No. 639,112. Patented Dec. 12, 1899.

M. E. TEMPLE.

CALCULATING MACHINE.

(Application filed May 5, 1899.)

(No Model.) 4 Sheets—Sheet 1.

FIG. 1.

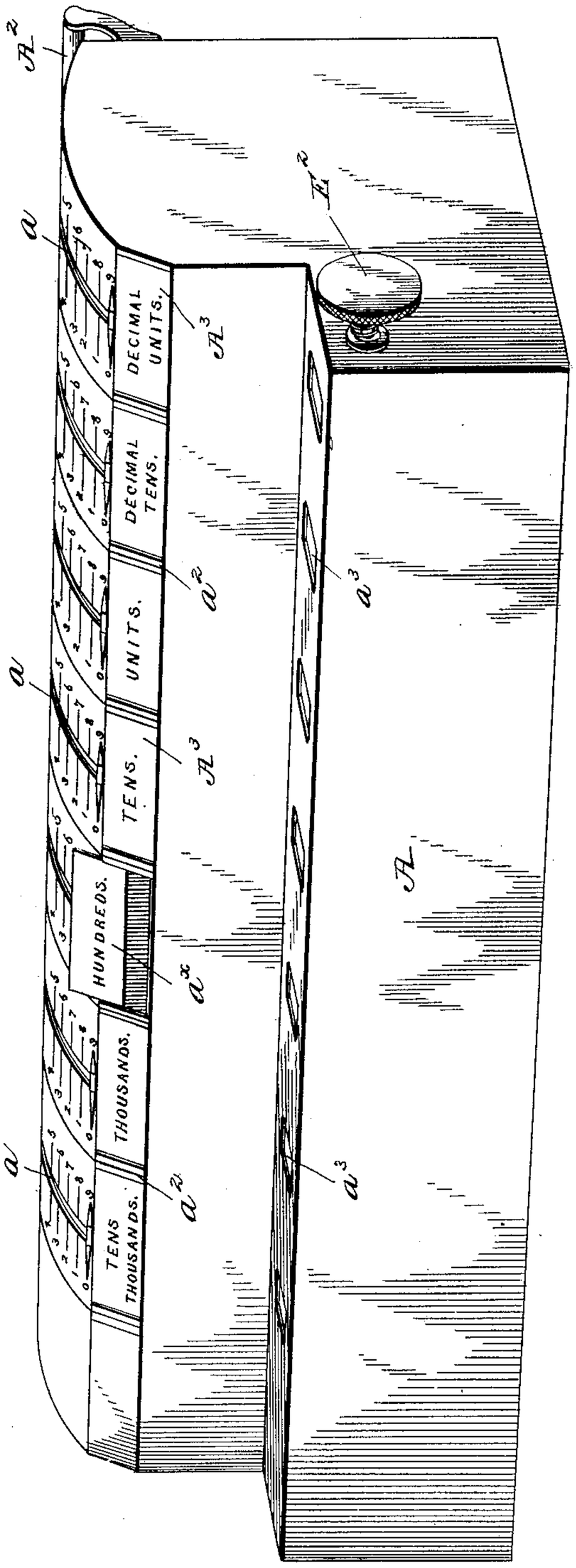


FIG. 6a.

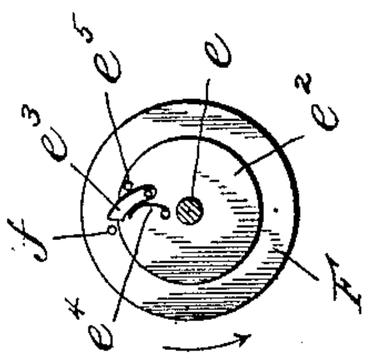


FIG. 6.

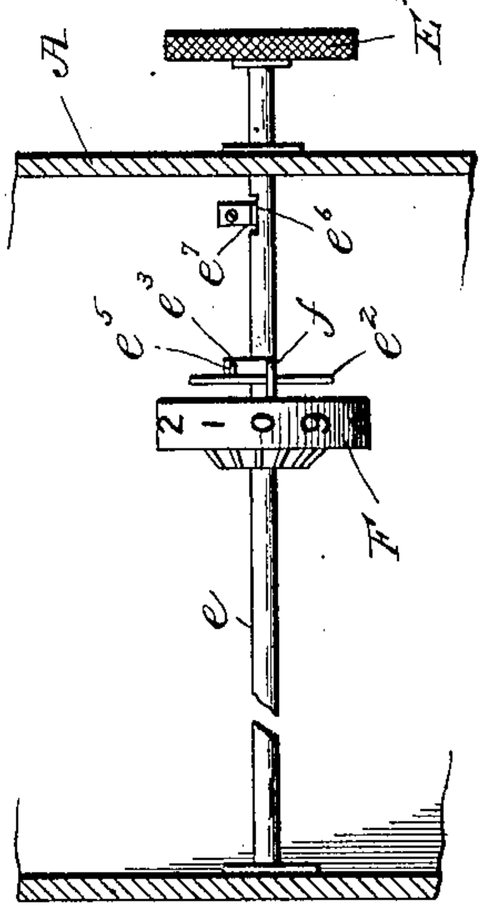
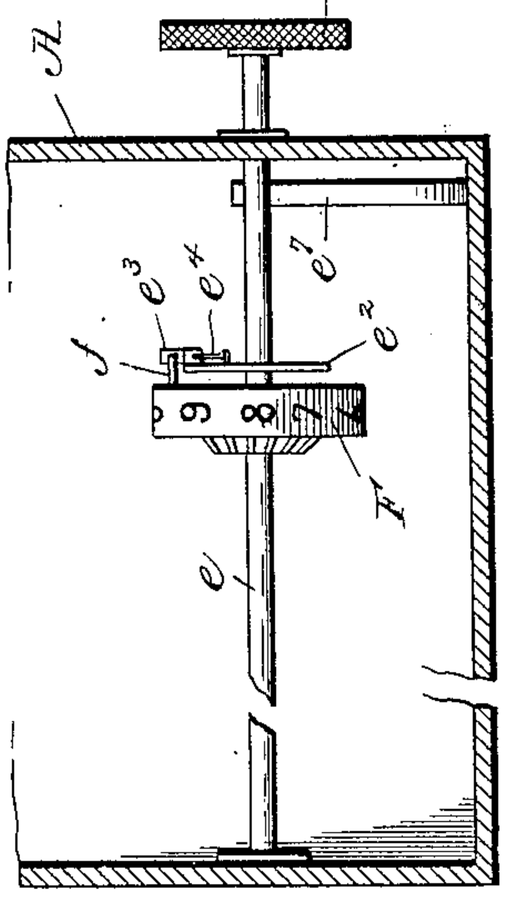


FIG. 5.



Witnesses

Harry L. Amer.

Attorney L. Woodard

Inventor

Morris E. Temple.

By- James L. Norris.

Attorney

No. 639,112.

Patented Dec. 12, 1899.

M. E. TEMPLE.

CALCULATING MACHINE.

(Application filed May 5, 1899.)

(No Model.)

4 Sheets—Sheet 2.

FIG. 2.

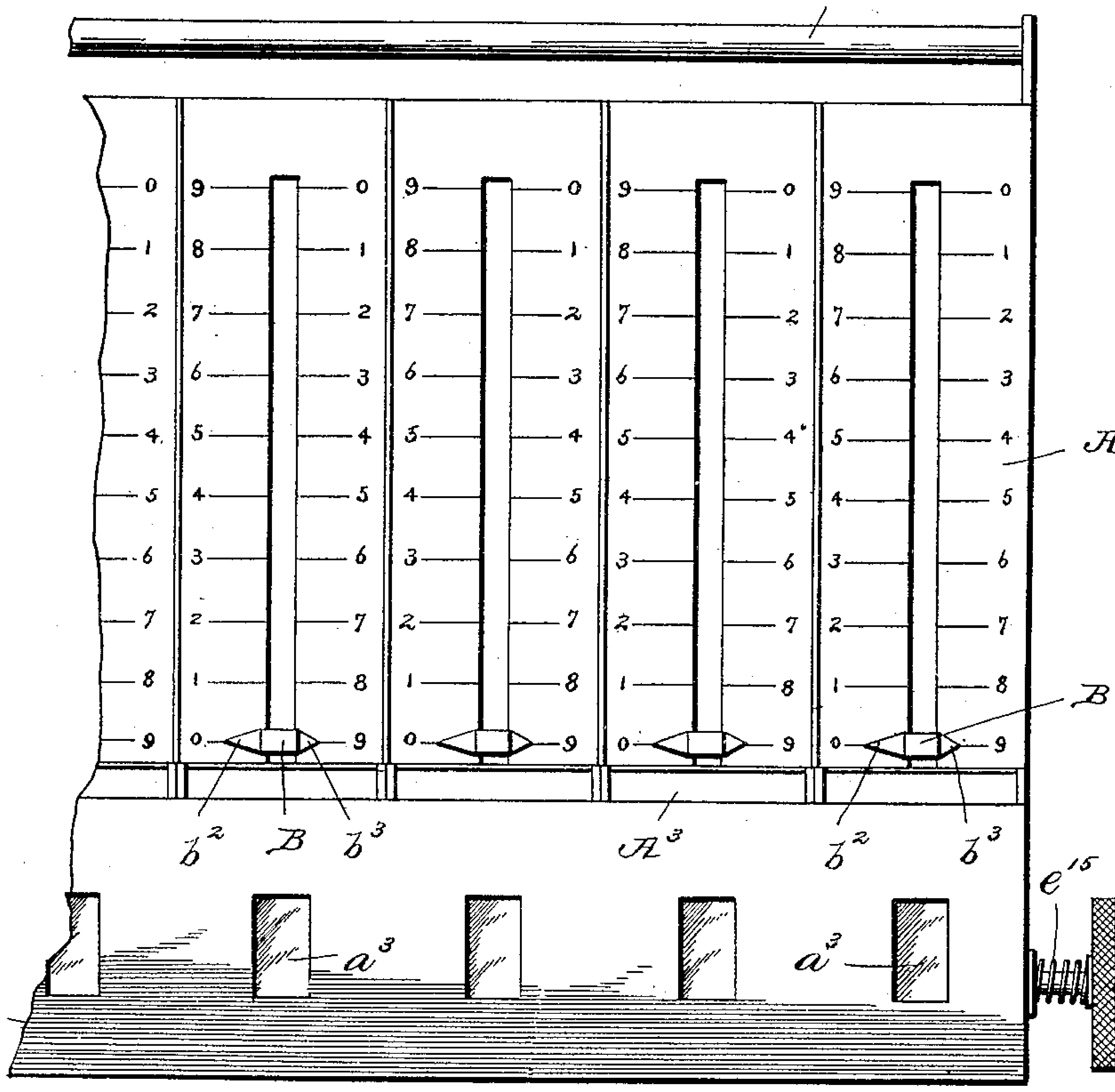
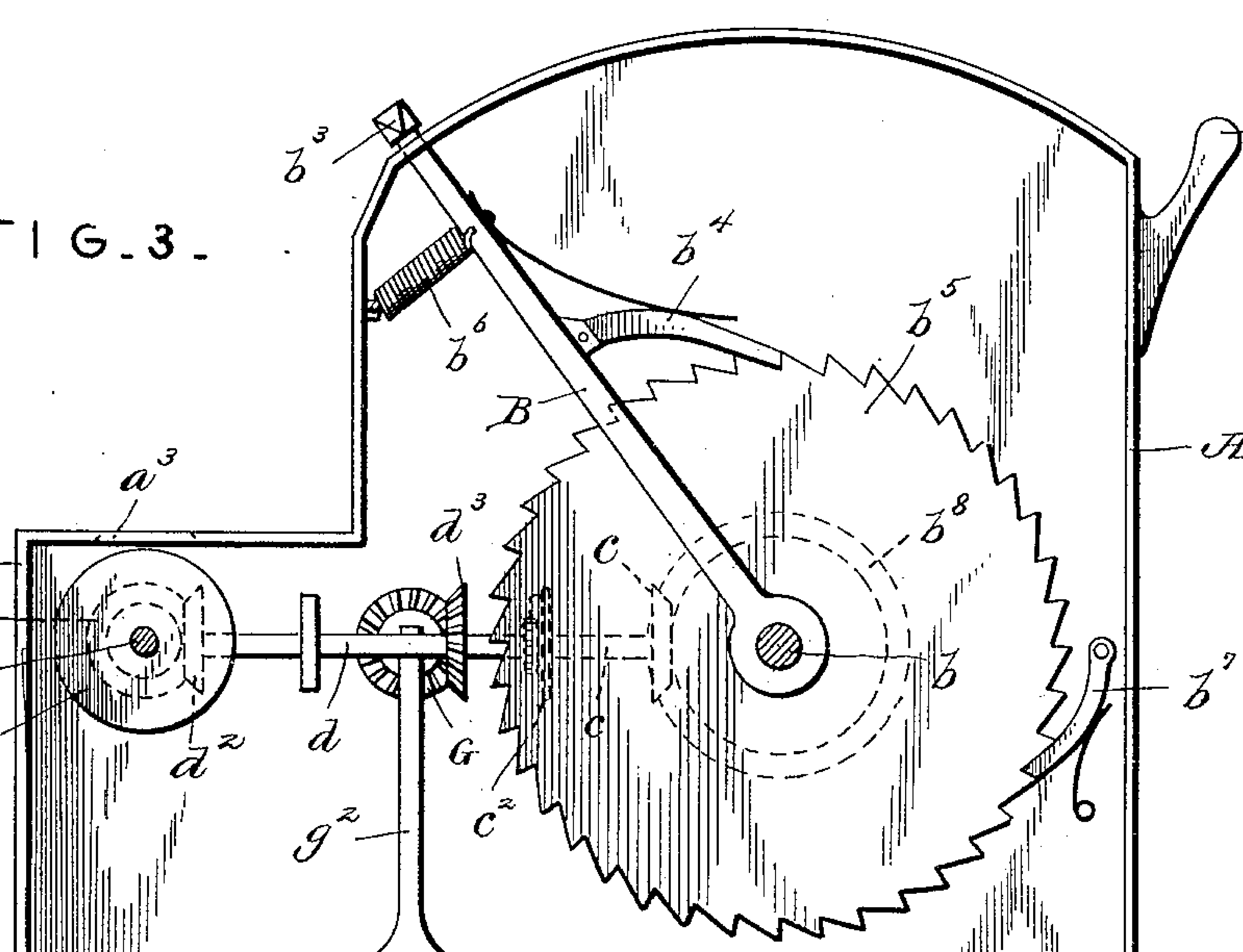


FIG. 3.



Witnesses

Harry L. Amer.

[signature]

Inventor

Morris E. Temple.

By James L. Norris

Attorney

No. 639,112. Patented Dec. 12, 1899.

M. E. TEMPLE.

CALCULATING MACHINE.

(Application filed May 5, 1899.)

(No Model.) 4 Sheets—Sheet 3.

FIG. 4.

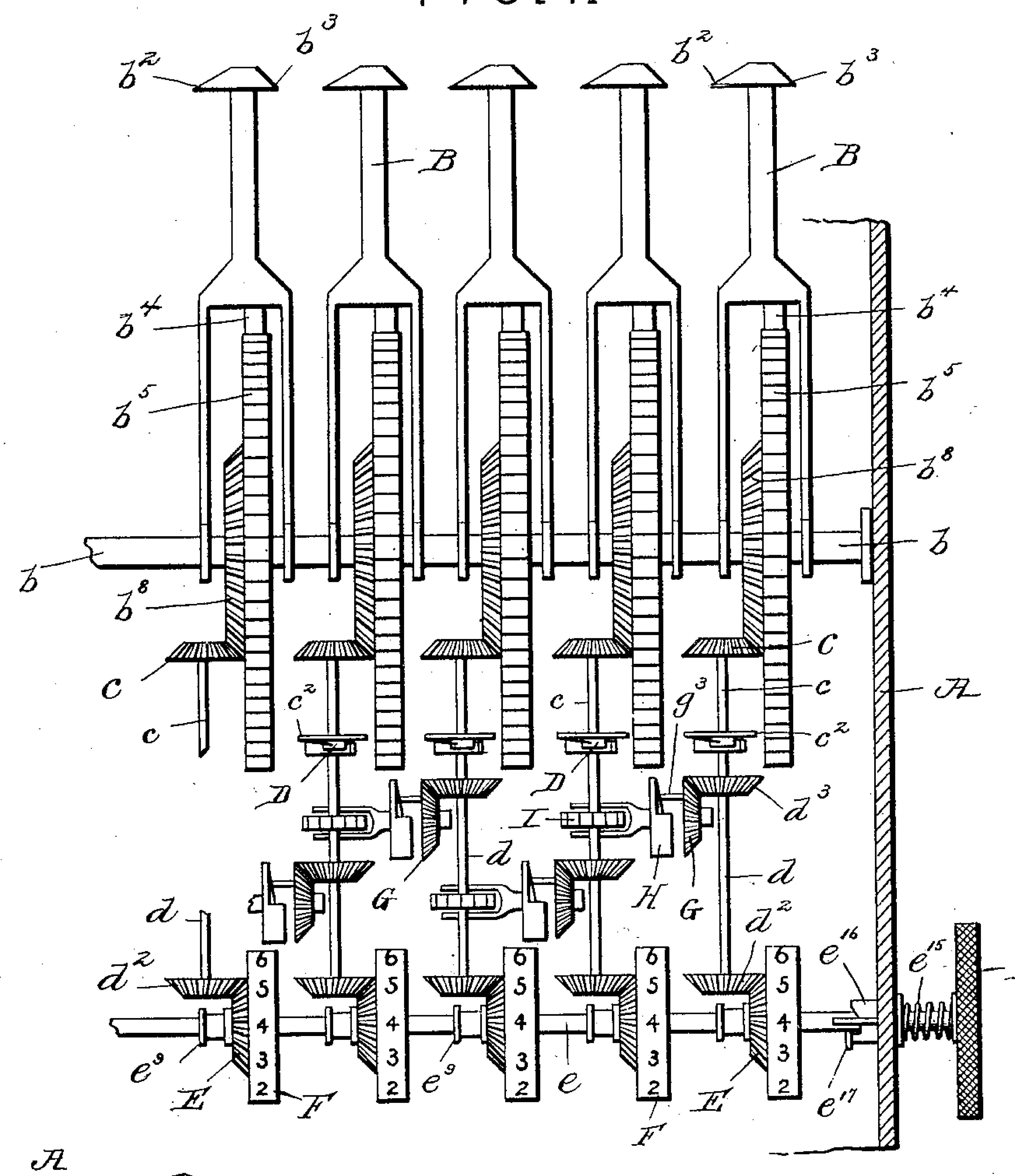
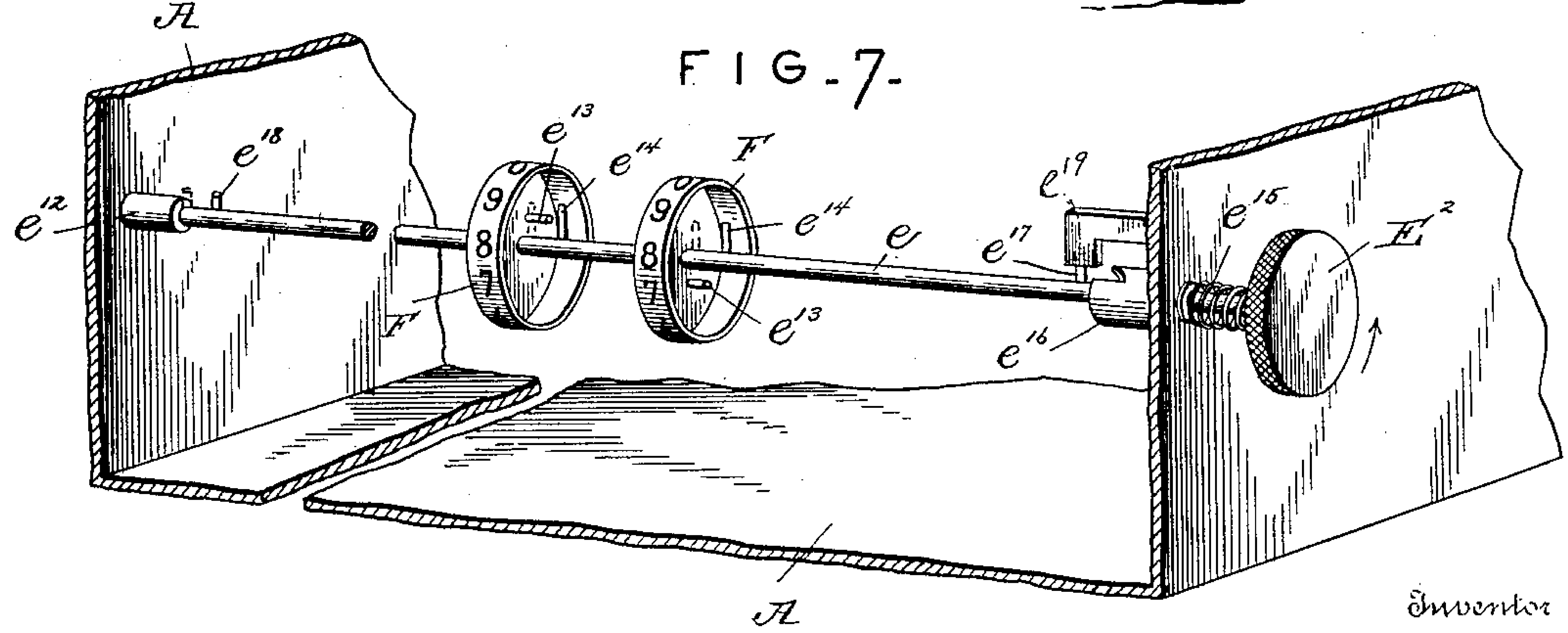


FIG. 7.



Witnesses
Harry L. Amer.
Albey S. Wetland

Inventor
Morris E. Temple.
By James L. Norris.
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 639,112. Patented Dec. 12, 1899.

M. E. TEMPLE.

CALCULATING MACHINE.

(Application filed May 5, 1899.)

(No Model.) 4 Sheets—Sheet 4.

FIG. 8.

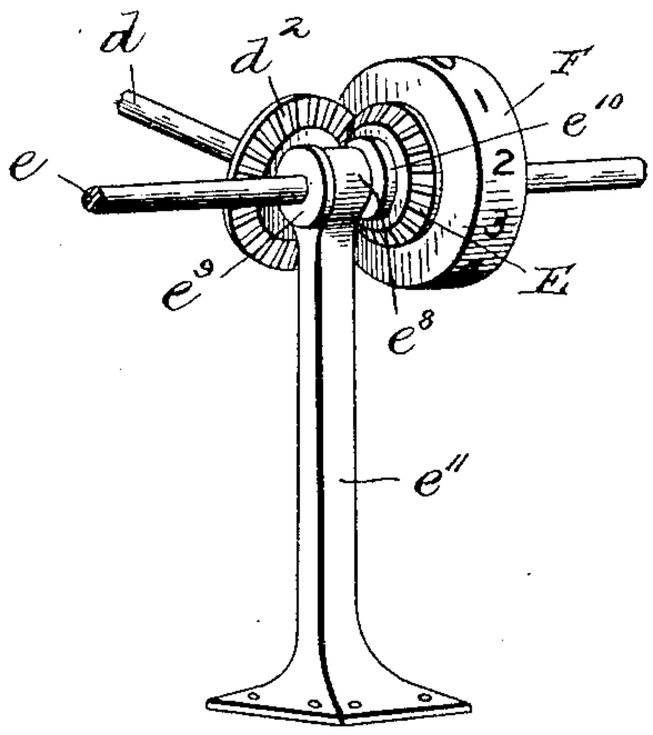


FIG. 8a.

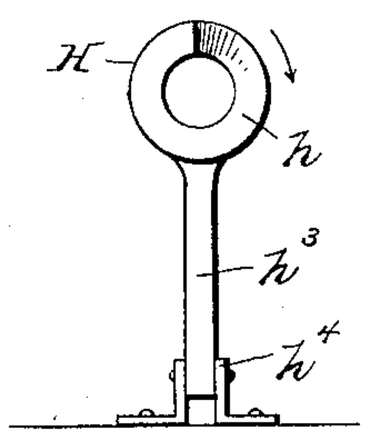


FIG. 9.

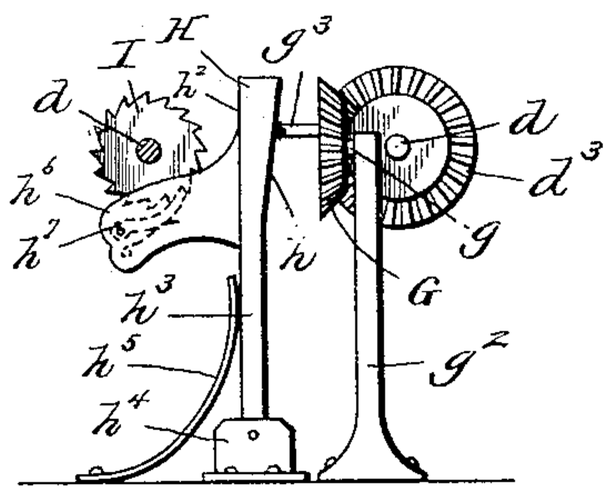


FIG. 10.

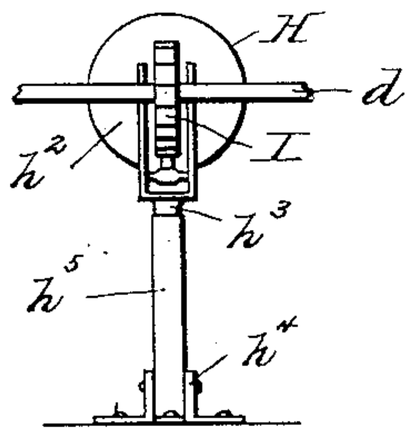


FIG. 11.

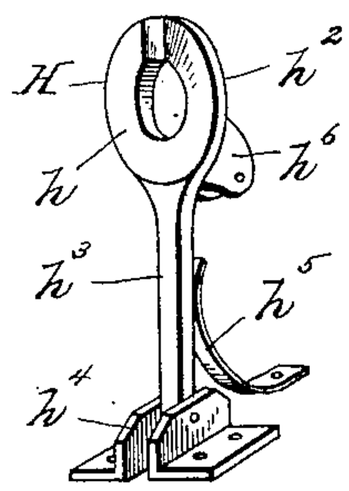
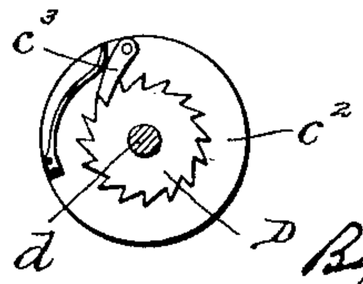


FIG. 12.



Witnesses

Harry L. Ames.

Mary E. Whitehead

Inventor

Morris E. Temple.

By James L. Norris.

Attorney.

UNITED STATES PATENT OFFICE.

MORRIS E. TEMPLE, OF CHATTANOOGA, TENNESSEE.

CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 639,112, dated December 12, 1899.

Application filed May 5, 1899. Serial No. 715,730. (No model.)

To all whom it may concern:

Be it known that I, MORRIS E. TEMPLE, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented new and useful Improvements in Calculating-Machines, of which the following is a specification.

The object is to provide a machine which may be operated with rapidity and absolute correctness to perform the fundamental arithmetical operations of addition, subtraction, multiplication, and division and which shall be of such simple construction—that is to say, composed of such a few number of parts—as to reduce danger of derangement and breakage in use to a minimum.

The invention consists in the novel construction and combination of parts of a calculating-machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate corresponding parts, Figure 1 is a view in perspective displaying the apparatus as it appears when ready for use. Fig. 2 is a detail view in plan of a portion of the casing of the apparatus, displaying the numeral scales or indices. Fig. 3 is a view in end elevation of the apparatus, an end of the casing being removed to show the relative arrangement of certain parts of the contained mechanism. Fig. 4 is a view in plan, partly in section, of the operating mechanism. Figs. 5 and 6 are detail views in elevation and plan, respectively, showing the preferred form of the resetting mechanism. Fig. 6^a is a detail view of the pawl mechanism of the resetting mechanism. Fig. 7 is a view in perspective of a modified form of resetting mechanism. Fig. 8 is a detail view in perspective, displaying one of the supports for the indicator-wheels. Figs. 8^a, 9, 10, and 11 are detail views of the carrying mechanism. Fig. 12 is a detail view of a part of a counter-wheel-operating mechanism.

Referring to the drawings, A designates the casing of the apparatus, which may be made of any suitable material and ornamented in any desired manner.

The form of the casing herein shown is one of many that may be employed, and it is therefore to be understood that I do not limit myself to this particular style.

The rear portion of the casing is higher than the front and is formed with a curved top provided with a plurality of transverse slots *a*, in which work the operating-levers B. On each side of each slot is a scale marked off into ten equal parts, each mark representing a digit from "0" to "9," inclusive. The scale on the left of the slot is designated as a "regular" or "fundamental" scale and is numbered from "0" to "9" and is used in performing calculations in addition and multiplication. The scale on the right of the slot is designated as a "complemental" scale and is numbered from "9" to "0" and is used in performing calculations in subtraction and division. The levers B, of which there may be any number—in this instance seven, representing a decimal-units lever, a decimal-tens lever, a units-lever, a tens-lever, and so on up to a tens-thousands lever—are loosely journaled on a transverse shaft *b*, fixed within the casing. Each lever projects beyond the casing and carries a head formed with two pointers b^2 b^3, respectively, of which the longer pointer b^2 traverses the regular scale and the shorter pointer b^3 the complemental scale, the difference in length between the two pointers serving as a visual means to indicate the proper scale, and thus obviate mistakes that would arise if both pointers were of the same length. Each lever carries a spring-pressed push-pawl b^4, adapted to engage with a ratchet-wheel b^5, also mounted on the shaft *b*, this wheel to have any desired number of teeth, preferably forty-five, and is to be so proportioned that when the pointer—say b^2— is moved, say, to the number "5" the wheel b^5 will be turned through an arc of a circle corresponding to five teeth, a spring b^6 serving automatically to return the lever when released.

The ratchet-wheel when moved is held against retrograde movement by a spring-pressed lock-pawl b^7, the spring of this latter pawl being of sufficient strength to prevent the ratchet-wheel from moving beyond a predetermined point by reason of any momentum due to rapid operation of the lever. It also serves the function of an audible indicator to notify the operator each time a tooth of the

ratchet-wheel has been passed, inasmuch as that every time the pointer passes over a mark on the scale this pawl will drop from one tooth to the next, making a clicking sound, so that the operator will know that the mark or number on the scale has been fully covered, and he may then release the lever to allow it to return to its normal position.

The ratchet-wheel has rigidly fixed to it a bevel-gear b^8, having the same number of teeth as the ratchet-wheel, and meshing with the gear b^8 is a ten-toothed bevel-gear C, mounted on one end of a shaft c, the other end of which carries a circular disk c^2. As the gear C, as stated, has ten teeth, it will therefore make one revolution for each complete swing of the pointer over the scales. The disk c^2 has pivoted to it a spring-pressed push-pawl c^3, which engages with and actuates a ten-toothed ratchet-wheel D, secured to one end of a shaft d, the other end of which carries a ten-toothed bevel-gear d^2, meshing with a ten-toothed bevel-gear E, mounted on a counter-shaft e, and rigidly secured to the gear E is a numeral-wheel F, bearing on its periphery figures from "0" to "9," inclusive.

From the description thus far given it will be seen that the motion imparted to the wheel b^5 will be imparted to the wheel C, thence by the shaft c to the disk c^2, thence by the ratchet-wheel D and pawl c^3 to the shaft d, and thence by the wheels d^2 and E to the indicator-wheel F. Since the wheels C, d^2, and E and ratchet-wheel D have each ten teeth, it will be seen that when the pointer b^2 is moved to, say, number "1" on the scale the indicator-wheel will revolve one-tenth of a revolution, and to whatever number the pointer may be moved the indicator-wheel will revolve the same number of tenths of a revolution. Should the indicator-wheel stand at "0" and the pointer b^2 be moved to number "6," the indicator-wheel would show the number "6." The lever on being released returns to "0", but the indicator-wheel remains at the point to which it was moved. Should the pointer now be moved to "2" on the scale, the indicator-wheel would revolve two-tenths of a revolution and show the figure "8," which is the sum of the two numbers.

Each indicator-wheel of the machine is actuated by a similar combination of gear-wheels, ratchet-wheels, shafts, &c., as that just described, so that a description of one will serve for all.

The mechanism for effecting the carrying of the decimal-units to the decimal-tens indicator-wheel and from this to the units-indicator wheel and from this to the tens-indicator wheel, and so on throughout the entire system, is the same for each order except the highest, when it is of course unnecessary, so that a description of one will serve for all.

To the shaft d is fixed a ten-toothed bevel-gear d^3, which meshes with a ten-toothed bevel-gear G, carried by an independent shaft g, supported by a standard g^2, suitably secured to the bottom of the casing, as clearly shown in Fig. 3. Projecting from the back of the gear G and at a point near its periphery is a pin g^3, the end of which is in contact with the surface of disk H, of the same diameter as the gear G and having a cam or snail face h and a plane back h^2. The disk H is carried by a support or arm h^3, pivotally mounted between brackets h^4, also secured to the bottom of the casing, as shown in Fig. 9, contiguous to the standard g^2. The cam-face of the disk is kept in contact with the pin g^3 by a spring h^5, as clearly shown in Fig. 11, and it will be seen that as the gear G revolves the pin g^3 will push back the disk H by riding up the incline of the cam. The instant the pin g^3 passes the shoulder of the cam the disk is forced forward again by the action of the spring h^5, the direction of movement of the pin on the cam being indicated by the arrow in Fig. 8. The back or plane surface h^2 of the disk is provided with two parallel arms h^6, between which is pivoted a spring-pressed push-pawl h^7, as shown in Fig. 9, which is so arranged as to actuate a ten-toothed ratchet-wheel I, carried by the shaft d of the next higher order. The pitch of the cam h is such that when the pin g^3 passes the shoulder of the cam and the disk is forced forward by the spring h^5 the pawl h^7 turns the ratchet-wheel I the distance of one tooth. The ratchet-wheel I being rigid with the shaft d, which operates the indicator-wheel of the next higher order, it will be seen that when the ratchet-wheel I is moved the distance of one tooth the indicator-wheel will make one-tenth of a revolution. By properly timing the wheel G, so that when the indicator-wheel is made to pass from the number "9" to "0," the pin g^3 will pass the shoulder of the cam and the disk will be forced back and will cause the indicator-wheel of the next higher order to revolve one-tenth of a revolution, thereby carrying the "one." The spring h^5 must be of considerable strength, as when in the act of returning the disk to its normal position it must also turn the ratchet-wheels I and D, the shaft d, the gears d^2, and the gear E, with its indicator-wheel, and also this spring incidentally operates the carrying mechanism of the next order. To reduce the friction of the carrying mechanism, the pin g^3 may be provided with a roller where it contacts with the cam.

In order to effect resetting of the machine when desired, the indicator-wheels F are loosely mounted on the shaft e, and firmly attached to the shaft adjacent to each indicator-wheel is a circular disk e^2, carrying a pawl e^3, pivoted so that it projects some little distance beyond the periphery of the disk, the pawl being held in position by a spring e^4 on one side and by a pin e^5 on the other side. The indicator-wheel is also provided with a pin f, which projects a short distance beyond the disk and near its periphery. It will be seen that when the indicator-wheel is revolved in

the regular course of the operations of the machine in the direction indicated by the arrow in Fig. 6[a] the pin *f* will come into contact with the pawl e^3, depress it against the spring e^4, and pass by it without interruption. It will also be seen that when the shaft *e* is revolved in the direction indicated by the arrow, through the medium of the resetting-wheel E^2, the pawl e^3 will at some time during the revolution come into contact with the pin *f*, and being braced by the pin e^5 will cause the indicator-wheel to revolve also. The pins *f* are set at a specific point with reference to the numbers on the indicator-wheels, so that all the wheels may be made to exhibit zero.

At a point on the shaft *e* near where it projects through the casing it has a cut-away portion e^6, leaving a flat surface. A spring e^7 is attached at one end to the bottom of the casing, and its other end presses against the flat surface of the shaft, and by this means the shaft is held in its normal position. As soon as the shaft is revolved the spring is forced back, and when the shaft has completed its revolution and all the indicator-wheels are brought to zero the spring will fall back against the flat surface and hold it in that position.

In order to facilitate the use of the machine by enabling an operator at a glance to ascertain the value of a number on any indicator-wheel, a plurality of designating-cards A^3 are employed, one for each indicator-wheel, the number printed on the card corresponding to the recording value of the indicator-wheel over which it is placed, beginning in this instance with a "decimal-units" card and terminating with a "ten-thousands" card. These cards are adapted to be removed and shifted at will and are thus interchangeable. The reason for this arrangement is, if desired, to change the value represented by the indicator-wheels. Thus if it be desired to adapt the machine to calculate only from units onward the "decimal-units" and "decimal-tens" cards would be removed and the remainder of the cards would be shifted two spaces to the right, thus bringing the units-card over the indicator-wheel that before constituted the decimal-units wheel and changing the recording value of this wheel accordingly. Other permutations of these cards may be made to suit conditions arising in the use of the machine.

In using the machine the operator moves the lever with the thumb of the right hand, at the same time resting the fingers on the rest-bar A^2. The interchangeable designating-cards A^3 are set adjacent to each set of numeral-scales and at such an angle as to be conveniently seen by the operator. These cards are slid into grooves in the moldings a^2. The card marked $a^\times$ shows a card partly removed. The result of the operation is read through openings a^3, which are of a size to permit exhibiting but one figure on each indicator-wheel at a time.

In Figs. 7 and 8 there is shown a slightly-modified arrangement of resetting mechanism, which may be employed in lieu of that shown in Figs. 5 and 6. In that form shown in Figs. 7 and 8 the gear E is shown as provided with a collar or sleeve e^8, provided with two flanges e^9 e^{10}. The resetting-shaft *e* extends through this sleeve and fits loosely therein, so that it may be revolved and be moved laterally without changing the position of the gear E and its indicator-wheel, the sleeves being held for operation by supports or standards e^{11}, secured to the floor of the casing. By the arrangement shown the indicator-wheel and the gear are supported independently of the shaft *e*.

One extremity of the shaft *e* is mounted in a bearing e^{12}, secured to an end of the casing, and the other extremity of this shaft projects outward beyond the other end of the casing and carries a resetting-wheel E^2, by which the shaft may be turned.

The indicator-wheels are "cupped" and are each provided with pin e^{13}, extending parallel with the shaft *e*, these pins being set at specific points with reference to the numbers on the indicator-wheels. The shaft *e* is provided adjacent to each indicator-wheel with a pin e^{14}, so set upon the shaft that when the latter is in its normal position the pins e^{13} e^{14} will not contact when the indicator-wheels are turned, the shaft being held in its normal position by a spring e^{15} and a notched hollow boss e^{16}, projecting inward from the inner side of the casing. When the shaft is in its normal position, a pin e^{17} is in the notch of the boss e^{16}, as shown in Fig. 4; but when the apparatus is to be reset the wheel E^2 is pressed in toward the case of the machine, thereby moving the pin e^{17} out of the said notch and leaving the shaft *e* free to turn. This inward movement of the shaft also brings the pins e^{14} into position to engage with the pins e^{13} of the indicator-wheels, the lateral movement of the shaft being limited by a pin e^{18} on the shaft *e* abutting against the bearing e^{12}. The wheel E^2 is now turned in the direction of the arrow in Fig. 7, so that at some time in the revolution of the shaft each of the series of pins e^{14} will engage with each of the series of pins e^{13} and move the indicator-wheels to position to exhibit "0." When this position has been resumed by all of the indicator-wheels, further rotation of the shaft *e* is prevented by the pin e^{17} contacting with a stop e^{19}, projecting inward from the side of the casing. The wheel E^2 is then released and the spring e^{15} will operate automatically to move the shaft *e* laterally and bring the pin e^{17} into the notch of the boss e^{16}, and thereby locks the shaft *e* against further rotation at the time.

The numeral-scales used in this machine are not, strictly speaking, complementary to each other, but are complements of nine. It will be seen that when adding the numbers set opposite each other in the two scales the sum in each instance is nine. It is therefore

necessary to add one to the right-hand column each time the complemental scale is used.

The operation of subtraction is performed on this machine in the following manner: Place the minuend on the indicators by passing the lever-pointers to the corresponding numbers on the fundamental scale. Then commence at the right and pass the pointers to the figures on the complemental scale corresponding to the figures in the subtrahend and add one to the right-hand column. After all the figures in the subtrahend have thus been registered according to the complemental scale pass the pointers of each succeeding order to "0" on the complemental scale. The result will then appear on the indicator-wheels.

Example: Subtract one hundred and eighty-four from eight hundred and seventy-five. In performing this operation according to the above instructions the following takes place: The minuend is registered and the indicators exhibit "0000875." The subtrahend is then registered according to the complemental scale and one added to the right-hand column. This is equivalent to adding the number "9999816." The indicator will then exhibit the number "0000691," which is the correct result.

The operation of multiplication is performed on this machine in the following manner: In multiplication the fundamental scale only is used. Commence at the right-hand column of the machine and pass the pointer to the number on the scale indicated by the right-hand number in the multiplicand as many times as indicated by the right-hand number of the multiplier. Then pass the pointer of the next higher column to the number on the scale indicated by the second figure (from the right) of the multiplicand as many times as indicated by the right-hand figure of the multiplier, and so on until each figure of the multiplicand has been registered (in its proper column) the number of times indicated by the right-hand figure of the multiplier. At this stage of the operation the indicators show the result obtained by multiplying the multiplicand by the right-hand figure of the multiplier. Then commence with the second column (from the right) and pass the pointer to the figure on the scale indicated by the right-hand figure of the multiplicand as many times as indicated by the second figure of the multiplier, and, as described above, each figure of the multiplicand will be registered (in the proper column) as many times as indicated by the second number of the multiplier.

It will be noticed that each time the multiplicand is multiplied by a new number of the multiplier the operation commences in the next higher column from that in which it commenced before.

When the operation has been executed as above described for each number of the multiplicand and multiplier, the indicators will exhibit the correct result.

Example: Multiply three hundred and seventy-five by four hundred and fifty-two. Pass the pointer of the right-hand or units column to the figure "5" two times. This will cause the machine to register "10." Pass the pointer of the tens-column to "7" two times. This will cause the indicators to show "150." Pass the pointer of the hundreds-column to "3" two times. This will cause the indicators to show "750." Now the pointer of the tens-column is passed to "5" five times. This will cause the indicators to show "1000." Pass the pointer of the hundreds-column to "7" five times. This will cause the indicators to show "4500." Pass the pointer of the thousands-column to "3" five times. This causes the indicators to show "19500." Now the pointer of the hundreds-column is passed to "5" four times. This will cause the indicators to show "21500." Pass the pointer of the thousands-column to "7" four times. This will cause the indicators to show "49500." Pass the pointer of the ten-thousand-column to "3" four times. This causes the indicators to show "169500," which is the correct result desired.

The above-described method of performing multiplication is purely mechanical. The operator does not do any multiplying, adding, or carrying mentally. It is all automatically performed by the machine. A much shorter and quicker method might be used by the operator mentally multiplying each number of the multiplicand by each of the multiplier and registering these results in the proper columns.

One method of performing division on this machine is accomplished by using the following example: Let it be required to divide fifty-three thousand five hundred and forty-one by four hundred and thirty-seven. First register the dividend on the indicators "53541." It will be seen at a glance that the divisor is contained in the first partial dividend but one time. Then in the column occupied by the first partial dividend register the divisor one time on the complemental scale, (adding the one to the right-hand column.) This is the same as adding the number "563." This will cause the indicators to show the number "109841." Of this number the "1" on the left is the first figure of the quotient and the "984" is the new partial dividend. It will be seen at once that the divisor is contained in the new partial dividend two times. Then register in the columns occupied by the new partial dividend the divisor twice according to the complemental scale, (always adding the "1126" one to the right.) This will cause the indicator to show "121101." Of this number the "1" and "2" on the left are the first two numbers of the quotient and the "1101" is the new dividend. The divisor is contained in this dividend two times. There-

fore register the divisor two times on the complemental scale. This is the same as adding the number "1126." The indicators will then show the number "122227." Of this number "122" is the quotient and "227" is the remainder and shows the result of the division to be "122 $\frac{227}{437}$."

In cases where it is apparent that the quotient will be a small number the result can be obtained by successively subtracting the divisor until it is no longer contained in the dividend.

Example: eighteen hundred and forty-nine divided by four hundred and twenty. First register the dividend "1849" and then register the divisor on the complemental scale "580." The indicators will show the number "2429." Again, register the divisor on the complemental scale "580." The indicators will show the number "3009." Again, register the divisor on the complemental scale "580." The indicators will show the number "3589." Again, register the divisor on the complemental scale "580." The indicators will show the number "4169." It will be seen now that the divisor is no longer contained in the remaining dividend and that the result has been obtained "4 $\frac{169}{420}$."

In examples of this character the quotient appears in the column first occupied by the left-hand figure of the dividend. As the divisor is successively subtracted the quotient-figure becomes larger. The figures which appear to the right of the quotient compose the new dividend. When the divisor can no longer be subtracted from the new dividend, the result is reached, and the new dividend is the final remainder.

I claim—

1. In a calculating-machine, a shaft bearing a plurality of ratchet-wheels each having a predetermined number of teeth, pawl-carrying levers for operating the ratchet-wheels in one direction only, a bevel-gear carried by each ratchet-wheel and having its teeth corresponding in number to those of the ratchet-wheel, a shaft carrying at one end, a ten-toothed bevel-gear in mesh with the first-named gear, and at its opposite end a disk, a pawl carried by the disk, a shaft carrying at one end a ten-toothed ratchet-wheel actuated from the said pawl, an indicator-wheel carrying a ten-toothed bevel-gear and a ten-toothed bevel-gear carried by the last-named shaft and meshing with the bevel-gear of the indicator-wheel, substantially as described.

2. In a calculating-machine, a shaft bearing a plurality of ratchet-wheels, each having a predetermined number of teeth, pawl-carrying levers for operating the ratchet-wheels in one direction only, a bevel-gear carried by each ratchet-wheel and having its teeth corresponding in number to those of the ratchet-wheel, a shaft carrying at one end a ten-toothed bevel-gear in mesh with the first-named gear, and at its opposite end a disk, a pawl carried by the disk, a shaft carrying a ten-toothed ratchet-wheel actuated from the said pawl, an indicator-wheel carrying a ten-toothed bevel-gear, a ten-toothed bevel-gear carried on the last-named shaft, and meshing with the bevel-gear of the indicator-wheel, and an intermediate bevel-gear on the last shaft for imparting motion to the next order of actuating mechanism.

3. In a calculating-machine, a shaft bearing a plurality of ratchet-wheels each having a predetermined number of teeth, pawl-carrying levers for operating the ratchet-wheels in one direction only, a bevel-gear carried by each ratchet-wheel and having its teeth corresponding in number to those of the ratchet-wheel, a shaft carrying at one end a ten-toothed bevel-gear in mesh with the first-named gear, and at its opposite end a disk, a pawl carried by the disk, a shaft carrying a ten-toothed ratchet-wheel actuated from the said pawl, an indicator-wheel carrying a ten-toothed bevel-gear, a ten-toothed bevel-gear carried on the last-named shaft and meshing with the bevel-gear of the indicator-wheel, an intermediate bevel-gear in mesh with a similar gear of the next order of actuating mechanism, a pin on the back of the intermediate gear, a pivoted spring-held standard having a snail with which said pin contacts, and a pawl carried by the said standard and operating the counting mechanism of the next higher order, and so on throughout the entire succeeding orders of mechanism.

4. In a calculating-machine, a shaft bearing a plurality of ratchet-wheels each having a determinate number of teeth, pawl-carrying levers for operating the ratchet-wheels in one direction only, a bevel-gear carried by each ratchet-wheel and having its teeth corresponding in number to those of the ratchet-wheel, a shaft carrying at one end a ten-toothed bevel-gear in mesh with the first-named gear, and at its opposite end a disk, a pawl carried by the disk, a shaft carrying at one end a ten-toothed ratchet-wheel actuated from the said pawl, an indicator-wheel carrying a ten-toothed bevel-gear, a ten-toothed bevel-gear carried by the last-named shaft and meshing with the bevel-gear of the indicator-wheel, and means adapted upon lateral movement and rotation of the indicator-wheel-bearing shaft to move the indicator-wheel back to a point to exhibit zero through a sight-opening in the machine-casing, substantially as described.

5. In a calculating-machine, a casing provided with slots, and interchangeable designating-cards arranged adjacent to the slots, a shaft arranged within the casing and bearing a plurality of ratchet-wheels, each having a predetermined number of teeth, pawl-carrying levers for operating the ratchet-wheels in one direction only, a bevel-gear carried by each ratchet-wheel and having its teeth corresponding in number to those of the ratchet-wheel, a shaft carrying at one end a ten-toothed gear in mesh with the first-named

gear, and at its opposite end a disk, a pawl carried by the disk, a shaft carrying a ten-toothed ratchet-wheel actuated from the said pawl, an indicator-wheel, arranged immediately below one of the slots in the casing, said indicator-wheel carrying a ten-toothed bevel-gear, a ten-toothed bevel-gear carried on the last-named shaft, and meshing with the bevel-gear of the indicator-wheel, and an intermediate bevel-gear on the last-named shaft for imparting motion to the next order of actuating mechanism, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MORRIS E. TEMPLE.

Witnesses:
A. R. McKENZIE,
W. F. KALB.