operating-keys C, all combined and arranged to operate substantially in the manner described.

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

W. C. SMALSTIG.

Witnesses:

J. T. MEANS,
WM. MCADAMS.