

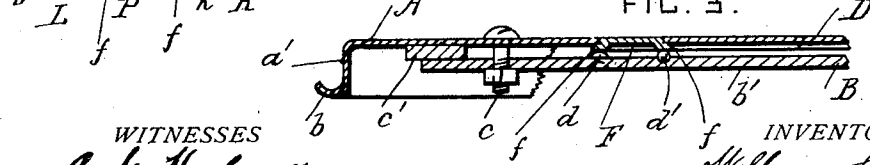
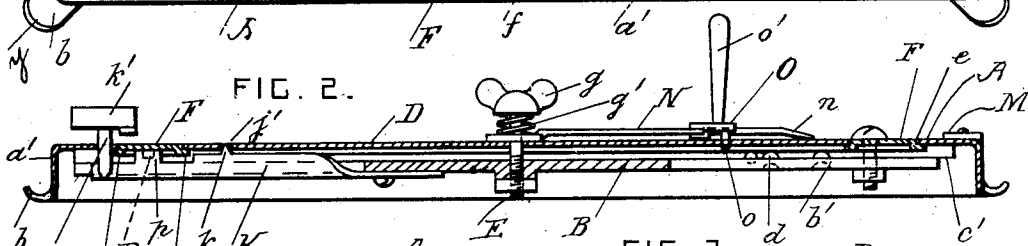
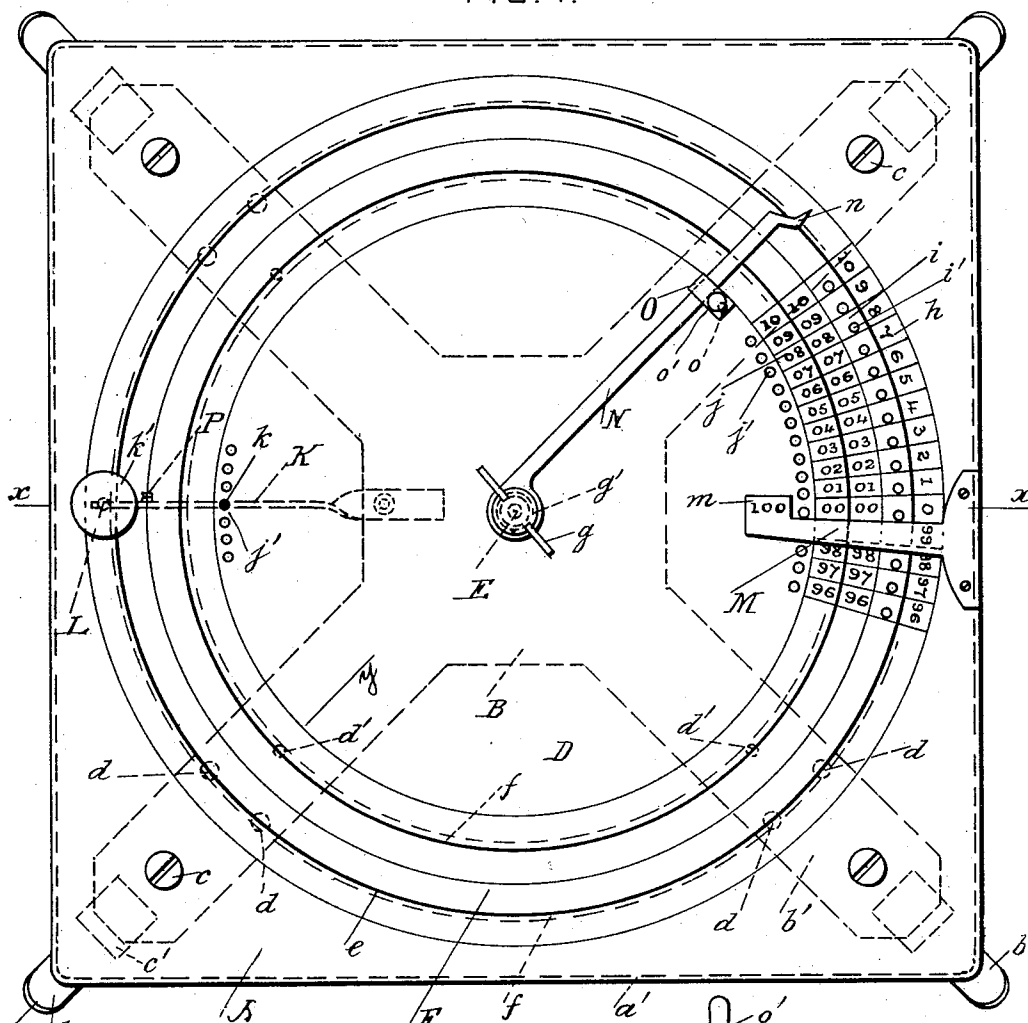
W. G. POWELL.
CALCULATING MACHINE.

(Application filed July 23, 1901.)

(No Model.)

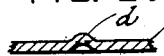
2 Sheets—Sheet 1.

FIG. 1.



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FIG. 3^a.



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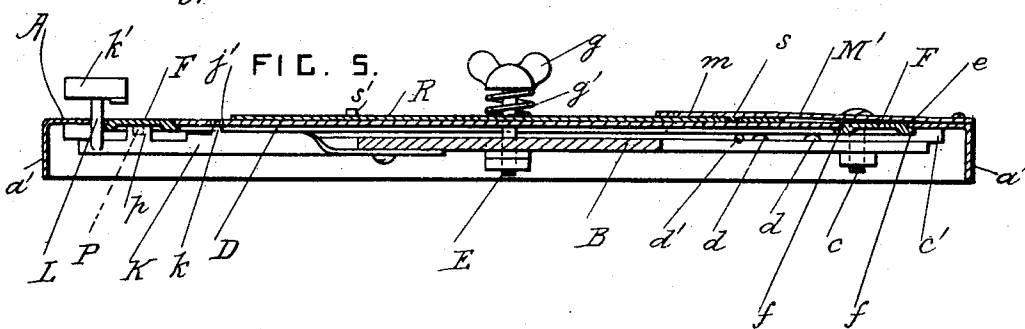
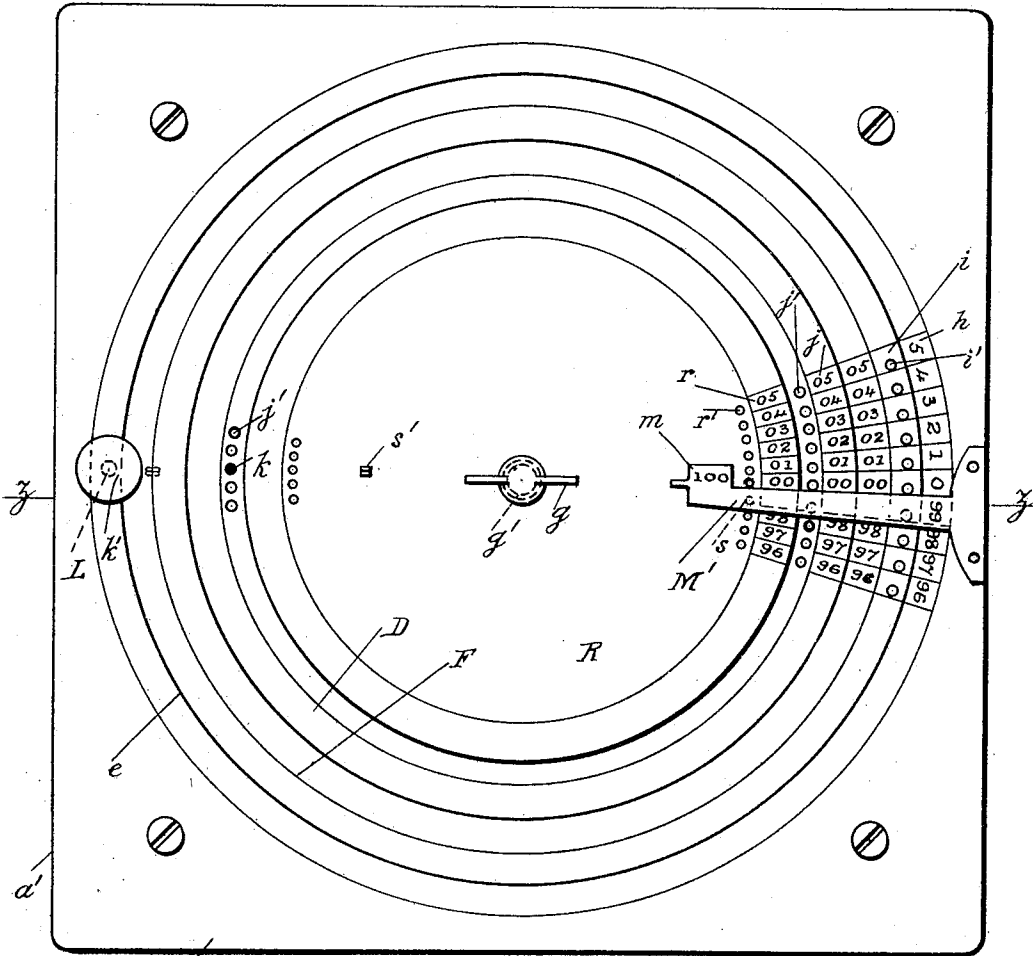
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(No Model.)

2 Sheets—Sheet 2.

FIG. 4.



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CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,611, dated June 3, 1902.

Application filed July 23, 1901. Serial No. 69,358. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. POWELL, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Calculating-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 appertains to make and use the same.

This invention relates to calculating-machines, and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a plan view of the machine. Fig. 2 is a cross-section taken on the line *x x* in Fig. 1. Fig. 3 is a section on line *y y* in Fig. 1, showing the bearings for the disk and ring. Fig. 3^a is a section through one of the concavo-convex projections *d*. Fig. 4 is a plan view showing a machine provided with an additional disk. Fig. 5 is a cross-section taken on the line *z z* in Fig. 4.

A is a front plate, provided with downwardly-projecting flanges *a'* at its edges and feet *b* at its corners. These flanges and feet are preferably formed integral with the plate A, the whole being stamped or pressed from a plate of sheet metal by suitable dies.

B is a back plate which is preferably shaped like a cross, having arms *b'*. The back plate is suspended from the front plate A by bolts *c*, and *c'* represents distance-pieces between the end portions of the arms and the front plate. The back plate is formed of metal, and it is provided with projections *d* on its upper surface. The bolts *c* regulate the position of the back plate. The front plate A is provided with a large circular hole *e*, and the back plate has a pin E in the center of the hole *e*.

D is a disk which is journaled on the pin E.

F is a ring interposed between the disk D and the plate A in the hole *e*. The ring F is provided with guide-flanges *f* at its edges, which project under the adjacent edges of the plate A and the disk D. The upper surfaces of the disk D, ring F, and the front plate A are arranged flush with each other,

and the flanges *f* of the ring F rest upon the projections *d* of the back plate.

In order that the ring F may be revolved easily, the projections *d* are arranged to support it with as little friction as possible. The projections *d* are preferably concavo-convex and are struck up or pressed up from the back plate, so as to form convex bearing-surfaces on the upper side of the back plate; but, if desired, the projections may consist of anti-friction-balls *d'*, which revolve in sockets in the back plate.

By reason of the front plate being provided with supporting-flanges *a'* at its edges and by reason of the back plate being provided with radial arms which are suspended by the bolts *c* from the angle or corner portions of the front plate the working parts of the machine which rest on the said arms are all suspended from the front plate and are supported by it independent of the table or desk upon which the flanges *a'* rest. This construction enables the machine to work freely under changes of temperature which expand and contract its parts, and the downward pressure of the fingers of the left hand which rest upon the top plate to steady the machine is communicated through the flanges *a'* to the table or desk without affecting the working parts of the machine.

The pin E has a thumb-nut *g* above the disk D, and *g'* is a spring interposed between the thumb-nut and the disk. The thumb-nut affords a means for regulating the pressure of the spring and prevents the disk from revolving too freely and enables the frictional contact of the disk with the ring to be regulated.

The front plate A is divided by radial lines into one hundred equal spaces *h* around the hole *e*, and these spaces are numbered from "0" to "99," consecutively. The ring F is also divided into one hundred spaces *i*, numbered to correspond with the spaces *h*, and each space *i* is provided with a hole *i'*. The disk D is divided by radial lines into one hundred equal spaces *j*, which are numbered to correspond with the spaces *h* and *i*, and each space *j* is provided with a hole *j'*. The ring F and the disk D each have one hun-

dred numbers, one hundred holes, and one hundred equal spaces, and the numbers are arranged on the spaces in line with the respective holes to which they pertain.

- 5 K is a spring-catch or spring-actuated catch which is secured at one end to the under side of the back plate B. This catch is formed of a flat strip of sheet metal which is twisted
10 near one end, so that the main portion is arranged edgewise, and it has a pin *k*, which projects upwardly into engagement with the holes *j'* of the disk D.

- L is a stud which projects upwardly from the free end of the catch through a hole in the
15 front plate A, and *k'* is a button on the upper end of the stud above the front plate A. The button *k'* overlaps the ring F and when depressed, so as to release the disk from the pin *k*, the button bears on the ring and forms a
20 friction-brake, which prevents it from being revolved.

- P is a trip on the under side of the ring F, which depresses the spring-catch automatically once in each revolution of the said ring,
25 engaging with a projection *p* on the catch between the flanges of the ring.

- M is a stop-bar which is secured to the upper side of the front plate A at its zero-space and which extends across the numbered
30 spaces of the disk and ring. The free end portion of the stop-bar has a lobe or lip *m*, which projects laterally and is arranged in line with the zero-space of the front plate. This lip is normally blank, and it may have
35 numerals "1," "2," "3," &c., placed on it in pencil or otherwise, so that they can be rubbed out and changed.

- N is a spring-arm which is pivoted on the pin E under the spring *g'*. This arm is provided with an offset pointer *n* at its free end
40 which points to the zero-space of the front plate A, so that the arm does not cover the spaces of the disk and ring, which are in line with the said zero-space. In this manner a
45 reading-space is formed between the said bar and arm.

- O is a guide which is slidable longitudinally on the arm N, and *o* is an operating-pin carried by the guide and engaging with the holes
50 of the disk or of the ring, according to the position of the guide on the said arm. A handle *o'* is provided for operating the said arm and pin.

- The machine shown in Figs. 1 to 3 is a ten-thousand-capacity machine which adds three and four columns at a time. It also has a provision for enabling it to indicate up to one million. Suppose the figures "3271," "935," and "321" are to be added in a column, thus
60 making a total of "4527:"

3271
935
321

65

4527

The machine is first set to zero, as shown in the drawings, zero showing on the disk and on

the ring close above the stop-bar and in line with zero on the front plate, and the disk being locked by the catch to the front plate. 70
The figures on the front plate are the index-figures for all operations and serve no other purpose. The figures "321," being portions of a column of three figures, are taken first. 75
The operating-pin is placed in the hole in the disk which comes opposite the index-figure "3" of the front plate. The push-button is pressed, so as to release the disk and hold the ring stationary, and the disk is revolved to the right by the operating-pin until it strikes 80
the stop-bar, when "300" will be shown at the reading-space. The push-button is then released, so as to free the ring and lock the disk. The operating-pin is then inserted in the hole of the ring opposite the index-figure "21" of 85
the front plate, and the ring is revolved until the operating-pin strikes the stop-bar, and "321" is shown at the reading-space. The next figures "935" are added to the "321" in a similar manner. The operating-pin is first 90
inserted in the hole of the disk opposite the figure "9" on the front plate, and the disk is released and turned until the pin strikes the stop-bar. The operating-pin is then inserted in the hole of the ring opposite the figure "35" 95
of the front plate, and the ring is then released and revolved until the pin strikes the stop-bar. This causes the figures "1221" to be displayed at the reading-space, and these figures are the sum of "321" and "935." The 100
remaining figures "3271," which are part of a column of four figures, are now added in a similar manner. The operating-pin is first inserted in the hole of the disk opposite "32" 105
on the front plate and then in the hole in the ring opposite the "71" on the front plate. The disk is moved first and then the ring, said disk and ring being released and locked alternately by means of the push-button and catch. When this has been accomplished, the 110
figures "4527" are displayed at the reading-space, and these figures are the sum of those selected as an example. When the sum of any column of figures closely approaches ten thousand, the numeral "1" is placed with a 115
pencil or otherwise temporarily on the lobe of the stop-bar as a memorandum. The machine is then adapted to add ten thousand more, as hereinbefore described, and when the sum closely approaches twenty thousand the 120
numeral "1" can be erased from the lobe and a numeral "2" substituted for it. Other numerals can be placed on the lobe as each additional ten thousand is added on the machine until "100" is placed on the lobe, thus enabling the machine to indicate up to one million. 125
Each time the ring makes one complete revolution its trip P depresses the spring-catch, and the disk D is revolved one space automatically by frictional contact with the said ring. The pin of the spring-catch then drops into the next hole of the disk and holds the disk stationary until the ring has made another complete revolution. 130

In one form of the machine the spring-arm may be dispensed with and the operating-pin and its handle may be held in the fingers like a pencil and placed in engagement with the holes of the ring and disk one after the other and moved into contact with the stop-bar, as hereinbefore described. This form of the machine is illustrated in Figs. 4 and 5, and it is also provided with an additional disk, so that larger total numbers may be added up. R is the additional disk, which is journaled on the pin E above the disk D. The disk R is divided into one hundred spaces r , which are numbered the same as the spaces h , i , and j , and each space r is provided with a hole r' . The stop-bar M' is now made of spring metal, and it is provided with a pin s at its free end which engages with the holes r' in the same manner as the pin k of the spring-catch K engages with the holes of the disk D. The disk D is provided with a trip s' for raising the pin s out of engagement with the disk R once in each revolution of the disk D. When the disk R is released, it is revolved by frictional contact with the disk D until the pin s drops into the next hole r' .

The operation of adding with the machine shown in Figs. 4 and 5 is the same as that hereinbefore described, and the sum of the numerals added is read off the disks and ring from the spaces which come in line with the zero-space of the front plate and close above the stop-bar.

What I claim is—

1. In a calculating-machine, the combination, with a front plate, a revoluble ring, and a disk journaled concentric with the said ring and provided with a circular series of holes; of a catch formed of a twisted strip of sheet metal secured at one end under the said parts and provided with a pin which engages with the holes of the said disk, and a stud which projects upwardly from the free end of the said catch through the said front plate and affords a means for disengaging the said catch-pin from the disk, substantially as set forth.

2. In a calculating-machine, the combination, with a front plate, a revoluble ring, and a revoluble disk; of locking mechanism which locks and releases the said ring and disk alternately to the said front plate, substantially as set forth.

3. In a calculating-machine, the combination, with a front plate, a revoluble ring, and a disk journaled concentric with the said ring and provided with a circular series of holes; of a catch provided with a pin which normally engages with one of the said holes, and a friction-brake which bears on the said ring when the catch-pin is disengaged from the disk, substantially as set forth.

4. In a calculating-machine, the combination, with a front plate, a revoluble ring provided with a circular series of holes, and a disk journaled concentric with the said ring and also provided with a circular series of

holes; of a stop-bar formed of a flat strip of sheet metal secured at one end only to the said front plate and projecting across the said ring and the adjacent holes of the disk, substantially as set forth.

5. In a calculating-machine, the combination, with a front plate, and a revoluble ring and a disk arranged concentric with each other; of a stop-bar formed of a flat strip of sheet metal secured at one end only to the said plate and having a laterally-projecting lobe at its free end over the said disk, substantially as set forth.

6. In a calculating-machine, the combination, with a front plate, and a revoluble ring and a disk each provided with a circular series of holes; of an arm pivoted concentric with the said ring and disk, and a guide slideable longitudinally on the said arm and carrying an operating-pin for engaging with the holes of either series, substantially as set forth.

7. In a calculating-machine, the combination, with a front plate provided with a zero-space, and a revoluble ring and a disk; of a stop-bar secured at one end to the said plate adjacent to the said zero-space and provided with a laterally-projecting lobe at its free end arranged over the said disk in line with the said zero-space, and an arm for operating the said ring and disk, said arm being pivoted concentric with the said ring and disk and provided with a laterally-offset pointer which points to the space on the said front plate in line with the said lobe, a reading-space being formed between the said bar and arm, substantially as set forth.

8. In a calculating-machine, the combination, with a front plate, and a revoluble ring and disk; of an additional disk pivoted concentric with the said ring and disk and provided with a circular series of holes, and a spring stop-bar secured to the said front plate at one end and provided at its free end with a catch-pin for engaging with the said holes of the additional disk, substantially as set forth.

9. In a calculating-machine, the combination, with a front plate, and a back plate secured to the front plate; of a ring provided with offset flanges which bear on the said back plate and having a trip between the said flanges, a disk journaled in the said ring and provided with a circular series of holes, and a spring-catch secured at one end to the back plate and provided with a pin which engages with the said holes and having a projection arranged in the path of the said trip between the said flanges, substantially as set forth.

10. In a calculating-machine, the combination, with a front plate provided with supporting-flanges, of a back plate suspended from the surface of the front plate above the bottom edges of the said flanges, and revoluble calculating mechanism supported by the said back plate, substantially as set forth.

11. In a calculating-machine, the combina-

- tion, with a front plate provided with supporting-flanges and a hole, of a back plate suspended from the surface of the front plate above the bottom edges of the said flanges, and a revoluble calculating-ring journaled in the said hole and provided with a peripheral flange which projects under the front plate and is supported by the said back plate, substantially as set forth.
- 10 12. In a calculating-machine, the combination, with a front plate provided with a hole, of a back plate secured to the front plate and provided with upwardly-projecting antifriction-bearings, and a revoluble calculating-
15 ring journaled in the said hole and resting on the said antifriction-bearings of the back plate, substantially as set forth.
13. In a calculating-machine, the combination, with a rectangular front plate provided
20 with supporting-flanges, of a back plate provided with radial arms which project under the corner portions of the front plate, fastening devices which secure the end portions of the said arms to the under side of the front plate, and revoluble calculating mechanism
25 supported by the said arms, substantially as set forth.
14. In a calculating-machine, the combination, with a front plate provided with a hole, of a back plate secured to the front plate, a
30 calculating-ring journaled in the said hole and supported by the said back plate and provided with an internal-projecting flange, a calculating-disk journaled in the said ring and resting on its said flange, and a tension
35 device supported from the said back plate and operating to press the said disk against the flange of the said ring so as to afford a prearranged frictional resistance, substantially as set forth.
- 40 In testimony whereof I affix my signature in presence of two witnesses.
- WILLIAM G. POWELL.
- Witnesses:
HERBERT W. T. JENNER,
LUTHER L. APPLE.