

No. 842,682.

PATENTED JAN. 29, 1907.

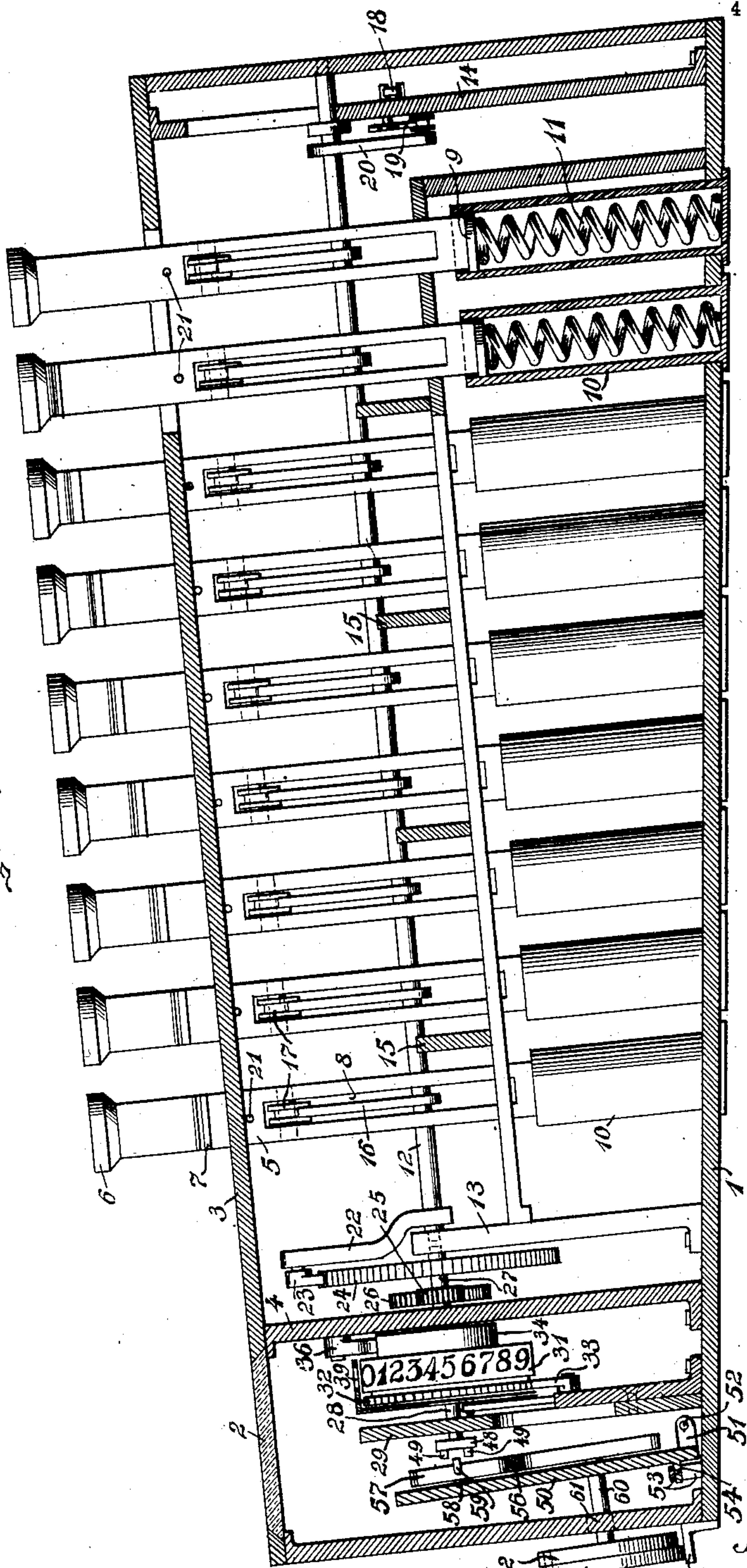
J. F. MAYS.

REGISTERING MECHANISM FOR CALCULATING MACHINES.

APPLICATION FILED MAY 24, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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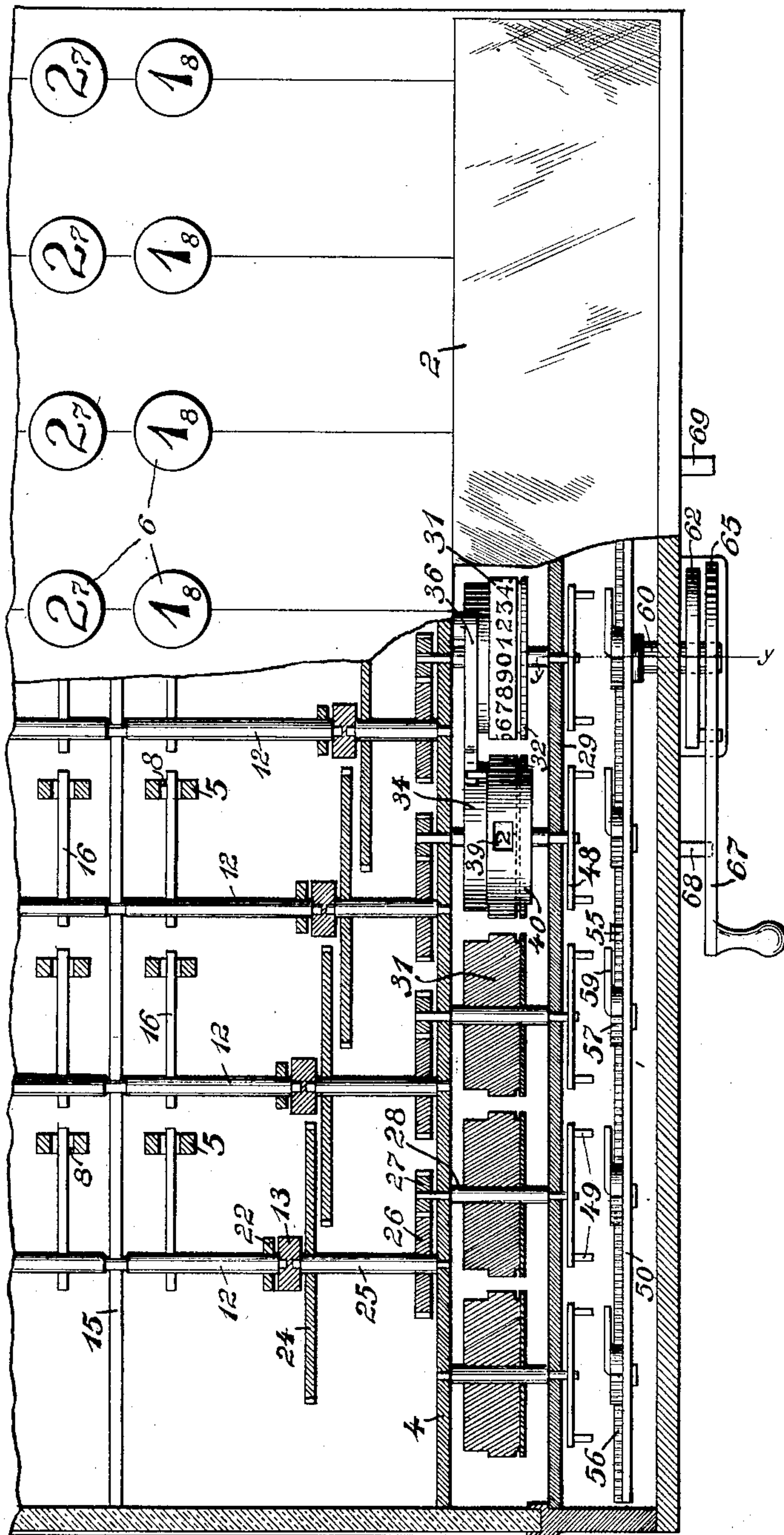
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4 SHEETS—SHEET 2.

Fig. 2.



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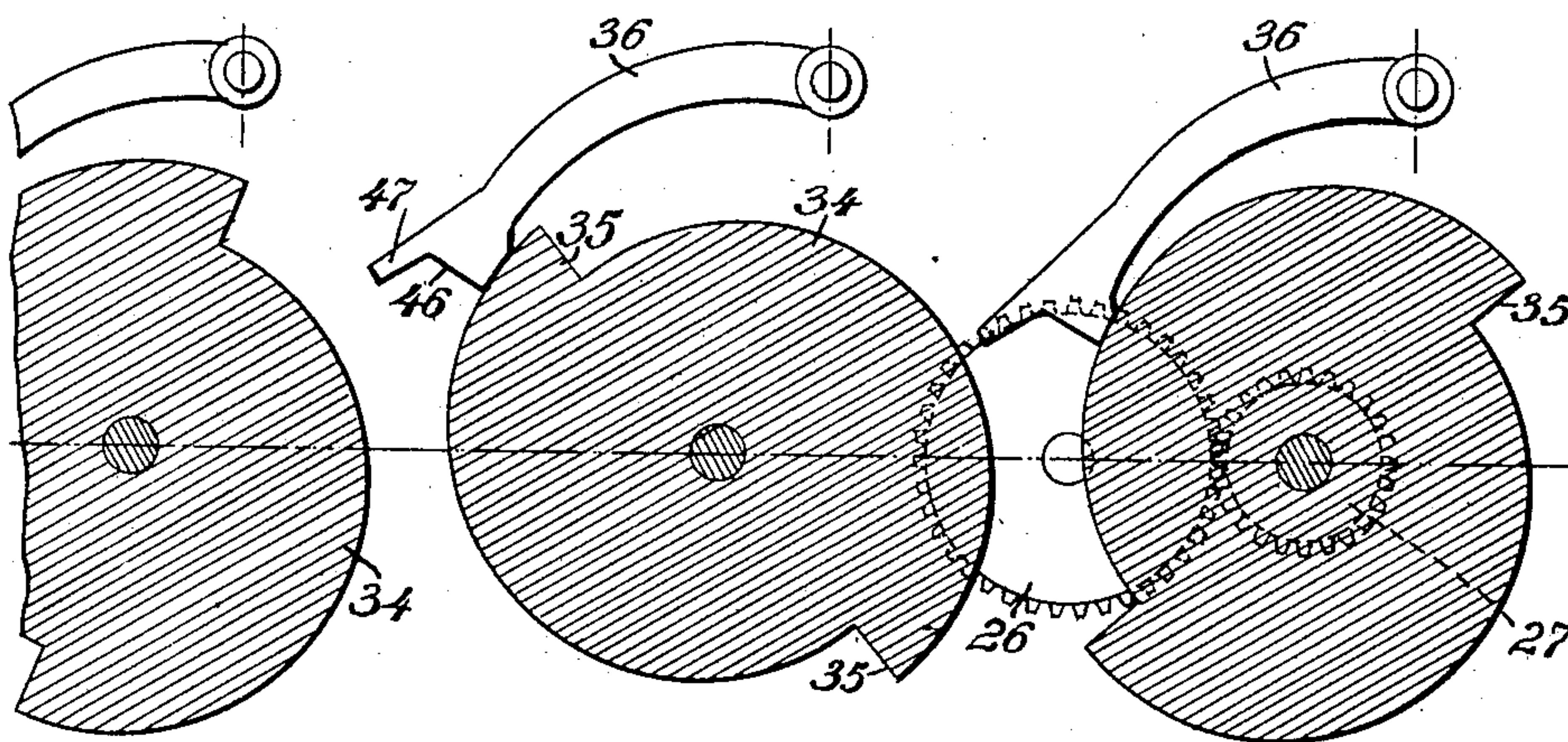
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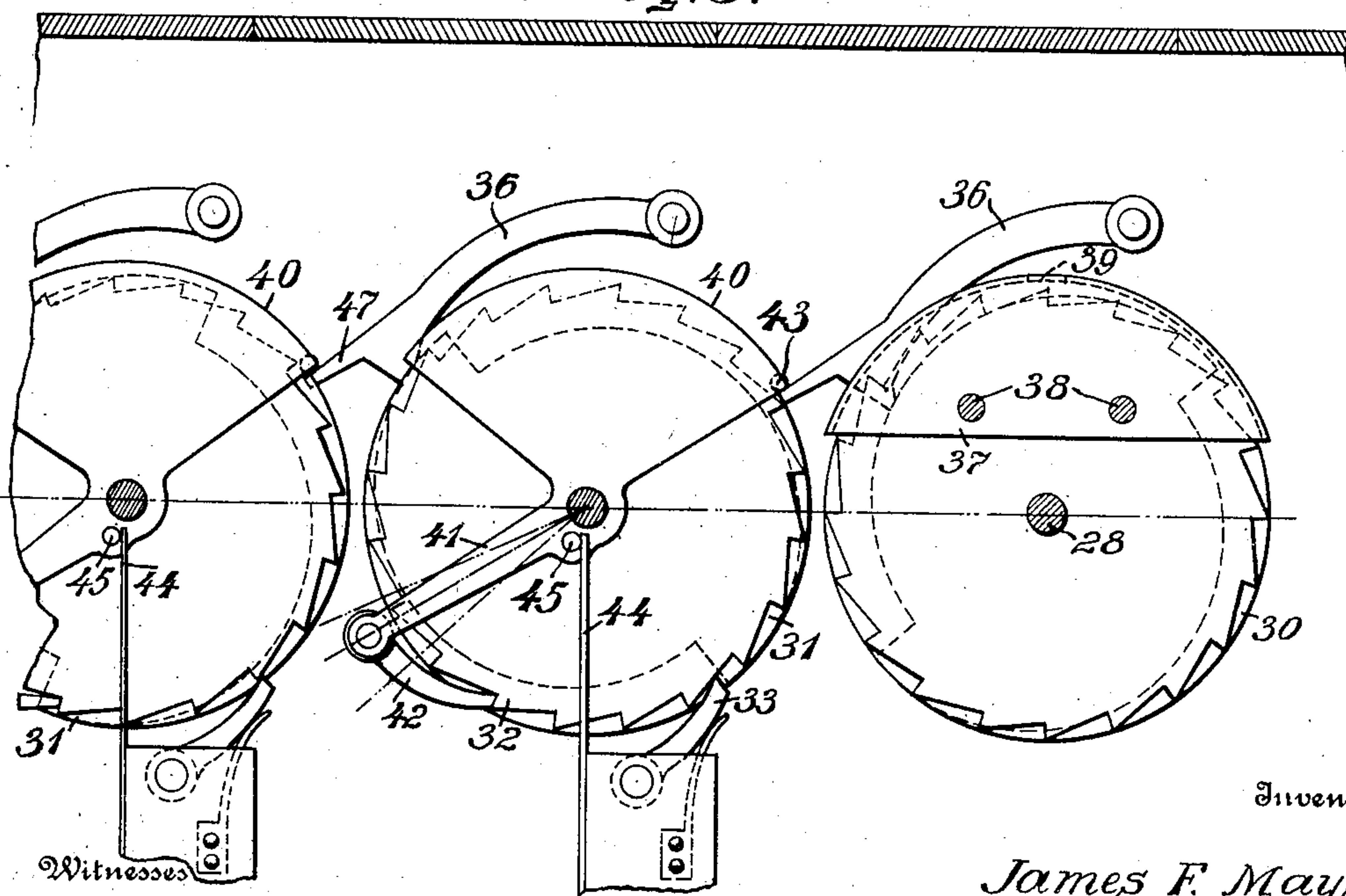
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4 SHEETS—SHEET 3.

*Fig. 4.*



*Fig. 3.*



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4 SHEETS—SHEET 4.

Fig. 5.

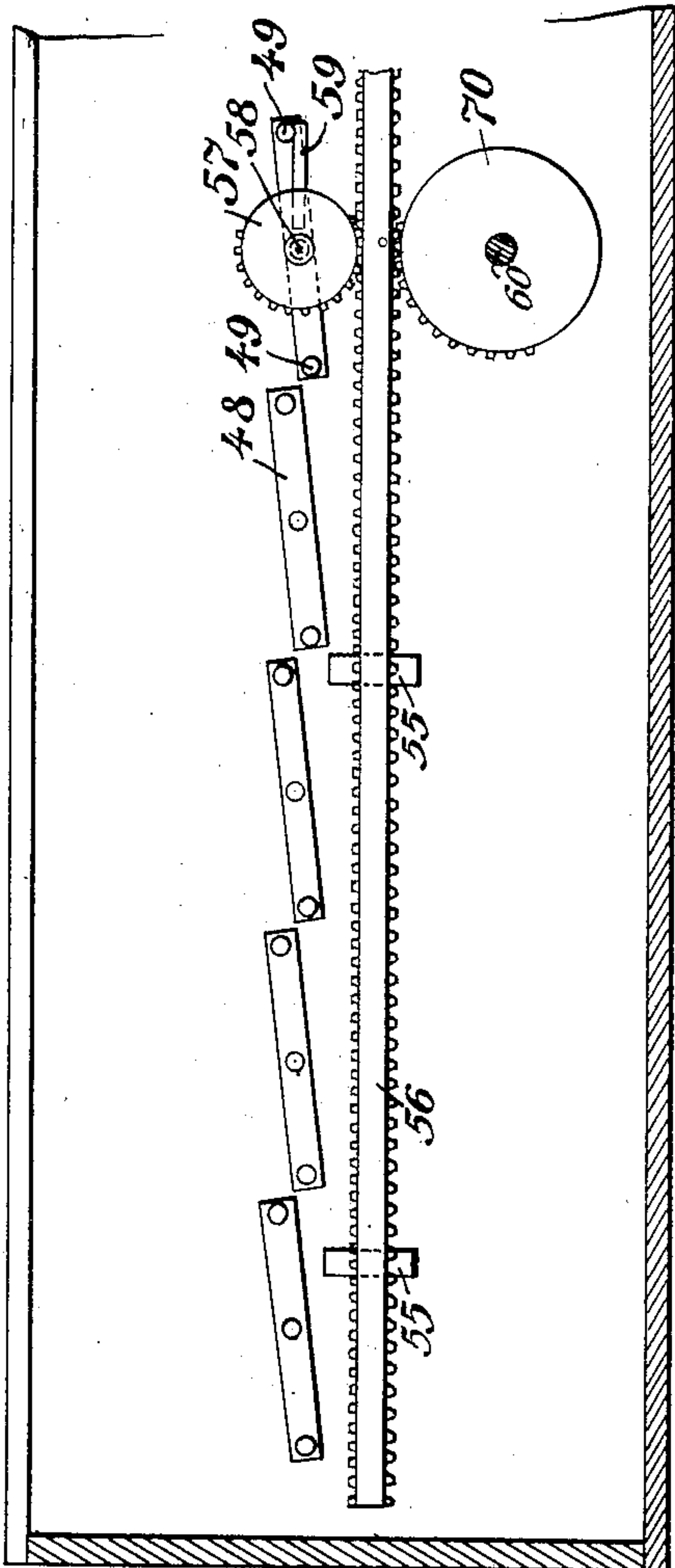


Fig. 6.

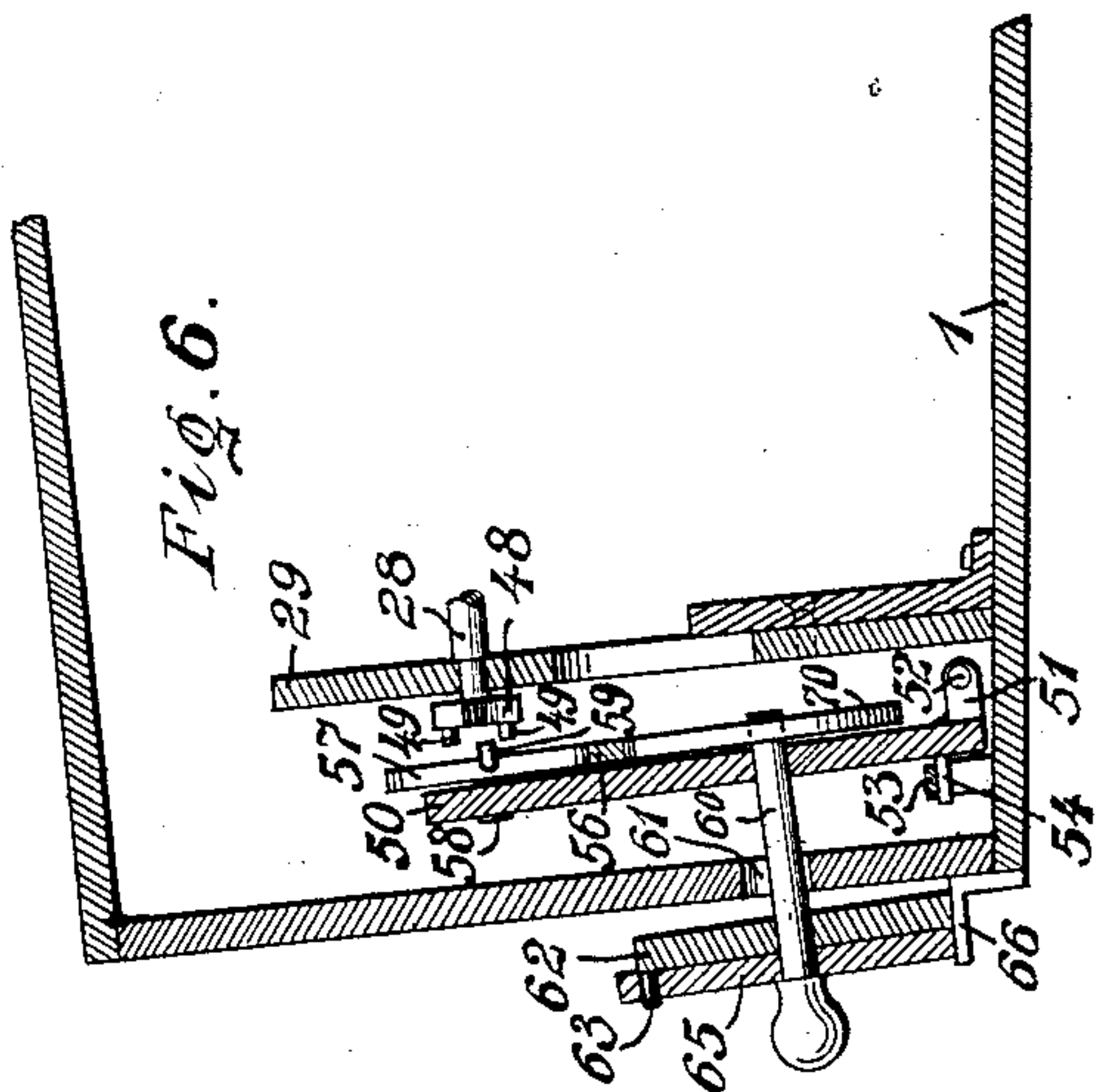
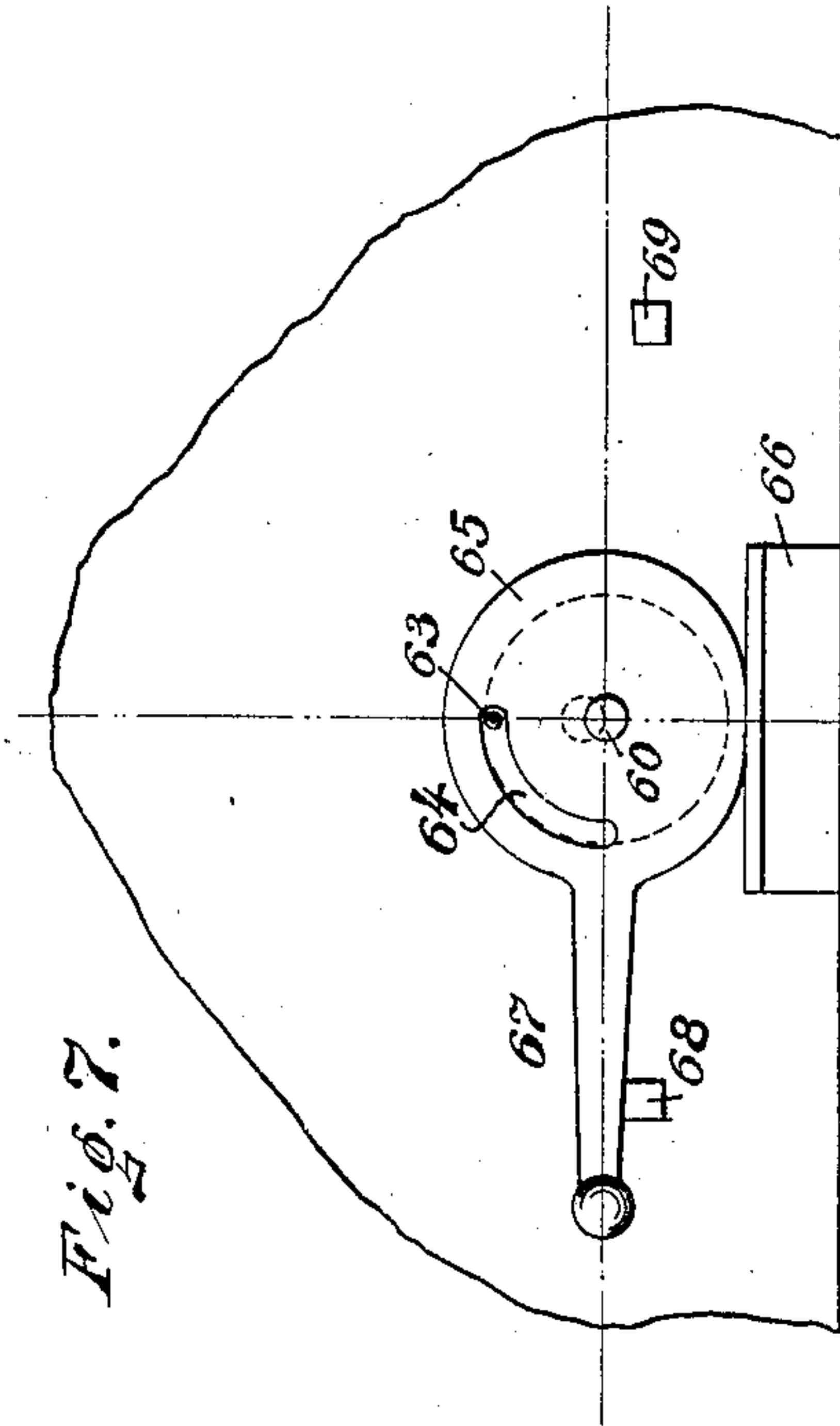


Fig. 7.



Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES F. MAYS, OF BIRMINGHAM, ALABAMA.

## REGISTERING MECHANISM FOR CALCULATING-MACHINES.

No. 842,682.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed May 24, 1905. Serial No. 262,031.

*To all whom it may concern:*

Be it known that I, JAMES F. MAYS, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Registering Mechanism for Calculating-Machines, of which the following is a specification.

My invention relates to registering mechanism for calculating or similar machines, such as I have described in a pending application, Serial No. 217,851, filed by me the 23d day of July, 1904, wherein a plurality of rock-shafts are directly operated by rows of keys and registering-dials are operatively connected to the shafts and moved thereby in correspondence with the movements imparted to the shafts by the keys, each key acting to rock its respective shaft in proportion to its value. In machines of this character the uniformity of key resistance to the touch of the operator is most important for rapid operation, which I consider of prime importance.

In my pending application I have shown various devices for maintaining the key resistance in moving the shafts to different degrees substantially uniform, and with this object in view I have adapted the registering mechanism constituting my present invention and a division of my said pending application to perform its carrying or transferring from dial to dial in a gradual manner, so that the key resistance will not be increased as a shaft is rocked to move its dial from "9" to "0" and carry "1" to the dial of higher degree. Where this gradual carrying or transferring action obtains, it is important to provide against confusion in reading the totals on the several dials which would arise from the tendency of the carrying operation to move the dials of higher degree almost a complete registering step before the actual point of registry is reached, thus moving their indicated numeral partly out of the field of vision and bringing the succeeding numeral of higher value partly into the field. This is particularly objectionable in calculating-machines, where every precaution should be taken against possibility of mistake by the operator in reading the registered items or totals. To obviate this, I provide each dial upon which the carrying operation takes effect with a movable shield or plate which has a sight-opening through which one of the numerals on the dial is visible and is adapted to

move with its respective dial during the gradual carrying operation, so as to maintain only the proper indicating-numeral in view until the point of registry for the carrying operation is reached, when the plate shifts its position, irrespective of its dial, to expose through its sight-opening a numeral of higher degree. Thus though the carrying operation is gradual so far as the operating mechanism is concerned it is practically instantaneous so far as it concerns the indicating or totaling.

It is a further object of my invention to adapt these dial-shields to serve as a portion of the transfer mechanism, means being provided to impart to them the gradual carrying movement from the dial of lower degree, which each shield in turn imparts to its respective dial, until the point of registry is reached, when the shield releases the dial and returns to its initial position, the dial remaining stationary.

A still further object of the invention is to provide a novel form of resetting mechanism by which all of the registering or totaling dials may be quickly reset to zero position, and, further, to so arrange the mechanism that the use of the resetting device is optional with the user, it being possible to restore and quickly reset the dials to a zero position by means of the keys.

With these and other objects in view, as will more fully hereinafter appear, the invention consists of the novel construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Referring now to the drawings, Figure 1 is a transverse sectional elevation of the machine constructed in accordance with my invention. Fig. 2 is a top plan view, broken away and shown partly in section to illustrate the registering mechanism. Fig. 3 represents a side elevation of a part of the registering-wheels, enlarged for the purpose of illustrating the manner of transferring. Fig. 4 is a sectional view through Fig. 3, taken so as to illustrate the cams and the transfer-levers. Fig. 5 is a detail view illustrating the mechanism for returning the several registering-



wheels to a zero position. Fig. 6 is a transverse sectional elevation of a front portion of the machine on the line *y y*, Fig. 2. Fig. 7 is a detail view of the manually-operated portion of the resetting mechanism.

Similar reference-numerals refer to similar parts throughout the drawings.

The registering-mechanism which forms the subject-matter of this application constitutes a part only of the operating parts embodying my calculating-machine, which being fully described in my aforesaid pending application may be here briefly referred to as comprising a casing 1, formed preferably of metal and provided with transparent panels of glass, such as 2, through which the operating parts may be inspected. The top of the casing is formed by a plurality of metal strips 3, extending from the glass 2, where they are supported on a transverse partition 4 to the rear wall of the casing. The abutting side edges of these strips are recessed to provide openings through which the shanks 5 of the keys pass. The keys are arranged in as many rows of nine each as the capacity of the machine may require, the first row being for units, the second for tens, the third for hundreds, &c. The keys of each row are provided with finger-pieces 6, which are successively numbered from "1" to "9," beginning at the front of the machine. The shanks of the keys are formed of metal bars provided with shoulders 7, arranged at progressively-decreasing distances from the finger-pieces of each row from front to rear, so that the successive keys of a row have strokes of varying length. In the case of the keys numbered "9" these shoulders may be dispensed with, when the finger-piece will serve as a stop to limit the downstroke of the key. From this arrangement it follows that each key will have a stroke whose length is proportioned to its numerical value. Each shank is longitudinally slotted at 8 and provided at its lower end with a circular plate 9, which enters a cylindrical casing 10, secured to the bottom of the casing and serving as a guide for the lower end of the keys. Coiled springs 11 within these casings engage plates 9 and act to return the keys to their initial position.

Corresponding with each row of keys is a rocker-shaft 12, journaled in bearings in plates 13 and 14, disposed, respectively, at points near the front and rear walls of the casing and further supported at intermediate points by cross-bars 15. The bearing portions of the shaft are reduced to prevent its longitudinal displacement. Each shaft 12 is operatively connected with the keys of a row by means of nine rocker-arms 16, each of which passes through the slot in a key-shank and is adapted to be engaged by an antifriction-roller 17, journaled in the shank when the key is depressed and moved to rock

the shaft 12. The total extent of the shaft's travel being preferably fifty-four degrees, it follows that the extent of the movement for each unit's value will be six degrees. Each rocker-shaft is acted upon by a spring 18 through coöperating levers 19 and 20 (more fully described in the companion application) to return it to its initial position as soon as the depressed key which operated it has been released and returned by its spring 11. The upward movement of the keys is stopped by small pins 21, extending through the key-shanks and adapted to engage the under side of the top of the casing.

The movements of the rock-shafts 12 are transmitted to the registering mechanism by means of arms 22, keyed to the front end of the shafts and carrying dogs 23, which engage ratchet-wheels 24, mounted on short shafts 25. These shafts are journaled in the partition 4 and bearing-plates 13 and carry gear-wheels 26, disposed near the partition 4. Gear-wheels 27, mounted on shafts 28, mesh with gears 26, these counter-shafts being journaled in the partitions or plates 4 and 29, which are preferably angled at their lower ends and bolted to the bottom of the casing. These counter-shafts also carry the units-registering dial 30, and tens, hundreds, &c., registering dials 31, which are keyed thereon and disposed between the two bearing-plates. The transmission-gearing is designed to transmit to each dial a rotary movement corresponding to that imparted to its respective shaft 12 by the depression of a key, which movement will advance the dial the number of points represented by the operating-key.

Though the mechanism hereinbefore described is that preferred to operate the registering-dials, it will nevertheless be understood that my present invention relates to registering mechanism such as obviously may be operated by other key-actuated or key-controlled operating means.

The registering mechanism comprises a units-dial 30 and any desired number of dials 31 for tens, hundreds, thousands, &c., according to the capacity of the machine. The dials are all similar in character, consisting of wheels or disks having preferably two sets of digits from "0" to "9" arranged in rotation around their peripheries. The units-dial will be operated by the first row of keys on the right through their respective shaft 12 and transmission-gears, the tens-dial by the second row of keys and their shaft 12, the hundreds-dial by the third row of keys, &c. Each of the dials carries a ratchet-wheel 32, having a number of teeth corresponding to the number of digits on the dial—i. e., twenty. Spring-pressed pawls 33, fulcrumed to the plate 29, engage each ratchet-wheel and act to prevent a reverse movement of the dials. Each dial is further provided with a cam-sur-



face, this surface being preferably formed by the periphery of a cam-disk 34, which is secured to or formed integral with the dial. In accordance with the present construction this disk will have two cam-surfaces, one for each set of digits, which terminate in shoulders 35, disposed opposite the "0" digit of each set. Each cam-surface commences at the termination of a shoulder and increases on a gradual arc until it terminates at the other shoulder. A lever 36, pivoted to the plate 4 at a point above and to the right of each cam-disk, rests upon the adjacent disk, so that with each complete rotation of the latter the lever will be twice raised by the action of the cam-surfaces and lowered by dropping off the shoulders. The levers preferably engage the disk at a point well to the left of their centers and are of sufficient length so that their free ends project beyond the arc circumscribed by the cam-shoulders. Referring now to Figs. 3 and 4, the units-dial 30 is covered by a stationary shield 37, connected to the plate 29 by bolts 38. This shield or plate has a sight-opening 39 of sufficient size to expose only one of the digits on the wheel 30 to inspection through the glass plate 2, Fig. 1. Each of the dials 31 are covered by segmental shields 40, preferably formed of light sheet metal and fulcrumed loosely on the shafts 28. These shields serve to cover the upper periphery of the registering-dials and are provided with a sight-openings 30, which expose only one of the digits on each of the dials at a time. An arm 41 extends downwardly at an angle from each of the shields 40 and carries at its lower end a spring-pressed pawl 42, which is adapted to engage the teeth of a ratchet-wheel 32 and impart to this wheel and its corresponding dial any forward movement received by the shield. The shields do not project over the cam-disks 34, upon which the levers 36 rest; but the fulcrumed shields 40 are each provided with a pin or lug 43, which projects over the cam-disk and engages with the lever 36, which rests upon the cam-disk of the adjacent dial of lower degree. Thus the lever resting upon the cam of the units-dial is adapted to engage the pin carried by the shield covering the tens-dial and the lever resting upon the cam of the tens-dial will engage the pin on the shield for the hundreds-dial, &c. A spring 44, secured to a stationary part of the frame, such as the plate 29, bears at its free end against a pin 45 on each of the shoulders 40 below its fulcrum-point and acts to oppose the action of the levers 36 in rocking the shields and also to restore the shields to an initial position. The springs 44 hold the pins 43 in engagement with the free ends of the lever 36, so that the shields will necessarily respond to movements of the levers.

The carrying or transferring operation is

performed in the following manner: Assuming that the several dials occupy their initial positions, in which the digits "0" will be visible through the sight-openings in the several shields, each of the levers 36 will rest at the base of one of the cam-surfaces, the shouldered end 46 of the lever being adjacent to one of the shoulders 35, over which the free end 47 of the lever projects and engages with the pin 43 on the dial-shield to the left. As the keys of the machine are operated to register a given number—say "594"—the first three dials to the right will be rotated by the operating mechanism, so that they expose, through the sight-openings 39, the numerals "594." When this is the case, the shields, cams, and levers for these dials will occupy the positions indicated in Figs. 3 and 4. It will be noted that the units-dial cam has lifted its lever 36 nearly one-half of its travel, which movement of the lever has been imparted to the shield 40 of the tens-dial, which has been thus rocked on its axis from its initial position indicated by a dotted line. The engagement of the pawl 42, carried by the shield-arm 41, has moved the tens-dial forward approximately half a step, as may be noted from the position of the pawl 33 with regard to the ratchet-teeth. The operation of the tens-dial to expose the digit 9 leaves this dial on the point of transferring or carrying to the hundreds-dial. Thus it will be noted that the tens-lever 36 is nearly at the top of the cam-surface and in a position where any further movement of the tens-dial will lift it and throw the hundreds-shield forward sufficiently to cause the pawl 42 to drop behind the ratchet-tooth of the hundreds-dial, on the edge of which it is shown resting. As this occurs the tens-lever drops behind shoulder 35, when spring 44 swings the hundreds-shield 40 to the right and exposes the next digit of higher order, the hundreds-dial being held against a similar movement to the right by its engagement with pawl 33. This carrying operation is positive, requires only a gradual application of power, maintains the exposed digits in full view until the point for registering the digit carried forward and exposing a higher numeral is reached, and acts independently of the operating mechanism, it being noted that the forward movement imparted to a dial by its shield is transmitted, through the meshing gears 26 and 27, to the ratchet-wheel 24, which moves forward, bringing other teeth into engagement with pawl 23. The ratchet-wheel 24 will be preferably of considerable diameter and provided with a large number of very fine teeth, the purpose being to have as great a number of teeth as possible subtended by the arc of movement of the ratchet-wheel in registering one digit. The effect of this is to minimize the lost motion between the arm 22 and the wheel 24, due to the carrying action, so that



it will be less than the play allowable for the digit exposed through the sight-opening of its dial-shield.

With the mechanism thus far described the depression of any key in any vertical column will effect rotative movement of the disk at the foot of that column to an extent dependent on the digit-key depressed, and, further, the transfer from disk to disk may be made so that the successively-increasing totals will be at all times visible through the glass panel 5, the arrangement of the rocking shields being such that the sight-openings in the latter will remain above a previously-exposed digit until the shield is allowed to move over the next digit.

To the forward end of each of the dial-shafts 28, which project through the plate 29, is secured a cross-bar 48, disposed in a plane parallel with the dial and provided at or near its ends with projecting pins 49, which are adapted to be engaged by the resetting mechanism hereinafter described and effect the rapid restoration of all the dials to initial or zero position.

The resetting mechanism is disposed at the front end of the casing and comprises a swinging plate or support 50, having lugs 51 at its opposite lower corners, which are pivoted by pins 52 to the side walls of the casing. The pivot-point for the plate is so disposed that a spring 53, which engages a lug 54 on the opposite side of the plate from the lugs 51, normally inclines the plate to the front of the machine, holding it at an oblique angle to the base of the casing. The plate is provided with clips 55 for the support of a rack-bar 56, extending transversely of the machine, the upper edge of the bar having a continuous rack in engagement with a plurality of mutilated gears 57. The gears 57 are mounted on studs 58, carried by the plate 50, each stud being substantially in alinement with each of the dial-shafts 28. Each gear has connected thereto a radially-disposed arm 59, that is adapted to engage with one or the other of the pins 49 on the cross-bar 48 when the plate 50 is swung on its pivots to a vertical position; but normally these arms 59 are held away from the bars 48 and pins 49, so that the latter are free to rotate with the dials. When the arms 59 are in position to engage one of the pins 49, their arc of travel with the gears 57 is sufficient to pick up each of the bars 48 and move the dials through shafts 28 to zero position. The plate 50 is further provided with bearings for the reception of a shaft 60, which extends outward through a vertically-disposed slot 61 in the front wall of the casing. To the outer end of this shaft is secured a disk 62, carrying a pin 63, which projects through an arcuate slot 64 in a cam-disk 65, which is loosely fulcrumed on the outer end of the shaft 60. The cam-disk rests on a small shelf 66, se-

cured to the front of the casing, and is adapted to be operated by a handle 67, which under normal conditions rests against a pin 68, projecting from the casing. To reset the dials to initial position, the crank 67 is moved upward, which causes the cam-surface of the disk 65 by bearing against shelf 66 to raise the outer end of the shaft 60, and thus swing the plate 50 rearward to a position where the arms 59 on the gears 57 are in the path of movement of the pins 49. A movement of the lever for about eighty degrees is required to effect this positioning of the plate 50, and during this movement the slot 64 in the cam-disk prevents engagement of the latter with the pin 63, so that the disk 62, which is keyed to the shaft, is not moved. After this, however, the left end of the slot will engage the pin, and as the movement of the lever continues until stopped by the pin 69 the disk 62 will be turned and its movement transmitted, through shaft 60, to a gear 70, connected to the rear end of the shaft and disposed beyond the plate 50. This gear meshes with a short rack formed on the bottom of the rack-bar 56, and thus imparts sidewise movement to the rack-bar. The movement of the rack-bar is transferred to all of the mutilated gears 57, which swing their arms 59 through an arc sufficient to engage one or the other of all the pins 49 and restore the dials to zero position by the time the crank-lever 67 has completed its movement by engaging stop 69. As the crank is moved to the left a reverse operation takes place, which moves the rack-bar to the left and restores the gears 57 to the position indicated in Fig. 5 and permits the spring 53 to swing the plate 50 out of its operative position.

The provision of two sets of digits on the dials necessitates the use of two pins 49 and, as before stated, two cam-shoulders 35. It will be obvious, however, that a greater or less number of sets of digits may be used, in which case the said parts will be increased and decreased accordingly.

Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a registering mechanism, a plurality of independently-operable registering-dials, sets of digits thereon from 0 to 9, means to transmit gradually from dial to dial a digit-carrying movement throughout the dials' movements in exposing said sets of digits, and means to retain only the registered digits exposed to view on the dial or dials during said carrying movement.

2. In a registering mechanism, a plurality of independently-operable registering-dials, one or more sets of digits from 0 to 9 thereon, cam means to transmit gradually from dial to dial a digit-carrying movement throughout the dials' movements in exposing a set



of digits, and means forming part of the carrying mechanism which act to retain only the registered digits exposed to view on the dials during said carrying movements.

3. In a registering mechanism, a plurality of independently-operable registering-dials, one or more sets of digits on each dial, cams movable with said dials, and means operable by said cams to transmit a carrying movement from dial to dial, said means acting gradually during the travel of said dials in exposing a set of digits to complete their carrying operation.

4. In a registering mechanism, a plurality of registering-dials, digits thereon, and independently-movable devices for each of said dials adapted to display a single digit at a time, said devices being operatively connected respectively to the dials of next lower value or parts movable therewith.

5. In a registering mechanism, a plurality of independently-movable dials, digits arranged thereon, means to effect a transfer movement from dial to dial, and a movable shield for each dial to which transfers are made, said shield having an operating connection with its respective dial and with parts movable with the dial of next lower value.

6. In a registering mechanism, a plurality of dials, characters thereon, and transfer mechanism for carrying from dial to dial which comprises as a part thereof a number of apertured plates which maintain in sight but a single character at a time on each dial.

7. In a transfer mechanism, a rotatable dial provided with numerals, a movable shield for said dial which is unaffected by the rotation of said dial, a display-opening in said shield through which a numeral is displayed, and means independent of said dial to move said shield to continuously display the same numeral until the completion of a transfer movement.

8. In a calculating-machine, a series of indicating-dials, a movable shield for each of the dials beyond the primary dial, the shields having each an opening for the display of a single character on the dial, means for imparting movement from each dial to the shield of the dial of next highest value, said shield moving with its dial during the transfer movement and returning independent of said dial to expose a higher numeral at the display-opening.

9. In a calculating-machine, the combination with a plurality of totaling-dials, of a transfer mechanism including a shield for each dial above the primary dial, each shield having an opening for the display of a single numeral, means for transmitting movement of each dial to the shield of the next highest dial, said shield moving with its respective dial to expose the same numeral until the

completion of the transfer movement and then moving independently of the dial to expose a higher numeral.

10. The combination in a calculating-machine, of a plurality of totaling-dials, shields for all except the primary dial, each shield having an opening for the display of a single numeral, ratchet-wheels secured to the dials, pawls carried by said shields and engaging such ratchet-wheels, cams revoluble with the dials, and cam-operated levers for engaging and moving the shields.

11. In a calculating-machine, the combination with a plurality of totaling-dials, of pivotally-mounted shields covering all except the primary dial, each shield having an opening for the display of a single numeral, a pawl-carrying arm movable with each shield, a pawl on said arm, a ratchet-wheel movable with each dial and with which the pawl engages, a cam movable with each dial, a cam-lever for engaging and moving the shield, and a spring for restoring each shield to initial position and thereby exposing a higher numeral at the display-opening.

12. In a calculating-machine, the combination with a plurality of totaling-dials, of a shield pivoted at the axis of each dial and having a display-opening, an arm secured to each shield, a pawl carried by said arm, a ratchet-wheel secured to the dial and engaged by the pawl, a cam carried by each dial, a lever for engagement with each cam which is pivoted at one end to a fixed point, and having its opposite end engaging a shield, and springs for restoring the shields to initial position.

13. In a calculating-machine, a plurality of totaling-dials, key-operated means for independently operating each dial, and transfer mechanism for gradually transmitting a digit-carrying movement from dial to dial throughout the movements of said dials, said operating means comprising lost-motion connections between each dial and its operating means and means to continuously display the same numeral until the completion of a transfer movement for each dial.

14. In a calculating-machine, a plurality of totaling-dials, a ratchet-wheel secured to each dial, a pawl engaging said ratchet-wheel and restricting its movement to one direction, a second pawl engaging said wheel, an element carrying said pawl which receives movement from the operating mechanism of the dial of lower value than that corresponding to the ratchet-wheel with which said pawl engages, the movement of said element being calculated to rotate the ratchet and its dial one step, and key-controlled devices for operating said dials which comprise a toothed wheel having a greater number of teeth than the dial ratchet-wheels, a movable element carrying a pawl which engages and rocks said



toothed wheel, and spring means to restrain said first-mentioned pawl-bearing element from following the movement of the dial ratchet-wheel when operated by the key-controlled devices.

15. In a registering mechanism, a plurality of dials, key-operated means to move said dials independently to display a digit thereon transfer mechanism for transmitting a digit-carrying movement to all except the primary dial, a fixed shield provided with a digit-display opening for the primary dial, movable shields provided with digit-display openings for the other dials, and means to cause said latter shields to move with their corresponding dials during a digit-carrying movement.

16. In a registering mechanism, a number of dials provided each with a set of digits, a cam-surface revoluble with each dial, said surface substantially corresponding in extent with the space occupied by the set of digits and terminating near the zero-digit, pivoted levers engaging said cam-surfaces and movable thereby, and devices, comprising a display-shield for the digits of each of said dials, which devices are engaged by said levers and impart their movement to the dials of next higher value.

17. In combination, a plurality of registering-dials carrying lugs or projections, and a resetting mechanism comprising a plurality of movable devices, a movable support on which said devices are movably mounted and which is adapted to bring them into the path of said projections, and operating means to move said devices, independently of said support, to engage said projections and turn said dials to initial position.

18. In a resetting mechanism, a set of dials, a movable plate, a plurality of arms pivotally mounted thereon, and operating means for shifting said plate to position said arms for engagement with said dials and for moving said arms relatively to said plate to reset the dials.

19. In a resetting mechanism a set of dials, a pivotally-mounted plate adjacent to said dials, pivoted arms mounted on said plate, a movable element engaging said arms to rock them, a shaft mounted in said plate and operatively connected to said element, a

cam-lever and a lost-motion connection between said lever and said shaft.

20. In resetting mechanism, the combination with a plurality of indicating-dials, of projecting pins or lugs connected thereto, a movable support, a plurality of rocking members carried thereby and each having a pin-engaging arm, a common actuating device for said members, and means for imparting movement to said actuating device and support.

21. In resetting mechanism, the combination with a plurality of indicating-dials, of projecting pins or lugs connected thereto, a movable support, a plurality of gears carried thereby and each having a pin-engaging arm, a rack engaging the gears, and means for imparting longitudinal movement to said rack.

22. In a resetting mechanism, the combination with a plurality of indicating-dials, pins or lugs connected to the dials, a pivotally-mounted plate, a plurality of studs carried by said plate, mutilated gears mounted on the studs, a rack for engaging the mutilated gears, a mutilated rack-driving gear, and a handled shaft carrying said driving-gear and serving as a means for adjusting the plate to and from resetting position.

23. In a resetting mechanism, the combination with a plurality of indicating-dials, of pins connected to the dials, a pivoted plate, a series of studs carried thereby, mutilated gears mounted on the studs and provided with pin-engaging arms, a rack for engaging the mutilated gears, a mutilated driving-gear engaging a second set of teeth on the rack, a shaft carrying the driving-gear, an enclosing casing having a slot through which the shaft extends, a shelf or bracket carried by the casing, a disk secured to the shaft and having a projecting pin, and a handled cam-lever bearing on the shelf or bracket and provided with a slot into which said pin extends.

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

JAMES F. MAYS.

Witnesses:

A. R. FORSYTH,  
THOMAS BOWRON.