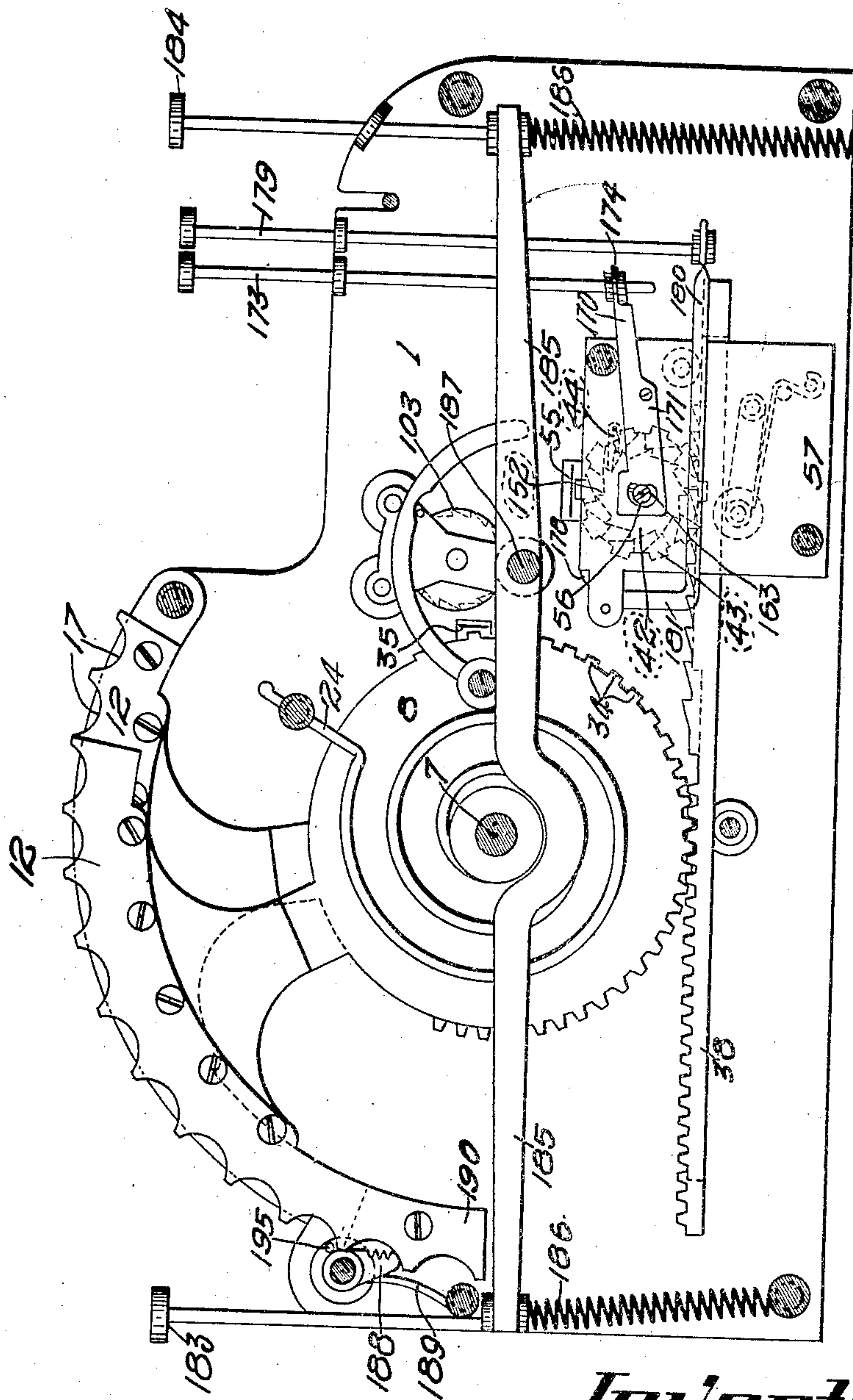


924,256.

A. J. MEIER.
CALCULATING MACHINE.
APPLICATION FILED SEPT. 18, 1907.

Patented June 8, 1909.
4 SHEETS—SHEET 1.

Fig. 1.



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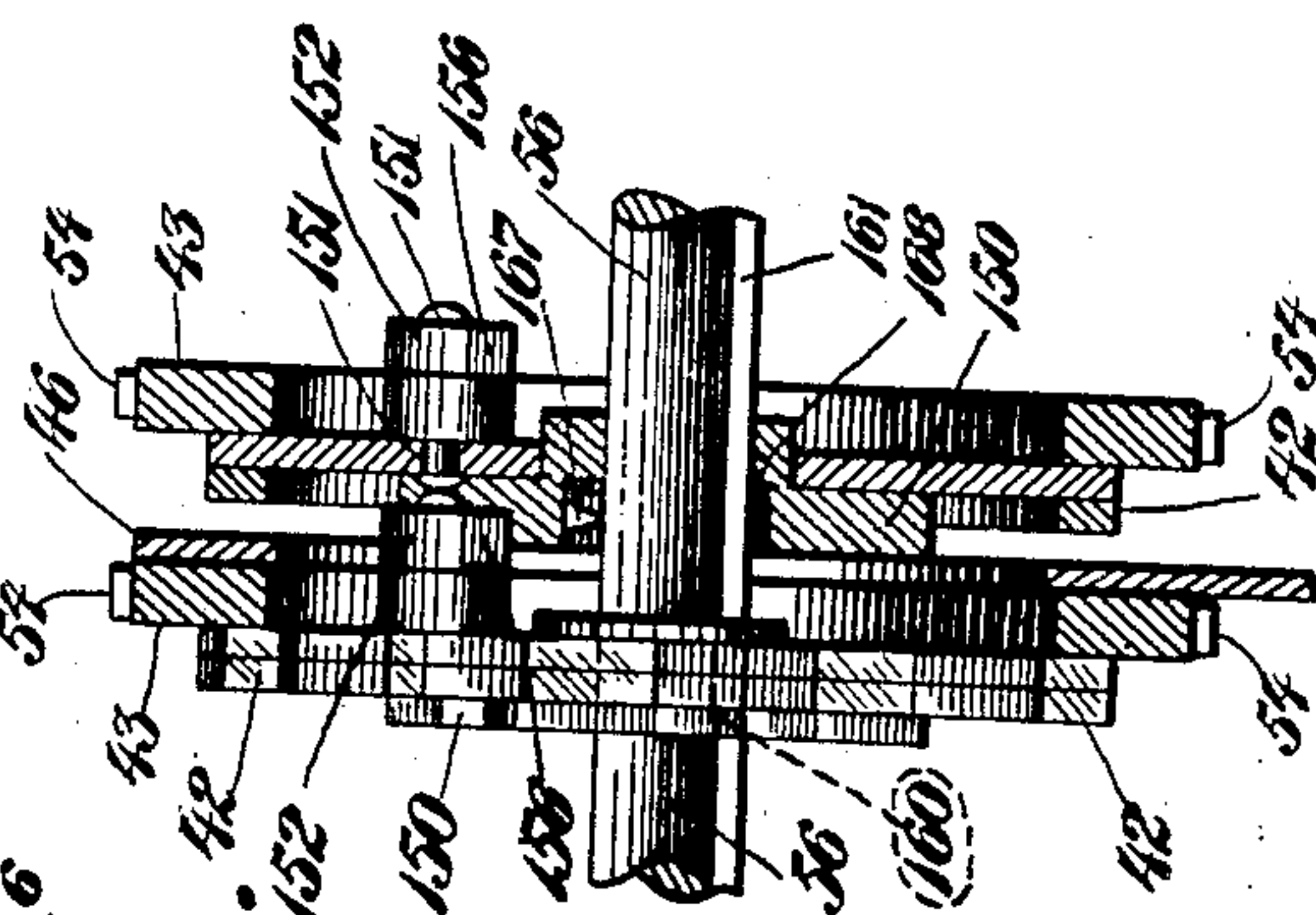
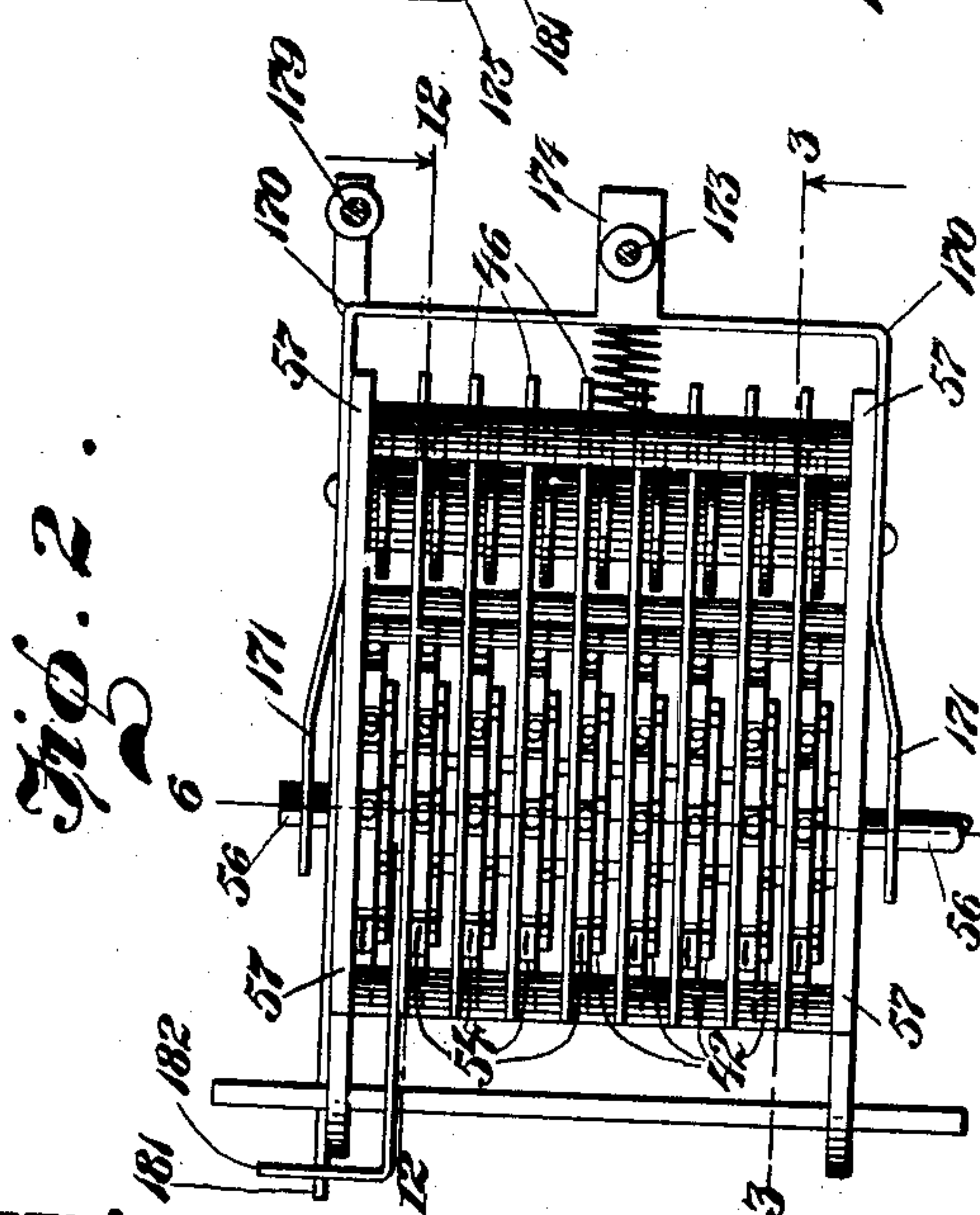
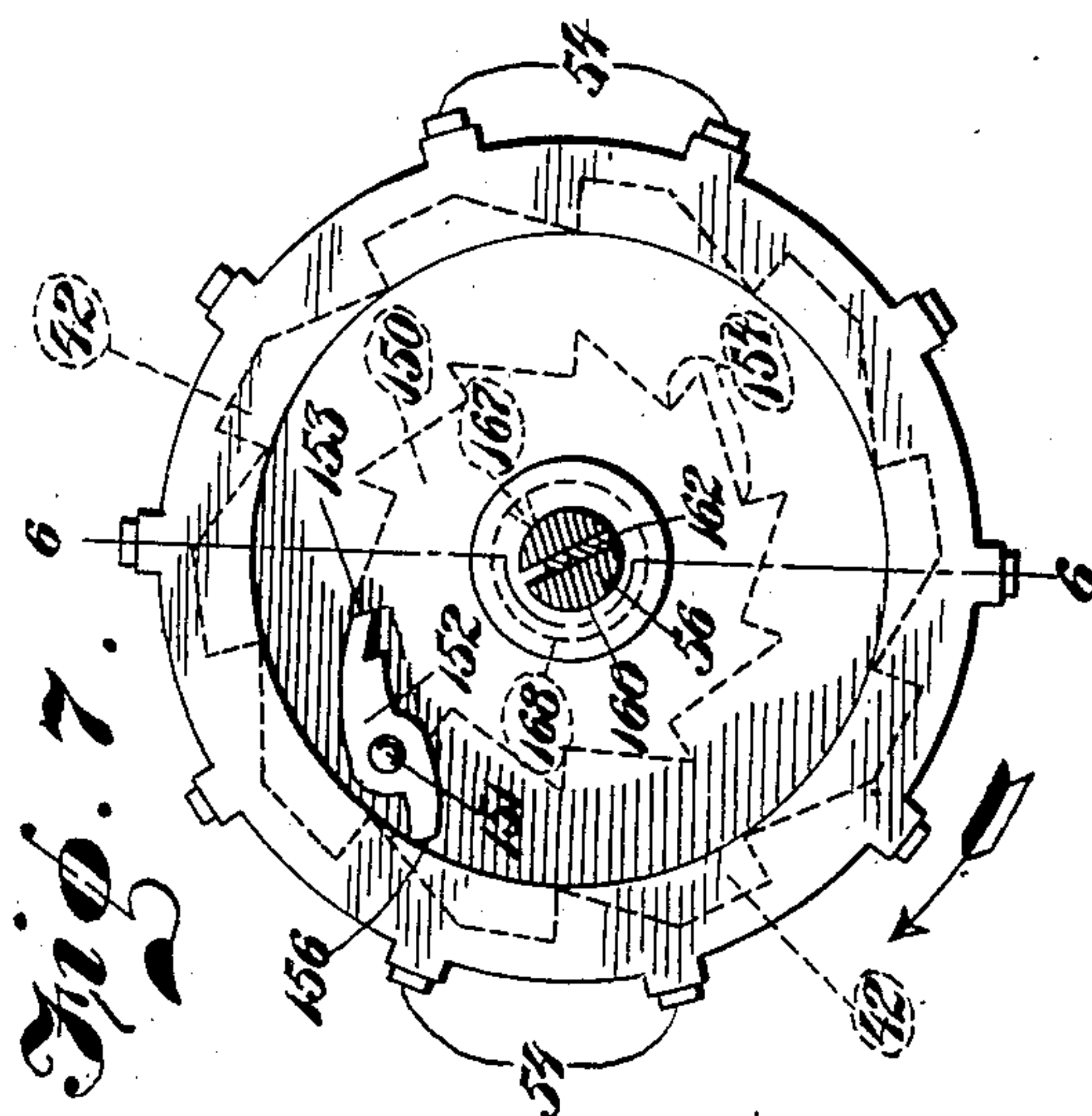
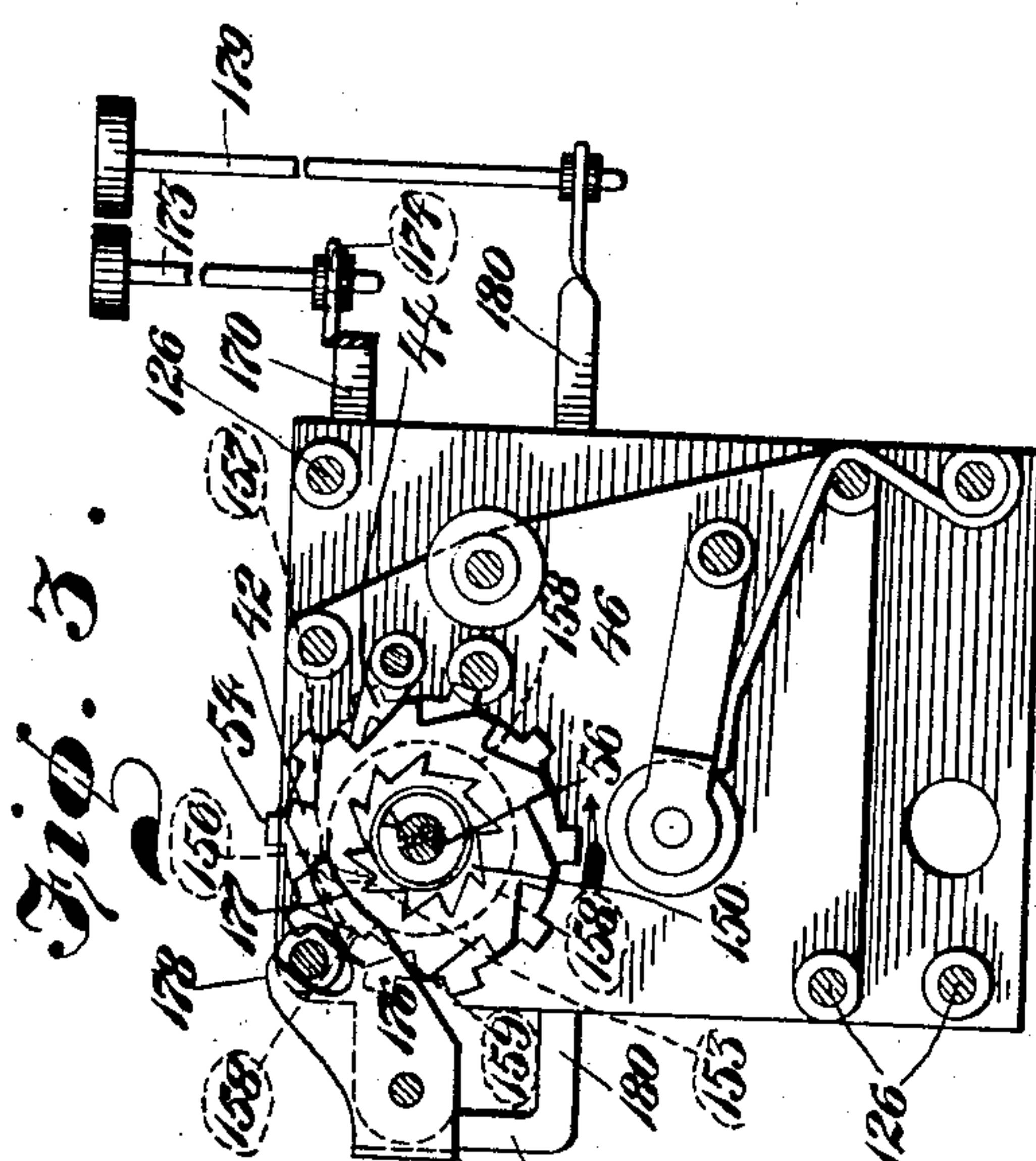
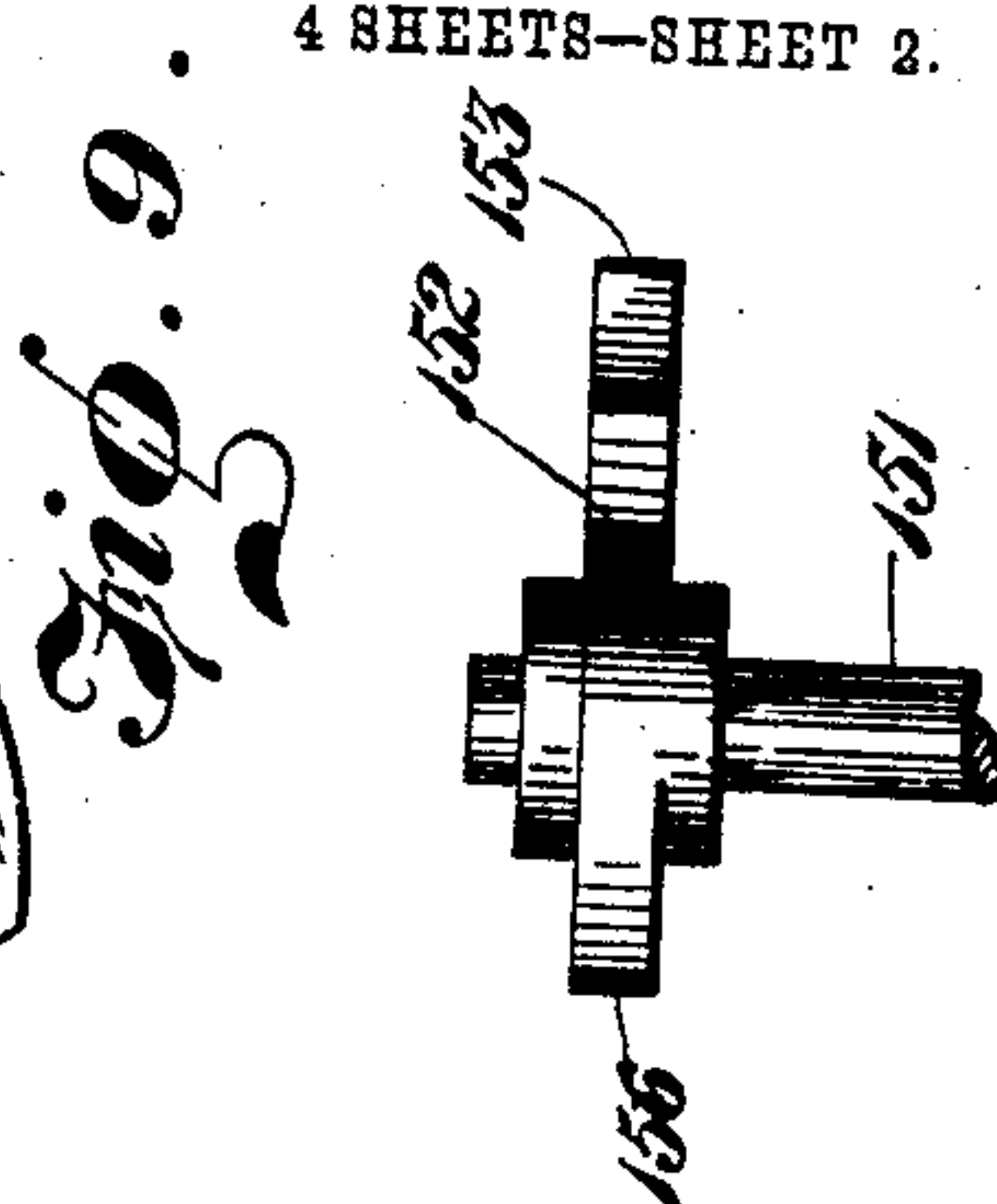
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924,256.

4 SHEETS—SHEET 2.



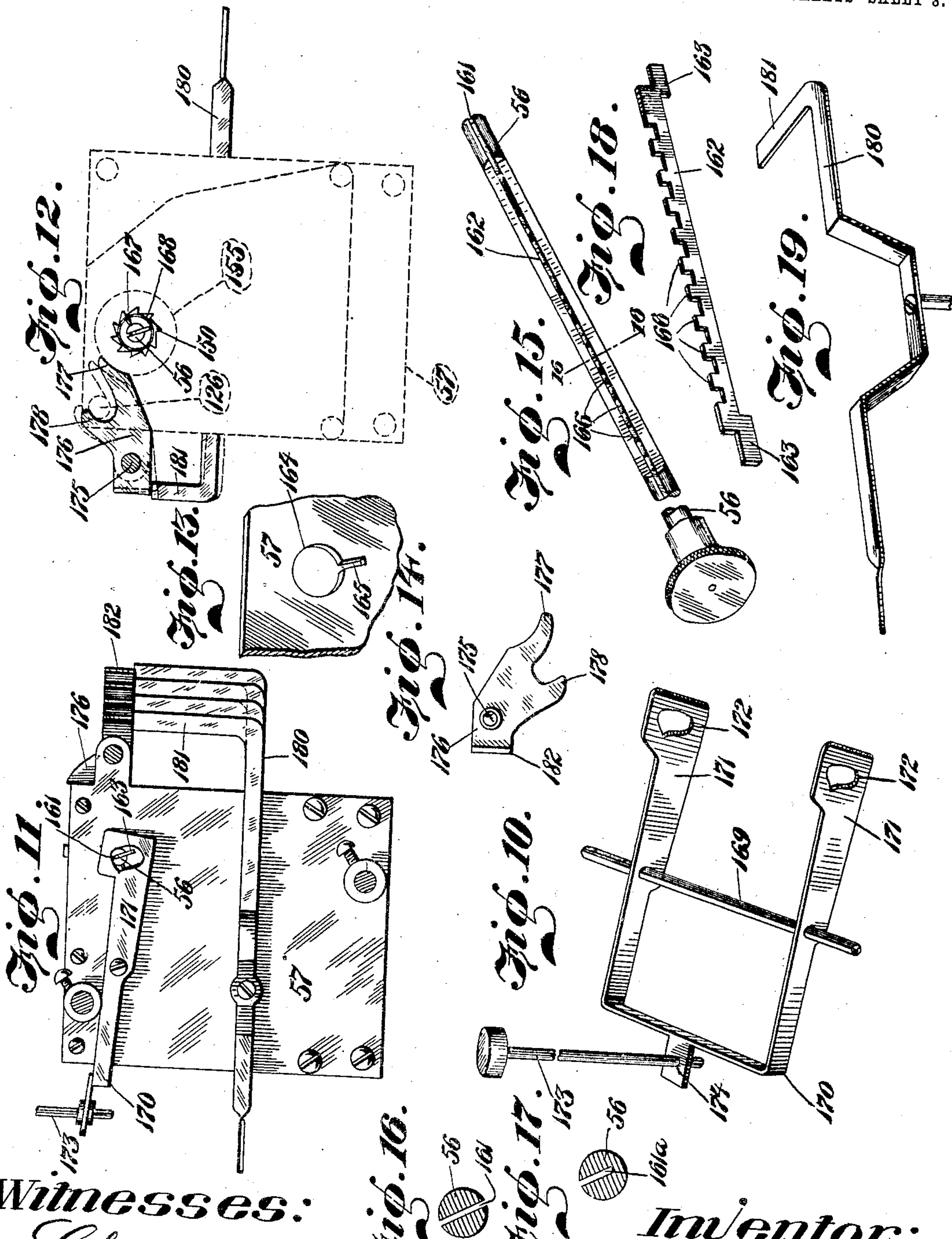
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CALCULATING MACHINE.
APPLICATION FILED SEPT. 18, 1907.

924,256.

Patented June 8, 1909.

4 SHEETS—SHEET 3.



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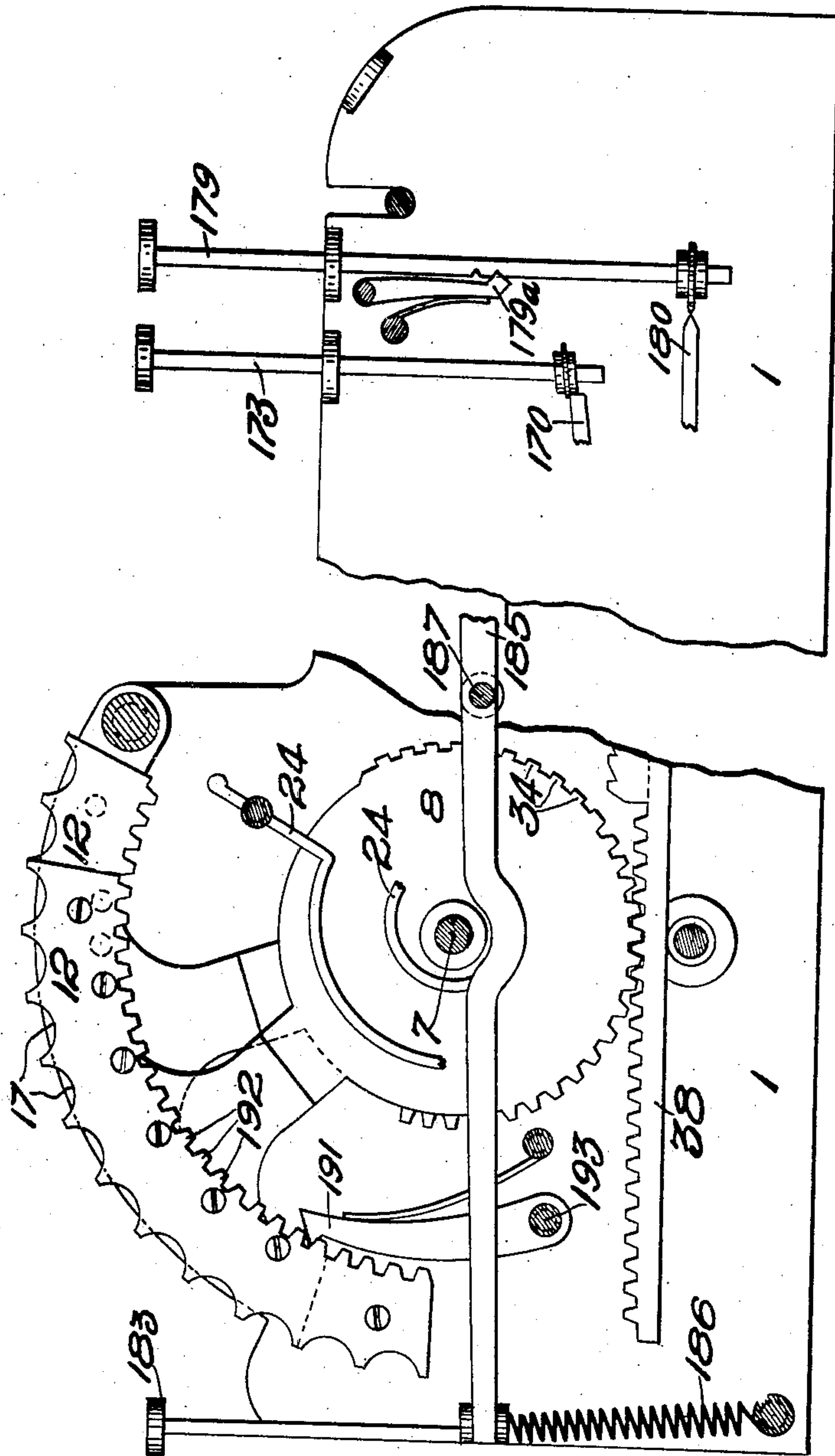
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 CALCULATING MACHINE.
 APPLICATION FILED SEPT. 18, 1907.

924,256.

Patented June 8, 1909.

4 SHEETS—SHEET 4.

Fig. 20.



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UNITED STATES PATENT OFFICE.

ALBERT J. MEIER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE DUPLEX ADDING MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CALCULATING-MACHINE.

No. 924,256.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed September 18, 1907. Serial No. 393,494.

To all whom it may concern:

Be it known that I, ALBERT J. MEIER, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for mechanically adding items or numbers into an aggregate or total, and embodies a number of improvements adapted to be used in the adding-machine invented by Adolphus G. Meier and described and shown in his pending application, Serial Number 330,278, filed August 13, 1906, but so far as the register or accumulating mechanism which forms part of the subject-matter of this application is concerned, the aforesaid machine is merely illustrative and these improvements may be applied to any other machine which will properly rotate the adding-wheels.

In the drawings, forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a longitudinal sectional view of the preferred form of the machine; Fig. 2 is a top plan view of the accumulating mechanism; Fig. 3 is a section on the line 3—3, Fig. 2; Fig. 4 is a side elevation and Fig. 5 is a top plan view of a partition plate; Fig. 6 is a view of two adjacent adding-wheels, partly in elevation, and partly in section on the line 6—6, Figs. 2 and 7; Fig. 7 is a side elevation of an adding-wheel, as same appears on the side opposite that exposed in Fig. 3; and on an enlarged scale as compared to that figure; Fig. 8 is a side elevation of one of the transfer pawls; Fig. 9 is a top plan view of one of these pawls and the pin upon which same is pivoted to its adding-wheel; Fig. 10 is a perspective view of the yoke which forms part of the zero-setting mechanism; Fig. 11 is a side elevation of the casing containing the accumulating mechanism; Fig. 12 is a section on the line 12—12, Fig. 2; Fig. 13 is a detailed view of part of a side plate; Fig. 14 is an elevation of one of the column-separating levers; Fig. 15 is a perspective view of the shaft on which the adding-wheels are journaled; Fig. 16 is a section on the line 16—16, Fig. 15; Fig. 17 is a section of a modified form of shaft, taken on the same line; Fig. 18 is a perspective view of the comb which forms part of the zero-setting

mechanism; Fig. 19 is a perspective view of one of the members by which the column-separating levers are moved; and Fig. 20 is a longitudinal sectional view of a modified form of the machine.

The aforesaid application of Adolphus G. Meier fully describes the construction and operation of the various parts of the adding-machine in connection with which the register or totalizer and other improvements forming the subject-matter of this application are herein shown as being used, and such of those parts as are herein mentioned are referred to only briefly. In each application the same reference numerals are used to designate parts which are common to the two machines, while parts peculiar to this invention and not shown in said former application are designated by reference numerals higher than any used in said other application.

Briefly to describe the general *modus operandi* of the machine, it may be said that the listing type 34 carried upon the peripheries of sectors 8 are raised to printing position (opposite ribbon 35) by depression of keys 12, which keys cause the sectors to rotate upon shaft 7. The sectors, when thus rotated, give a forward thrust to rack-bars 38, which, meshing with the ratchet-wheels secured to the adding-wheels 43, revolve said adding-wheels in the direction indicated by the arrows, Figs. 3 and 7, and cause the total-printing type 54 thereupon to be exposed to ribbon 55. After each item is set up by depression of the appropriate key or keys, said item is printed by moving platen 103 against type 34, and, when all the items to be added have been listed and printed, the total is taken by moving the platen against 54. So far as the carrying or transfer mechanism, by which each time an adding-wheel passes from "9" to "0" "one" is carried or transferred to the wheel next higher in the series (the one adjacent on the right, Fig. 6), said higher wheel being advanced one number, the zero-setting devices, or other features of invention relating to the accumulator or totalizer are concerned, however, the nature of the means for rotating the adding-wheels is immaterial.

The adding-wheels are mounted upon a shaft 56 supported by the side-plates 57, and between each adding-wheel and the one adjacent is a partition plate 46, which plates

are held upon rods 126 extending from one plate 57 to the other. To each adding-wheel is secured a ratchet-wheel 42, by means of which the proper rack-bar 38 rotates same, and each adding-wheel (except the one lowest in the series) carries, also, another ratchet-wheel 150, by means of which the transfer is accomplished. A pin 151 projects outwardly from each adding-wheel parallel to the axis thereof, upon which pin is pivoted a multiple-toothed pawl 152, and each time the adder is given that partial rotation which causes it to move from "9" to "0", thus signifying that said adder has accumulated ten units (or ten tens or ten hundreds, etc.) which must be properly carried or transferred to the next higher column, the end 153 of pawl 152 engages a tooth 154 of the ratchet 150 secured to the adding-wheel next higher in the series, thus causing the two wheels to rotate in unison, being lifted out of such engagement and stopping the rotation of said higher adding-wheel as soon as same has been advanced one number.

Each partition plate 46 has a perforation 155; and, when the parts are assembled, the pawl 152 and ratchet 150 are within this perforation, and the end 156 of pawl 152 rides against the edge of the perforation, the position of said pawl with reference to the ratchet 150 being controlled thereby. The outer curved edge of the notch 158 constitutes a segment of a circle concentric with the circle partially described by the edge of the remainder of perforation 155, and, during the time that end 156 of pawl 152 engages that part of the circumference lying in the circle of smaller radius (which part comprises approximately nine-tenths of its total circumference) end 153 of the pawl is kept clear of ratchet 150 and each adding-wheel rotates independently of its neighbor. When, however, end 156 rides over corner 157 and engages the segment 158 of the circle of larger radius, end 153 drops down, bears against a tooth 154, and the two wheels rotate in unison until such time as end 156 rides upon corner 159, by which it is lifted out of engagement with the ratchet, and the adders move independently, as before. The notch 158 is so located that the pawl 152 is permitted to engage ratchet 150 as the adder to which the pawl is secured passes from "9" to "0", and no longer, the pawl being lifted clear of the ratchet immediately after the adder to which the ratchet is secured has been advanced one number. While the notch 158 is preferably arcuate, it may be of any other shape which permits it to trip the pawl into and out of engagement with the ratchet at the proper time. In the drawings, both ratchets are shown as being upon the same side of the adding-wheel to which they are attached, but the adding-disk may,

if desired, be placed between the two ratchets, or the three members may be formed integrally, no particular construction being obligatory. The type-disks are usually molded of type-metal, while the ratchets and other operating parts are preferably stamped by dies from brass or iron, and the smaller ratchet may, conveniently, serve as the hub of the wheel, being perforated at 160 for reception of shaft 56. The adding-wheels shown herein are represented as bearing only ten type-characters, while in some machines it is desirable to have twenty, thirty, or some other multiple of ten characters, so as to permit the use of wheels of larger diameter than those depicted in the drawings of this application. In such cases, there must be as many notches 158 or as many pawls 152 as there are multiples of ten characters, so that every time an adding-wheel passes from "9" to "0", whether that partial rotation comes only once with each complete revolution of the wheel, or oftener, the ten units (or tens or hundreds, etc.) will be transferred from that adding-wheel which has accumulated same to the one next higher in the series. If the adding-wheel carries 100 characters, as in some machines, the transfer may be made only as the wheel passes from "99" to "100," or at such other points as may be desirable. Other changes in details of construction may be made without departing from the spirit of the invention.

The shaft 56 serves both as an axis on which to journal the adding-wheels 43, and, at the same time, forms part of the zero-setting mechanism, by which all the adding-wheels are returned to "0" after the total has been taken, and the machine thereby cleared so that the calculating operation can begin anew. Said shaft is slotted at 161 for the greater portion of its length, and in this slot a comb 162 is carried, said comb having an ear or offset 163 at each end, the width of the comb at its ends being approximately equal to the diameter of the shaft. Shaft 56 is revolvably journaled in perforations 164 in the side-plates 57, and extending from each of said perforations is a slot 165, into which slots ears 163 drop by gravity or are forced by a spring when the shaft 56 is turned to the proper position, and thus said shaft is locked against rotation. When said ears are in said slots, the teeth 166 of the comb are within the slot 161, but when the comb is moved so that the ears 163 are lifted out of the slots 165, the teeth 166 protrude beyond the periphery of the shaft and engage the pins 167 which project from the adding-wheels, one such pin being fastened to each adding-wheel at a less distance from the center of the shaft 56 than the distance from the shaft-center to the outermost point assumed by the teeth 166. Said teeth are spaced apart from each other a

sufficient distance so that the teeth will not strike the hubs of the adding-wheels and thus prevent proper movement of the comb.

The hubs are hollowed out at 168, and it is into these hollows that the comb projects. Since the width of the toothed part of the comb is less than the diameter of the shaft 56, said shaft, instead of having the single slot 161 may be provided with a groove 161^a deep enough to receive the body of the comb and a small slot at each end, through which slots ears 163 pass.

To a pintle 169 which passes from one side plate 57 to the other, or on any other convenient support, a yoke 170 is pivoted, the ends of the arms 171 of which yoke are perforated at 172, which perforations encircle the shaft 56 and the ends of comb 162. Depression of key 173 which projects upwardly through the outer casing, being suitably connected at 174 to the yoke, rocks said yoke, elevates the perforated ends thereof, and causes the yoke to lift the ears 163 of comb 162 out of the slots 165, thereby leaving the shaft 56 free to revolve, at the same time raising the teeth 166 out of slot 161 or the groove 161^a in the shaft 56, if that modification be used. After the adding operation has been completed, pins 167 will be variously positioned around the shaft, the position of each pin depending on the distance that the particular adding-wheel carrying same has been advanced. If the shaft 56 be revolved while teeth 166 project outwardly from the shaft and into cavities 168, each of said teeth will engage the corresponding pin wherever it may be, and each adding-wheel "picked up" and returned to "0" as the shaft continues to revolve. When the shaft has made a complete revolution the ears 163 will drop by gravity into slots 165, thus locking the shaft against further movement, and signifying to the operator that the machine has been cleared. After the key 173 has been depressed, and while it is held in the depressed position (the ears 163 being thus held out of slot 165, leaving the shaft 56 free to revolve), the operator turns the shaft, and, as he does so, each of the teeth 166 of the comb 162 will cause the proper adding-wheel to rotate in unison with the shaft until the wheel is carried to "0". The shaft having been turned a short distance, enough to carry the ears 163 beyond the slot 165, the key 173 is released, and the yoke 170 allowed to return to normal position before the revolution of the shaft 56 has been completed; hence, the yoke 170 will not interfere with the dropping of comb 162 into slots 165 when the adding-wheels all stand at "0". If desired, however, a spring-controlled pawl (not shown) can be provided to secure and retain the yoke 170 in an elevated position and thus keep ears 163 out of slot 165, which pawl can

be released automatically or otherwise and the yoke 170 allowed to return to normal position before the adding-wheels are cleared.

Most machines of this character have a capacity for adding up to 999,999,999, but it is only on very rare occasions that columns of over six figures are added, and usually four or five figures will suffice. The mechanism presently to be described enables the operator to dispense with the transfer of accumulated units (tens or hundreds, etc.) from any column to the column next higher in the series which normally occurs each time the adding-wheel of the lower column completes a revolution or passes from "9" to "0", and in this way the machine can be used for adding two or more entirely independent lists of items. For example, if the tens of thousands column is not carried or transferred to the hundreds of thousands column, the keys and wheels for units, tens, hundreds, thousands, and tens of thousands list and add one list of items, each of which comprises not more than five figures, while the hundreds of thousands, millions, tens of millions, and hundreds of millions wheels, etc., are, respectively, units, tens, hundreds, and thousands wheels for a list of items entirely different from that added by the other series of wheels. Thus the operator can list gross, tare, and net weights on the same line, and yet take the total of each column, this being only one example of what can be done on this improved machine. On a shaft 175 which extends from one plate 57 to the other levers 176 are fulcrumed, each of which levers terminates in a curved foot 177. When any lever 176 is moved to the position shown in full lines in Fig. 3, the foot 177, which slides closely adjacent a partition plate 46, descends, covers over the notch 158, and thus, in effect, converts perforation 155 into a perfect circle. If the adjacent adding-wheel should pass from "9" to "0" while foot 177 thus covers over notch 158, end 156 of the pawl 152 carried on said wheel merely rides upon foot 177, which foot prevents the pawl from sinking into the notch, keeps the pawl from locking with ratchet 150, and, of course, inhibits the carrying or transfer of the ten units (tens or hundreds, etc.) which have been accumulated on that adding-wheel bearing the pawl to the wheel next higher in the series. There are as many levers 176 in the machine as there are partition plates 46 (though in Fig. 3 only one such lever is shown), so that the operation of any one of the pawls 152, and, consequently, the transfer from any column to the one higher, is suspended whenever and just as long as desired. Each lever 176 is provided with a tooth 178 which engages a cross-rod 126 to keep the lever from moving too far, and is rocked by depression of one of the keys 179 which keys move levers 180 journaled to the side plates

57 (there being several levers 180 carried on each side plate, the total number each of levers 180, levers 176, and keys 179 being one less than the number of adding-wheels), the upturned ends 181 of said levers 180 bearing against extensions 182 on levers 176, so that by depression of the appropriate key or keys 179, the transfer of units (or tens or hundreds, etc.) accumulated in any column to the column higher in the series is prevented. The stem of the key 179 is notched in two places, and the end of the spring-pressed pawl 179^a is adapted to seat in one or the other of said notches, and, in this manner, to lock the key 179 against movement after said key has been moved either to that position where the foot 177 is held either clear of the transfer pawl or to that position where the foot prevents the transfer.

For the purpose of rocking the platen 103 into engagement with the type on sectors 8 and adding-wheels 43, keys 183 and 184 and a lever 185 are provided, and, to lock the keys 183 in place after they have been depressed, either dogs 188 which seat in sockets 17 or pawls 191 which cooperate with the teeth 192 of rack-bar 190 are provided, the construction and operation of all parts mentioned in this paragraph being fully described and claimed in my divisional application, Serial No. 415,507.

The operation of the device may briefly be summarized as follows: The adding wheels are rotated or partly so, by the act of the operator in depressing the key or keys which register the items to be added, the extent of rotation of each wheel being governed by the distance the key controlling same is depressed. Each such partial rotation causes the adding-wheel to add the digit registered by the key, and, at each time that such wheel passes from "9" to "0", showing that 10 units (or tens or hundreds, etc.) have been accumulated, the pawl 152 engages the ratchet 150 attached to the adder next higher in the series, and advances same one number. After each item has been registered, the item is printed by the act of the operator in depressing the key 183 which rocks the platen 103 and causes same to strike the type 34 on the sectors 8. The sum of the items is printed when all the items have been added, by depressing the key 184 which rocks the platen into engagement with the adding-wheels 43. When this has been done the machine is cleared (or the adding-wheels all returned to "0") by rotating the shaft 56 after the comb 162 has been lifted out of the slots 165 by depression of the key 173, and, when the adders are all brought to "0", comb 162 will again drop into slots 165 and lock the shaft against rotation, so that the adding-operation can be commenced anew. At any time when it is desired to prevent the transfer of accumulated units from one column to another,

depression of the appropriate key 179 secures that result, by throwing the lever 176 into such position that it keeps the pawl 152 from locking with the ratchet 150.

Some of the appended claims state that there is a pawl and a ratchet on each side of each adding-wheel, and this statement has been made to avoid unnecessary prolixity in defining the invention. It should be noticed, however, that the lowest adding-wheel of the series requires no ratchet 150 and the highest wheel of the series has no pawl 152, and the claims should be construed accordingly.

Having thus described my said invention, what I claim and desire to secure by Letters-Patent is:

1. A calculating-machine comprising a plurality of adding-wheels each having a transfer pawl on one side and a ratchet on the other, each pawl serving predeterminedly to engage and rotate the ratchet of the wheel adjacent, one end of each pawl being multiple-toothed.

2. A calculating machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, and a comb-like member normally retained within the recess but being adapted to project therefrom, by the teeth of which member, at the time said teeth project beyond the shaft, said wheels are returned to "0".

3. A calculating-machine having a plurality of adding-wheels, a member projecting from each of same, a recessed shaft, and a toothed member normally retained within said recess but being adapted to project therefrom, the teeth of said member being adapted, when projecting beyond the shaft, to engage said projecting members and return the wheels to "0".

4. A calculating-machine having a plurality of adding-wheels, a member projecting from each of same, a recessed shaft, and a toothed member normally retained within the recess but being adapted to project therefrom, the shaft being greater in diameter than the width of said member, the teeth of said member, when projecting beyond said shaft, being adapted to return said adding-wheels to "0".

5. A calculating machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, an integral means normally retained within the recess by which means all of said wheels are returned to "0", and means predeterminedly to cause said afore-mentioned means to extend beyond said recess, said means, when thus extending, being adapted to engage all of said wheels.

6. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a toothed member normally retained within the recess by which

member said wheels are returned to "0", and means predeterminedly to cause the teeth of said toothed member to extend beyond said recess.

5 7. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, an integral means normally retained within said recess by which means all of said adding-wheels are
10 returned to "0", and means for holding said aforementioned means without said recess for a predetermined length of time, said means being then adapted to engage all of said wheels.

15 8. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a comb-like member normally retained within said recess, and a recess in the casing to receive the end of
20 said comb, thereby to lock the shaft against rotation.

9. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a comb-like member normally retained within said recess, a
25 recess in the casing to receive the end of said comb, and means to move said comb-end out of said recess, thereby to move said comb out of the recess in said shaft.

30 10. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a comb-like member normally retained within said recess, an ear upon the end of said comb, and a recess
35 in the casing to receive said ear, thereby to permit said comb to be withdrawn within said shaft-recess.

11. A calculating-machine having a plurality of adding-wheels, a recessed shaft on
40 which same are journaled, a comb-like member normally retained within said recess, an ear upon the end of said comb, a recess in the casing to receive said ear, and means to move said ear out of said recess, thereby to move
45 said comb out of the recess in said shaft.

12. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, means normally
50 retained within the recess by which means said wheels are returned to "0", and a yoke engaging said means to move same out of said recess into operating position.

13. A calculating-machine having a plurality of adding-wheels, a recessed shaft on
55 which same are journaled, a comb-like member normally retained within said recess, and a yoke engaging said member and adapted to move the teeth thereof into operating position.

60 14. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a comb-like member normally retained within said recess, a member projecting from each adding-wheel,
65 and a yoke which engages said comb-like

member and is adapted to move said teeth to a point where they engage said projecting members.

15. A calculating-machine having a plurality of adding-wheels, a shaft on which
70 same are journaled, a cavity in each adding-wheel, a member projecting from each wheel into the cavity thereof, and means which predeterminedly project into said cavities to engage said members, thereby to rotate said
75 wheels.

16. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a slot extending
80 from the journal for said shaft, means normally retained within said recess and said slot, and a yoke with a perforated arm, which perforation surrounds said means and said shaft, and moves said means out of said recess and said slot. 85

17. A calculating-machine having a plurality of adding-wheels, a recessed shaft on which same are journaled, a member normally retained in said recess by which member
90 said wheels are rotated, a slot in the shaft through which said member end projects, and means to move said member end from said slot, thereby to move said member into operative position.

18. A calculating-machine having a plurality of adding-wheels, a recessed shaft on
95 which same are journaled, a member normally retained in said recess, by which member said wheels are rotated, and a yoke encircling said shaft and said member end, said yoke being adapted to move said member
100 into operative position.

19. A calculating-machine having a plurality of adding-wheels, a ratchet on one side of
105 each adding-wheel and a pawl on the other, a perforated plate disposed between adjacent wheels, one end of each pawl bearing against the edge of the perforation in the corresponding plate, said perforation having a notch
110 into which said pawl-end rides, thereby to rock said pawl, and means for covering said notch, thereby to suspend the rocking of said pawl.

20. A calculating-machine having a plurality of adding-wheels, a ratchet on one side of
115 each adding-wheel and a pawl on the other, a perforated plate disposed between adjacent wheels, one end of each pawl bearing against the edge of the perforation in the corresponding plate, said perforation being approxi-
120 mately circular but having a notch into which said pawl-end rides, thereby to rock said pawl, and means covering over said notch so as to prevent a practically unbroken circular edge to said pawl-end, thereby to suspend
125 rocking of said pawl.

21. A calculating-machine having a plurality of adding-wheels, a ratchet on one side of
130 each adding-wheel and a pawl on the other, a perforated plate disposed between adjacent

wheels, one end of each pawl bearing against the edge of the perforation in the corresponding plate, said perforation being approximately circular but having a notch into which said pawl-end rides, and a lever with a curved foot adapted to cover over said notch so as to present a practically unbroken circular edge to said pawl-end, thereby to suspend rocking of said pawl.

22. A calculating-machine having a plurality of adding-wheels, a ratchet on one side of each adding-wheel and a pawl on the other, a perforated plate disposed between adjacent wheels, one end of each pawl bearing against the edge of the perforation in the corresponding plate, said perforation being approximately circular but having a notch into which said pawl-end rides, thereby to rock said pawl, and a foot adapted to be disposed in the path of travel of said pawl-end, thereby to prevent rocking of said pawl.

23. A calculating-machine having a plurality of adding-wheels, a ratchet on one side of each adding-wheel and a pawl on the other, a perforated plate disposed between adjacent wheels, one end of each pawl bearing against the edge of the perforation in the corresponding plate, said perforation being approximately circular but having a notch into which said pawl-end rides, thereby to rock said pawl, and means exterior to said perforation over which said pawl-end may ride when passing said notch, thereby to prevent rocking of said pawl.

24. A calculating-machine having a plurality of adding-wheels, means for transferring the numbers accumulated on any wheel to the wheel next higher in the series, and means for suspending the operation of such transferring means, said last-mentioned means comprising a member which is inserted between the wheels, an extension on said member, and a lever fulcrumed on the side-plate and engaging said extension, and means to rock said lever.

25. A calculating-machine having a plurality of adding-wheels, means pivoted upon each wheel for transferring the numbers accumulated on that wheel to the wheel next in the series, and means for suspending the operation of such transferring means, said last-mentioned means comprising a member which is inserted between said wheels to a point where it engages the transferring means, thereby to prevent the transferring movement thereof.

26. A calculating-machine comprising a plurality of adding wheels, a ratchet on one side of each adding wheel and a transfer pawl on the other, and a movable foot adapted to be interposed between each wheel and the one adjacent to a point where it engages the transfer pawl and prevents the transferring movement thereof.

27. A calculating-machine having a plu-

ality of adding-wheels, a ratchet on one side of each adding-wheel and a transfer pawl on the other, a perforated plate between adjacent wheels, one end of each transfer pawl bearing against the edge of the perforation in the corresponding plate, said perforation having a notch into which said pawl-end rides, thereby permitting said pawl to move, and means to suspend the transferring operation between a given pair of wheels while leaving unaffected the transferring operation between the other pairs of wheels.

28. A calculating-machine provided with a plurality of adding-wheels, a revoluble shaft on which same are journaled, a member projecting from the hub of each adding-wheel, a member which extends from end to end of the row of said adding-wheels, and means which cause said last-mentioned member to move to a point where it will engage each of said first-mentioned members when said shaft is revolved.

29. A calculating-machine provided with a plurality of adding-wheels, a revoluble recessed shaft upon which said wheels are journaled, a member bearing a plurality of teeth, which member is normally retained within said recess, being movable toward or away from the axis of said shaft, and means for rotating said shaft, thereby to carry each tooth of said member into engagement with one of said adding-wheels and return the adding-wheel to "0".

30. A calculating-machine provided with a plurality of adding-wheels, a revoluble recessed shaft upon which said wheels are journaled, a member bearing a plurality of teeth, which member is normally retained within said recess, movable means engaging one end of said member, said means being adapted to move said toothed member out of said recess and means for rotating said shaft, thereby to carry each tooth of said member into engagement with one of said adding-wheels and return said adding-wheel to "0".

31. In a calculating machine, the combination of a plurality of adding-wheels, a pawl carried on each wheel for transferring the numbers from that wheel on which any pawl is carried to the wheel next in the series, and key-controlled means for suspending the operation of any transfer pawl.

32. In a calculating machine, the combination of a plurality of adding-wheels, a pawl carried on each wheel for transferring the numbers from that wheel on which any pawl is carried to the wheel next in the series, and a lever for suspending the operation of any transfer pawl.

33. In a calculating machine, the combination of a plurality of adding-wheels, a pawl carried on each wheel for transferring the numbers from that wheel on which any pawl is carried to the wheel next in the series, and means for suspending the operation of

any transfer pawl while leaving unaffected the operation of the other pawls.

34. A calculating machine provided with a plurality of adding-wheels, a movable member carried on each wheel predeterminedly transferring the numbers from that wheel to the wheel adjacent, and means for suspending the transferring movement of any desired one of said movable members while leaving unaffected the transferring operation between the other pairs of wheels.

35. A calculating machine provided with a plurality of adding-wheels, a movable member pivoted upon each wheel for transferring the numbers accumulated on that wheel to the wheel adjacent, and pivoted means for suspending the operation of said transferring means.

36. A calculating machine provided with a plurality of adding-wheels, a movable member pivoted upon each wheel for transferring the numbers accumulated on that wheel to the wheel adjacent, and a depressible key for controlling each of said transfer-suspending members.

37. A calculating machine provided with

a plurality of adding-wheels, a movable member pivoted upon each wheel for transferring the numbers accumulated on that wheel to the wheel adjacent, and a plurality of members each adapted to be inserted between two adjacent wheels to prevent the transferring movement of said first-mentioned members, each of said transfer-suspending means being controlled independently of the others.

38. A calculating machine provided with a plurality of adding-wheels, a movable member pivoted upon each wheel for transferring the numbers accumulated on that wheel to the wheel adjacent, and a plurality of members each adapted to be inserted between two adjacent wheels to prevent the transferring movement of said first-mentioned members, and a separate key to control each of said transfer-suspending means.

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

ALBERT J. MEIER.

Witnesses:

ELLIOTT R. GOLDSMITH,
GLADYS WALTON.