

H. EBERHARDT.
ADDING MACHINE.

APPLICATION FILED MAR. 3, 1904.

2 SHEETS—SHEET 1.

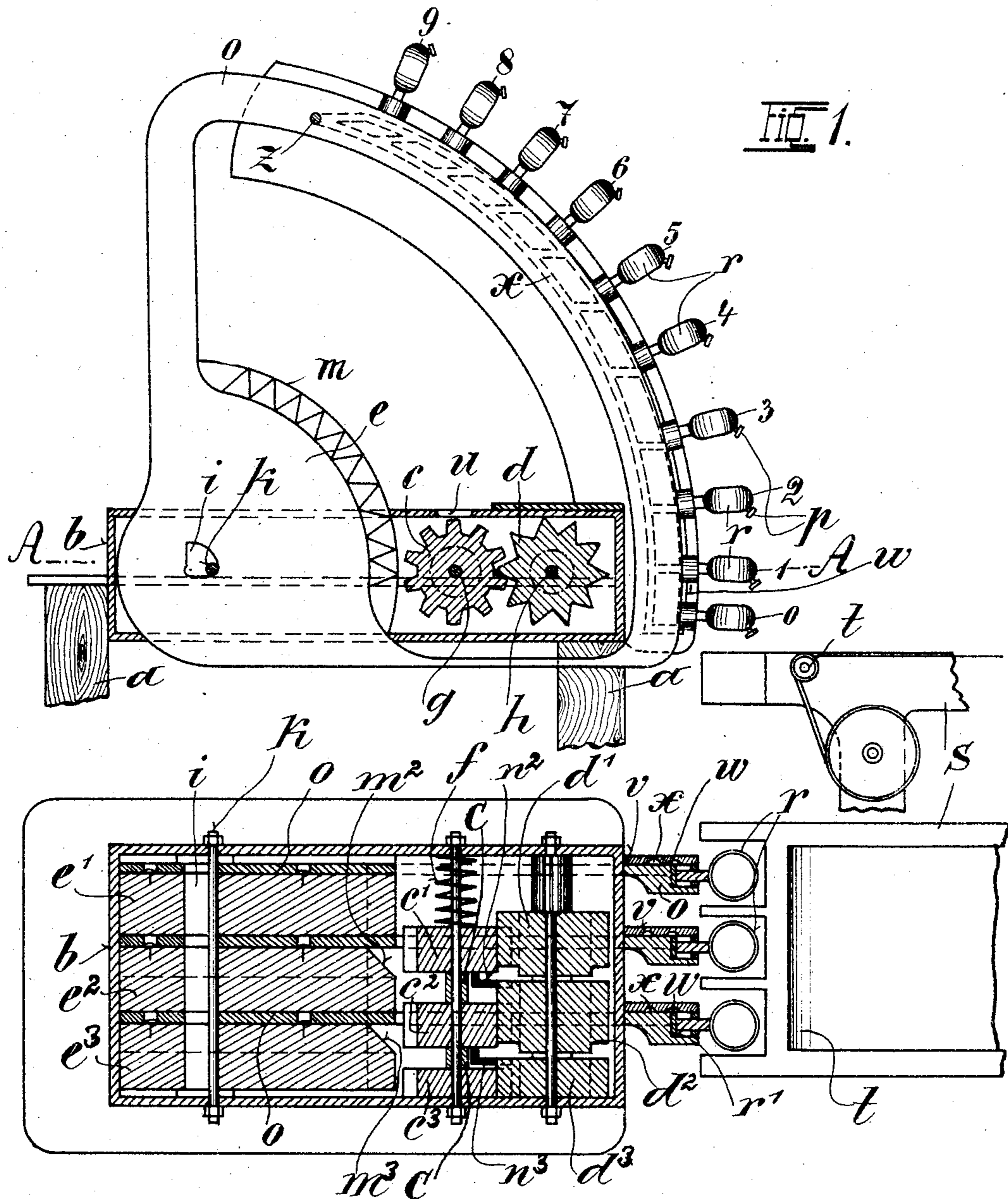


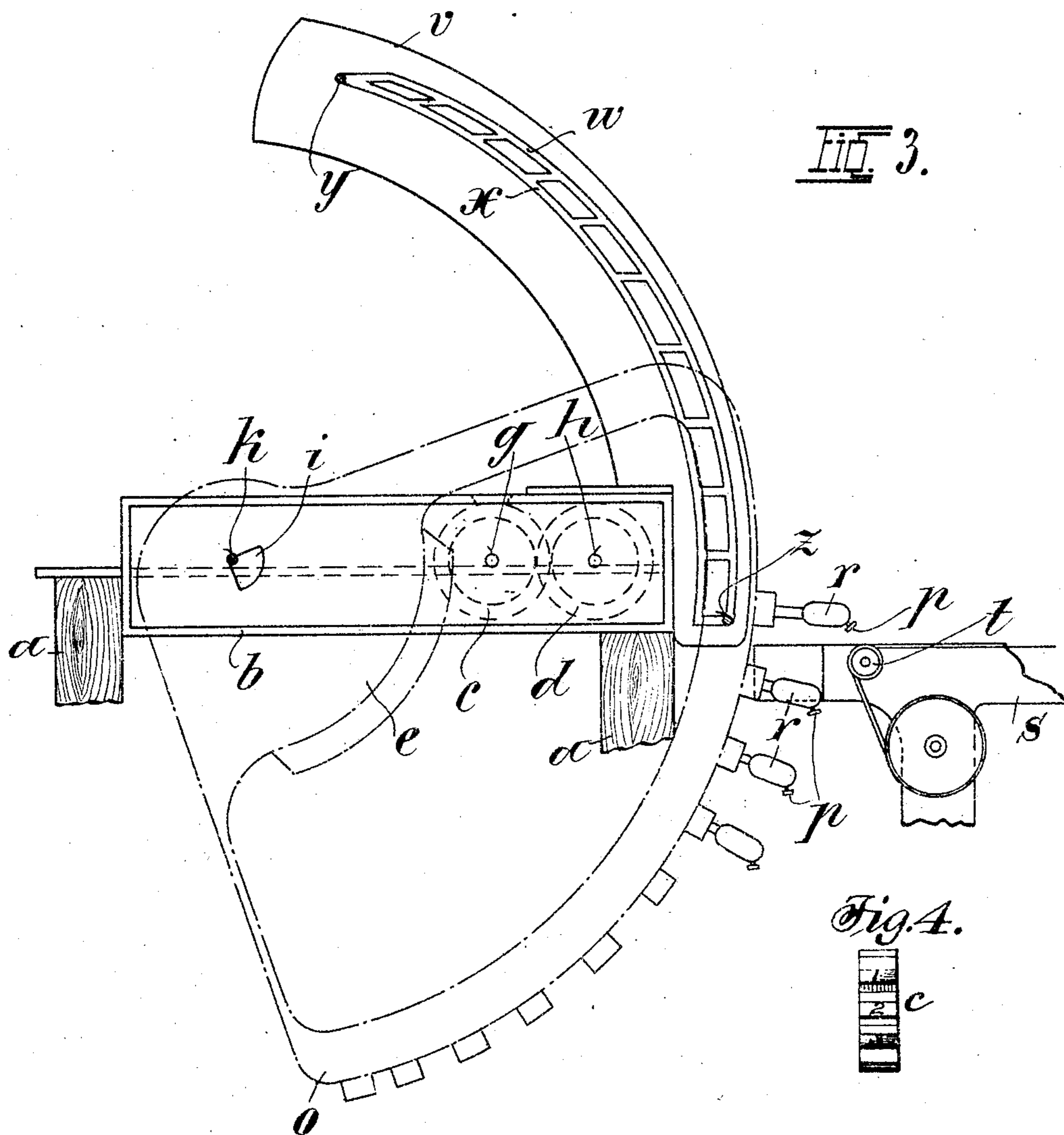
Fig. 2.

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Inventor:—
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by Paul C. Thimney
his attorney

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HERMANN EBERHARDT, OF BRESLAU, GERMANY.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 786,490, dated April 4, 1905.

Application filed March 3, 1904. Serial No. 196,284.

To all whom it may concern:

Be it known that I, HERMANN EBERHARDT, a subject of the Emperor of Germany, and a resident of Breslau, Germany, 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 apper-
 10 tains to make and use the same.

The subject of my invention is an adding-machine in which the addition is done in items instead of in columns and the separate items on addition appear printed in
 15 order on a paper strip, so that any error in the calculation can be immediately determined by comparison with the numbers presented and corrected without further addition. The individual numerals of the items
 20 can be set up for addition in the same order as they are spoken—that is to say, from left to right—whereby correctness of addition is essentially promoted.

In the accompanying drawings, Figure 1
 25 shows an interior elevation, partly in section, of the apparatus in the position of rest. Fig. 2 represents a horizontal section on the line A A of Fig. 1. Fig. 3 is a diagrammatic view of the apparatus in the position for use.

30 The apparatus is contained in a case *b*, supported on legs *a*, and comprises the counting-wheels *c'* *c*² *c*³, the carrying-wheels *d'* *d*² *d*³, and the driving-segments *e'* *e*² *e*³. Instead of there being only three of each of the said
 35 parts, as shown, any desired number of the same may be employed. The counting-wheels *c* adjoin each other and are acted upon by a spring *f*, having a tendency to press them to the left, and their teeth are pro-
 40 vided with the numerals from "0" to "9," as is usual in such machines. They are mounted with capability of sliding on the shaft *g*, while the carrying-wheels *d*, which
 45 are free to rotate on shaft *h*, but are rigidly secured against sliding thereon, and the segments *c*, having sector-shaped apertures *i*, are mounted to rotate on the shaft *k* and slide horizontally and transversely thereon. Owing
 50 to the lateral sliding motion of the counting-wheels *c*, on the one hand, and the twofold

motion of the segments, on the other hand, one or more counting-wheels may be forced out of engagement with the carrying-wheels. This is effected by means of the beveled edges *m* of the segments *e*² *e*³. If one of these seg-
 55 ments—for instance, the segment *e*²—is drawn forward out of the position of rest, Fig. 1, until the rear wall of the aperture *i* reaches the shaft *k*, the counting-wheel *c'*
 60 will be moved to the right against the action of spring *f* by the beveled edge *m*², and thus the pin *n*² is removed out of the plane of the carrying-wheel *d*², so that on turning the seg-
 65 ment *e*², the teeth of which at this same time engage in those of the wheel *c*², the wheel *c*², but not the wheel *c'*, will be set in motion. If
 70 the segment *e*² is thrown back again out of gear with the wheel *c'*, this wheel under the influence of the spring *f* will return to its position of rest. If the segment *e*³ is then moved
 75 forward in the same manner as previously was the segment *e*², it will not only force the wheel *c'* aside, but also the wheel *c*², and consequently not only the pin *n*², but also the pin
 80 *n*³, will be thrown out the plane of their engaging carrying-wheels, the wheel *c*³ alone being thus set in motion when the segment is
 85 operated. Thus when any segment is actuated all the counting-wheels to the right of it are disengaged from the carrying-wheels. From this it is clear that when each segment
 90 is operated none of the succeeding counting-wheels to the right will be actuated, while the one it engages and the carrying-wheel will be in front of it, and all of the wheels to the left
 95 will be in operative position. From this results the advantage already mentioned that the numerals of the individual items can be arranged for addition and printed in the
 100 order in which they are spoken—that is to say, from left to right.

For the adding operation the sector-shaped frames *o*, rigidly secured to the segments *e*, are employed, the front of said frames being
 thickened, and a handle *r* is provided for
 95 each frame capable of sliding outwardly from the center of motion of the segment and each furnished with numerals from "0" to
 "9" and provided below with type *p*. The
 outward movement of the handles *r* is lim-

ited by the shoulder r' , provided on each stem. If now one of those handles is seized and drawn forward, its segment will be drawn forward and will engage with the corresponding counting-wheel, and at the same time the handle also will advance outwardly, so that on the segment-frame moving downward under pressure on the handle the counting-wheels are set in motion until the projecting handle strikes the paper roll or strip t , located in a table s in front of the machine, and thus the type p of that particular handle prints upon the paper. As the longer or shorter rotation of the wheels depends upon the stroke of the frame e each time and as the position, as well as the number of the handles r , corresponds with the teeth of the wheels and as the moving wheels at each rotation on their axis advance the succeeding wheel one tooth, it is obvious that by pulling forward and depressing the various handles in succession the wheels c give the sum of the figures marked on the paper t , which numbers can be read on the teeth of the counting-wheels through the slot u , Fig. 1, provided in the casing. It is obvious that the handle carrying the numeral "0" has to be arranged so far below that its downward movement for the purpose of printing the "0" upon the paper strip is so slight that it will not advance the counting-wheel. In order to secure the frames o in their position of rest and to guide them on their downward and upward oscillations, like-shaped fixed segments v are secured on the casing closely adjacent to the frames o , and in these segments are cut two circular grooves w and x , eccentric to each other and connected by short horizontal grooves. At the upper end of the groove x is a recess y , in which engages a pin z , secured to the frame o , whereby the position of rest of the frame o is secured. When for the purpose of effecting the engagement of a segment e with a counting-wheel a frame o is drawn forward, its pin z passes through the top cross-groove into the external circular groove w and upon the descent of the frame slides in said external groove until stopped by the stopping of the segment in consequence of the type on the handle now in use contacting with the paper, thereby guiding the movement. The cross-grooves are so disposed that the pin z on the protruding type striking the paper strip always comes opposite one of said cross-grooves, from which position the frame can be pushed back, passing the pin through a cross-groove into the inner groove x , whereby the segment is disengaged from its counting-wheel, and the frame is then moved upward into the position of rest, the pin z being during this latter movement guided in the inner groove x .

Having thus described my invention, I claim as new—

65 1. In an adding-machine, the combination

of a shaft, spring-actuated counting-wheels mounted thereon with capability of sliding sidewise, a parallel shaft and carrying-wheels loosely mounted thereon and gearing with the counting-wheels, and toothed driving means engaging the counting-wheels, and adapted to slide any desired number of them on their shaft so as to separate them from the remaining counting-wheels, substantially as described. 75

2. In an adding-machine, the combination of a shaft, spring-actuated counting-wheels mounted thereon with capability of sliding sidewise, a parallel shaft and carrying-wheels loosely mounted thereon and gearing with the counting-wheels, a shaft located parallel to the said shafts, and toothed segments gearing with the counting-wheels, mounted thereon, and each having a sector-shaped aperture for the shaft, and with the exception of the extreme right-hand segment, provided with a conical surface which in the advanced position of the segment slides the counting-wheels which lie to the right of it on their shaft, substantially as described. 85 90

3. In an adding-machine, the combination of a shaft, spring-actuated counting-wheels mounted thereon with capability of sliding sidewise, a parallel shaft and carrying-wheels loosely mounted thereon and gearing with the counting-wheels, a shaft located parallel to the said shafts, and toothed segments gearing with the counting-wheels, mounted thereon, and each having a sector-shaped aperture for the shaft, and with the exception of the extreme right-hand segment, provided with a conical surface, which in the advanced position of the segment slides the counting-wheels which lie to the right of it on their shaft, sector-shaped frames rigidly secured to the segments, draw-out type-bearing handles secured to the front of the frames, and a printing-surface below the handles, receiving the impression of the type on depression of the said handles, substantially as described. 95 100 105 110

4. In an adding-machine, the combination of a shaft, spring-actuated counting-wheels mounted thereon with capability of sliding sidewise, a parallel shaft and carrying-wheels loosely mounted thereon and gearing with the counting-wheels, a shaft located parallel to the said shafts, and toothed segments gearing with the counting-wheels, mounted thereon, and each having a sector-shaped aperture for the shaft, and with the exception of the extreme right-hand segment, provided with a conical surface, which in the advanced position of the segment slides the counting-wheels which lie to the right of it on their shaft, sector-shaped frames rigidly secured to the segments, draw-out type-bearing handles secured to the front of the frames, and a printing-surface below the handles, receiving the impression of the type on depression of the said handles, a pin secured to the top of 115 120 125 130

each said frame, a segment secured to a stationary part of the machine and having an outer and a recessed inner, eccentrically-running groove, and horizontal grooves connecting the same, in which said grooves and recess the said pin engages during the movements of the frames, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HERMANN EBERHARDT.

Witnesses:

ERNST KATZ,
ALBERT SCHENK.