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No. 751,611.

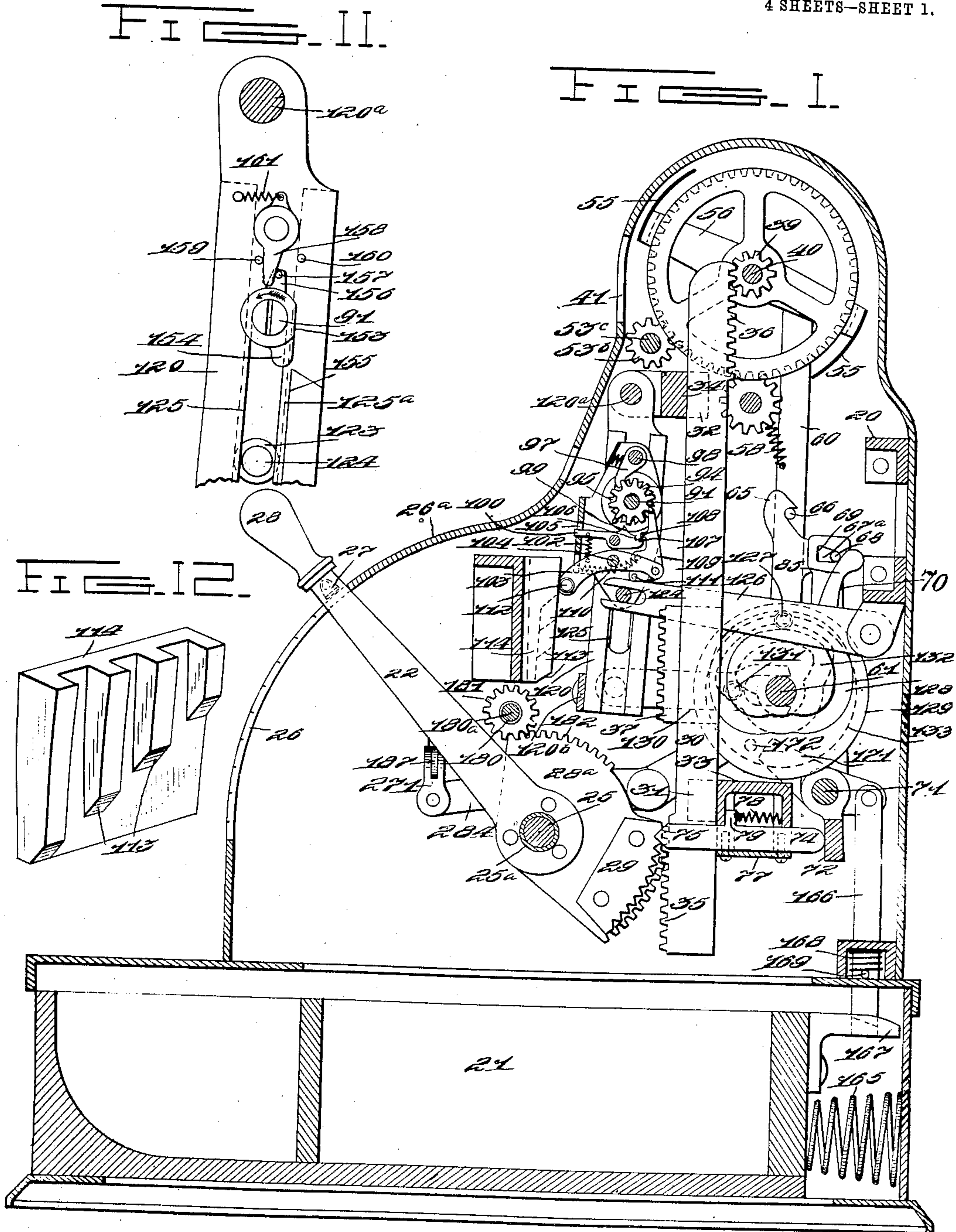
PATENTED FEB. 9, 1904.

T. CARROLL.
CASH REGISTER.

APPLICATION FILED AUG. 14, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses

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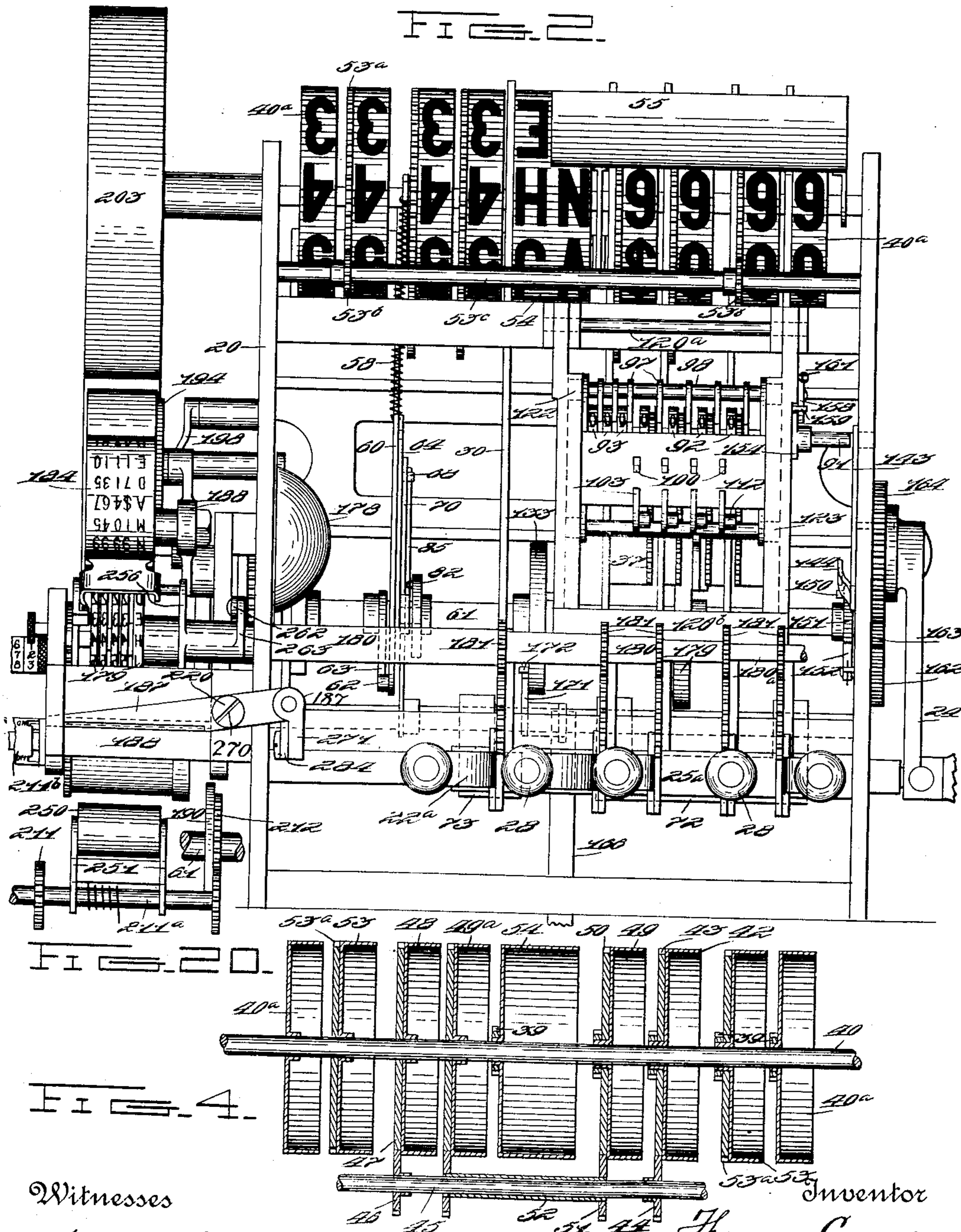
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4 SHEETS—SHEET 2.



Witnesses

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4 SHEETS—SHEET 3.

FIG. 12.

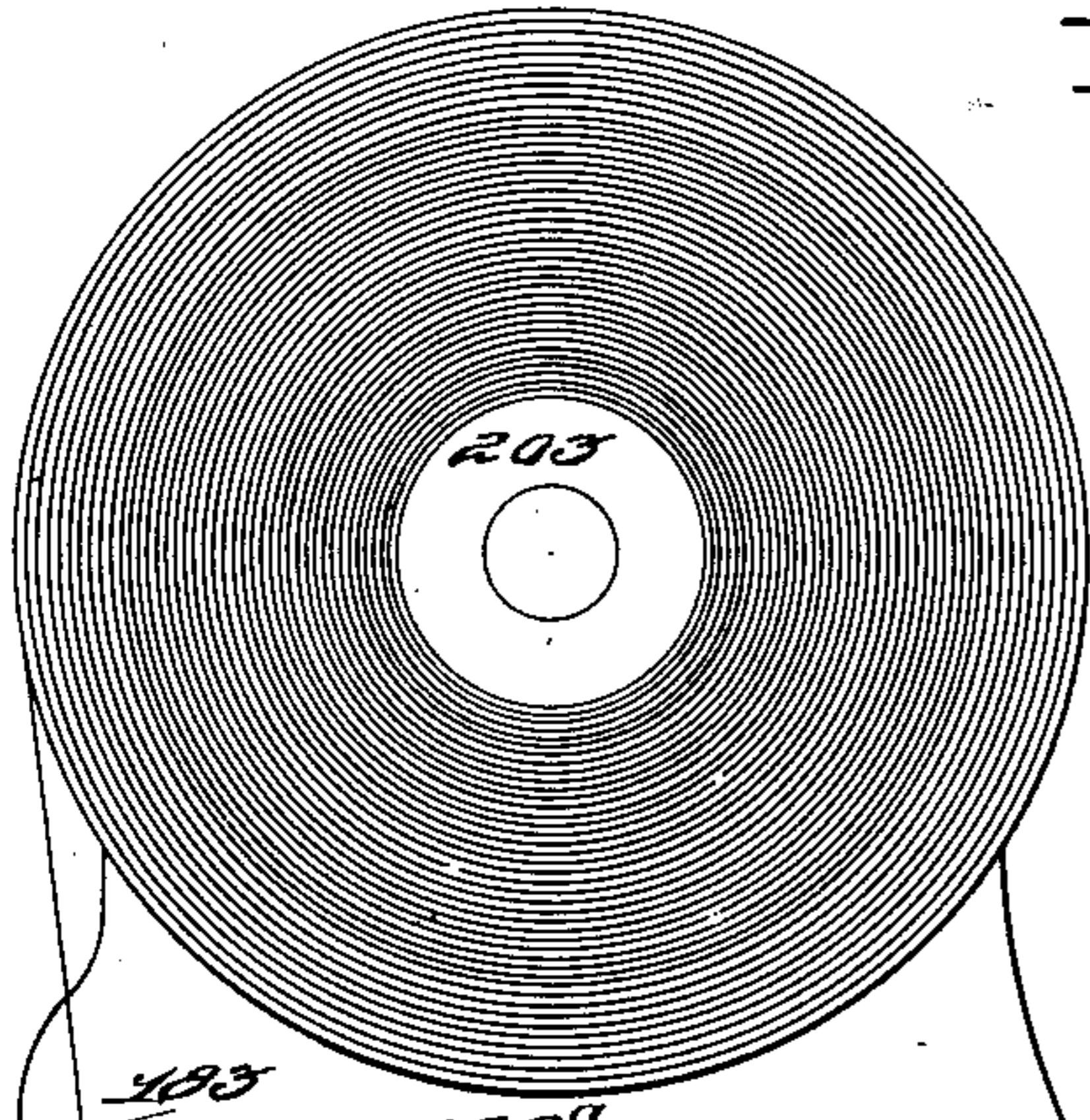


FIG. 13.

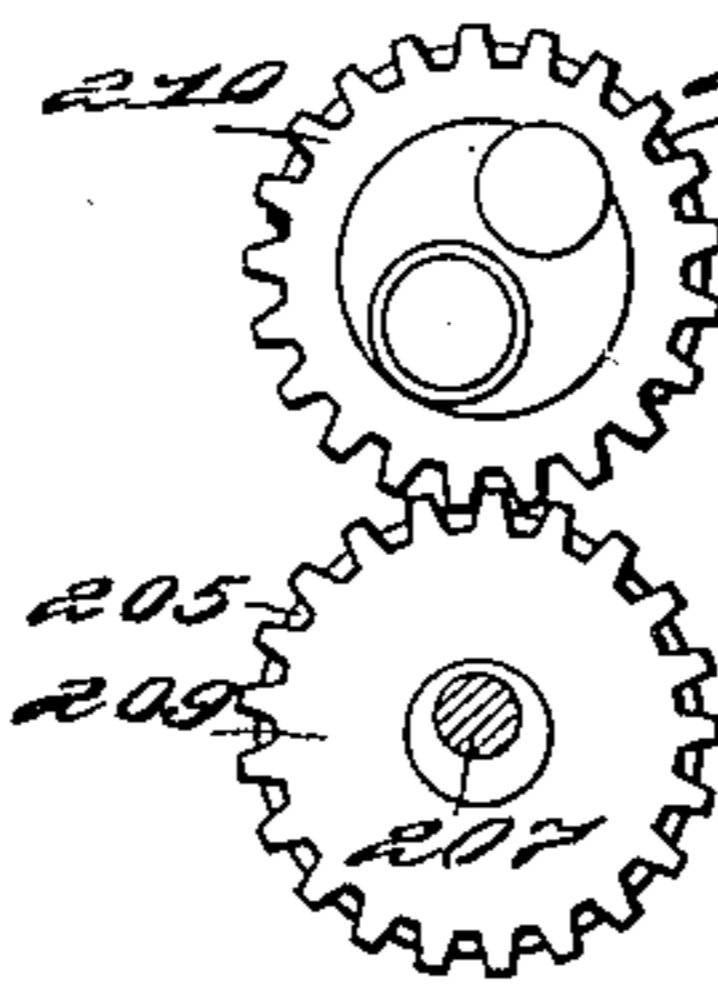


FIG. 14.

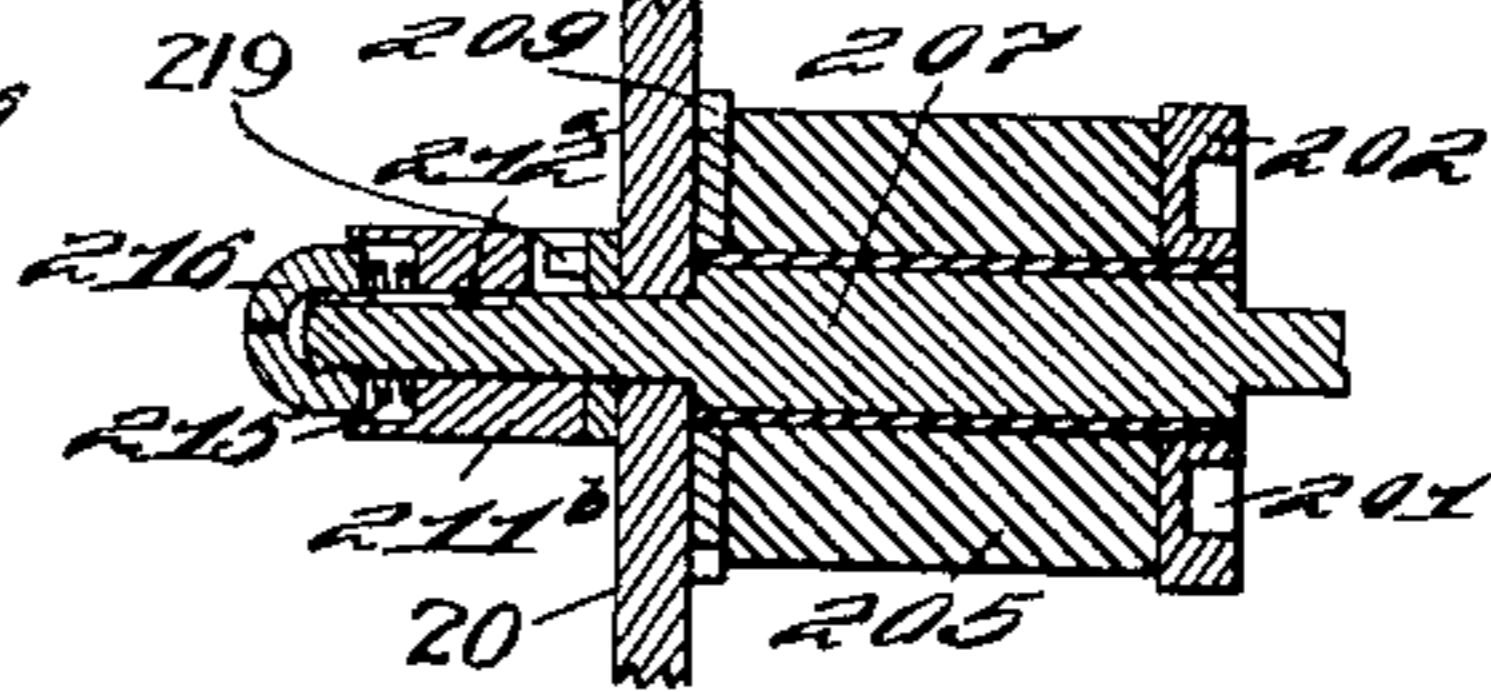


FIG. 15.

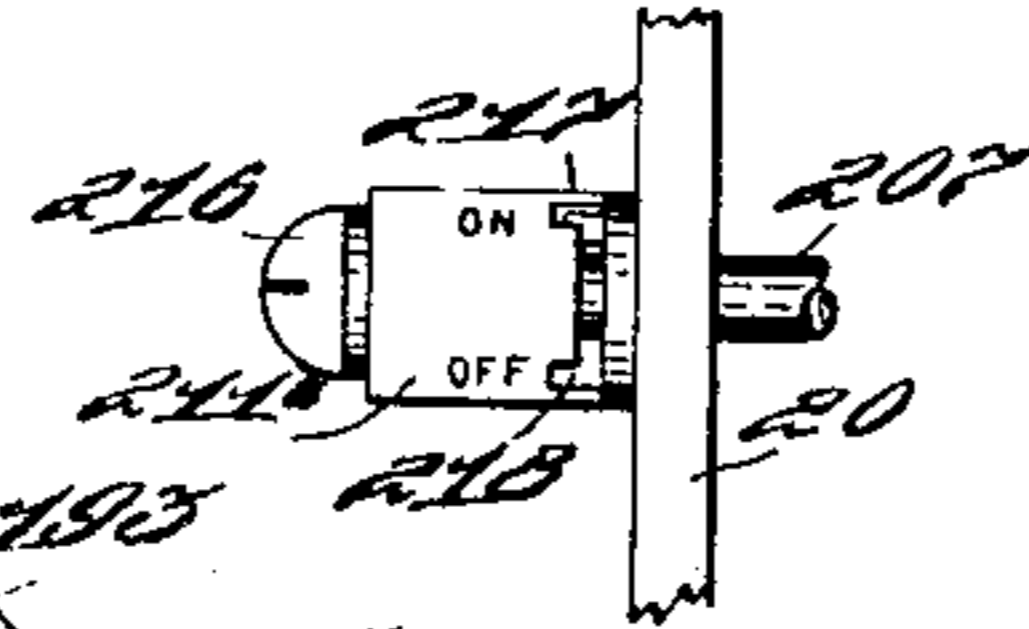


FIG. 16.

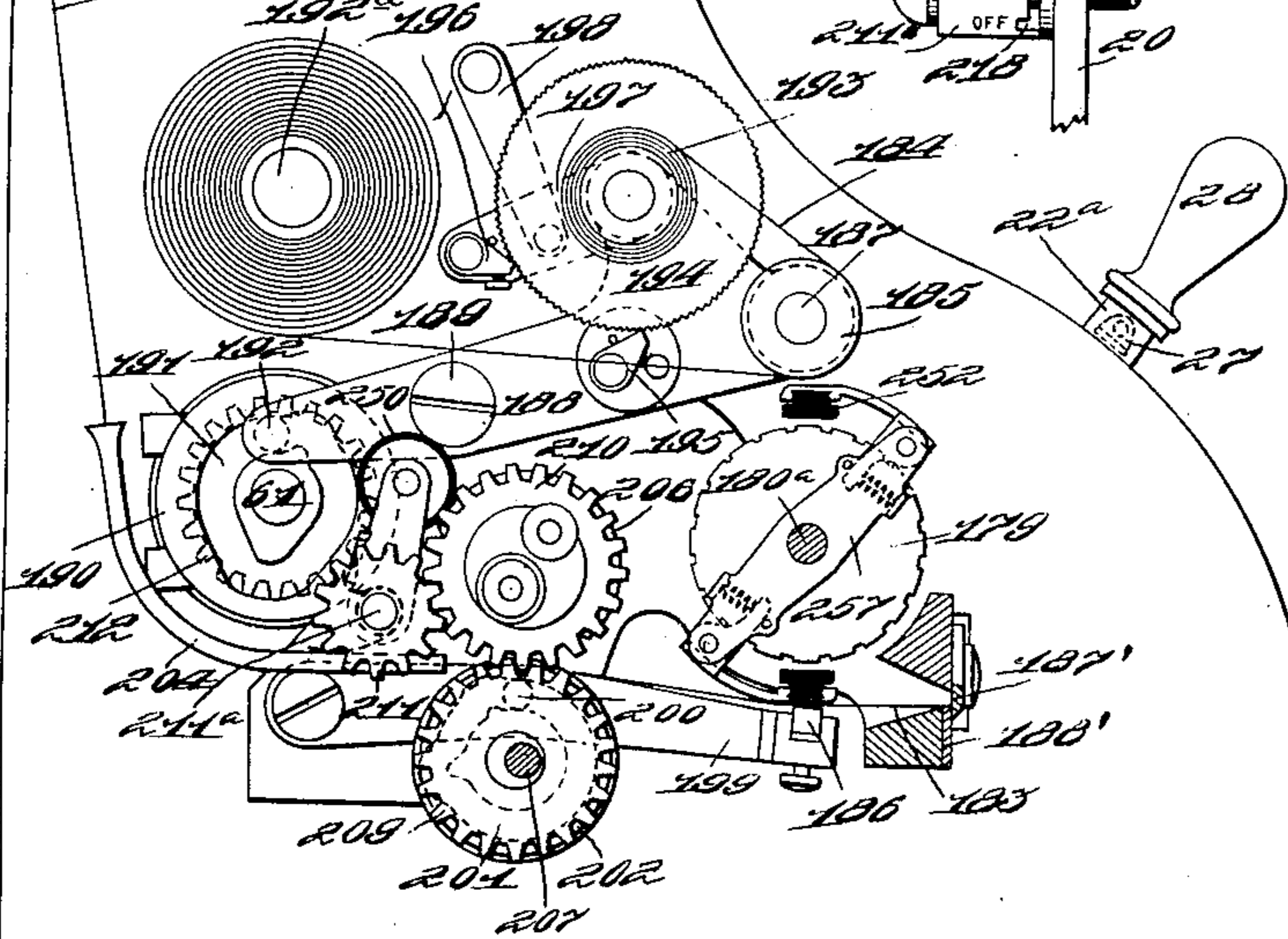
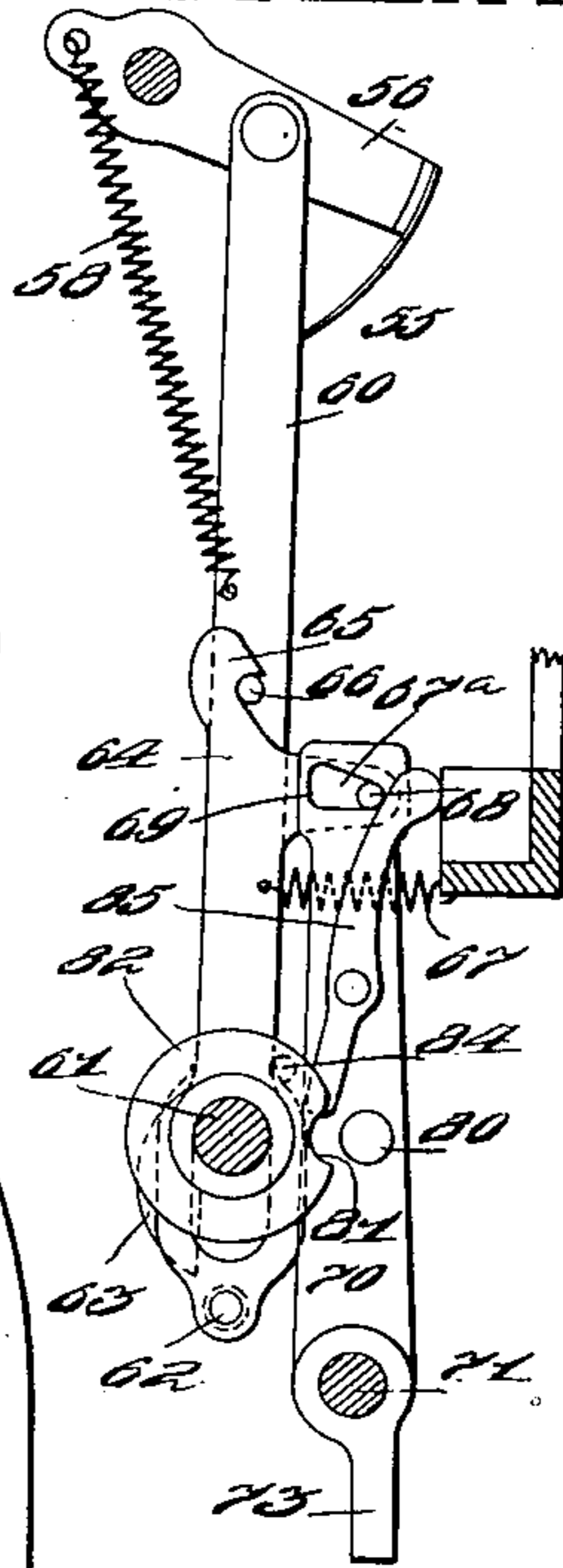


FIG. 17.

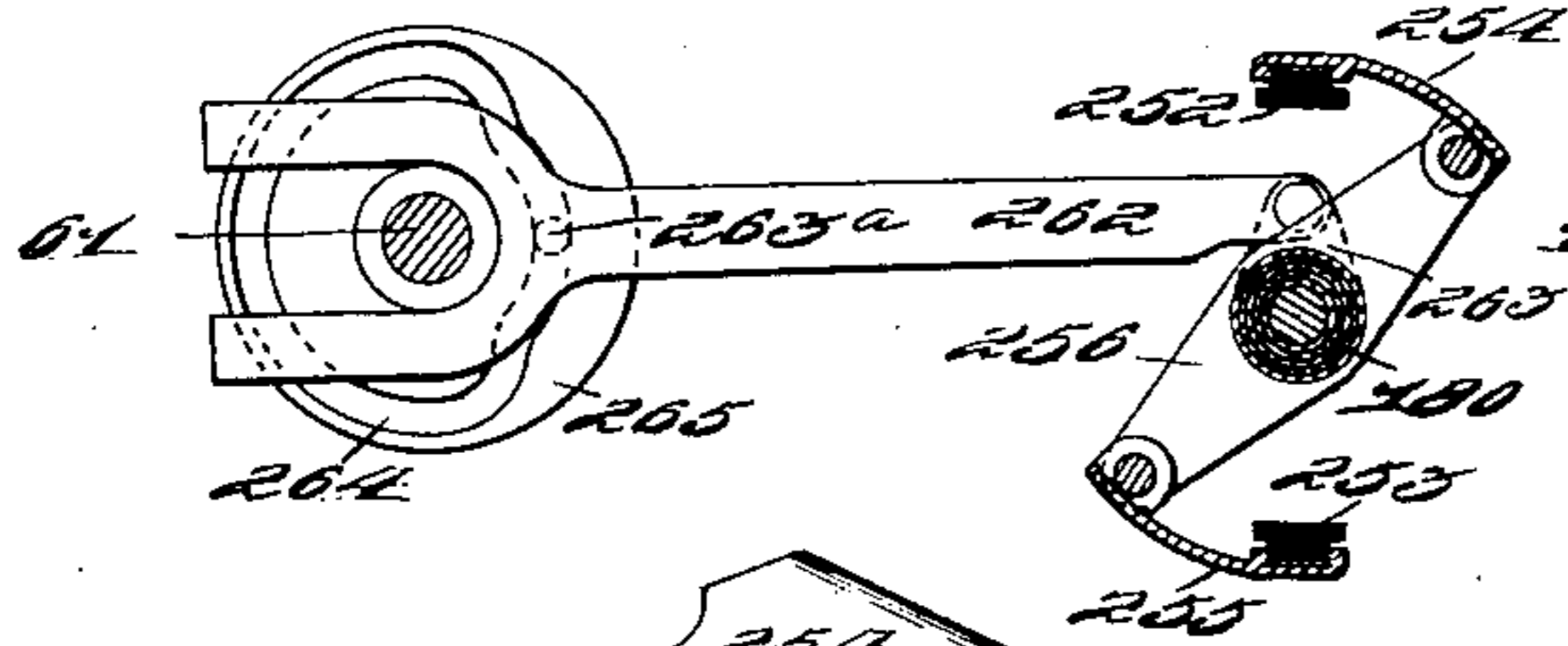
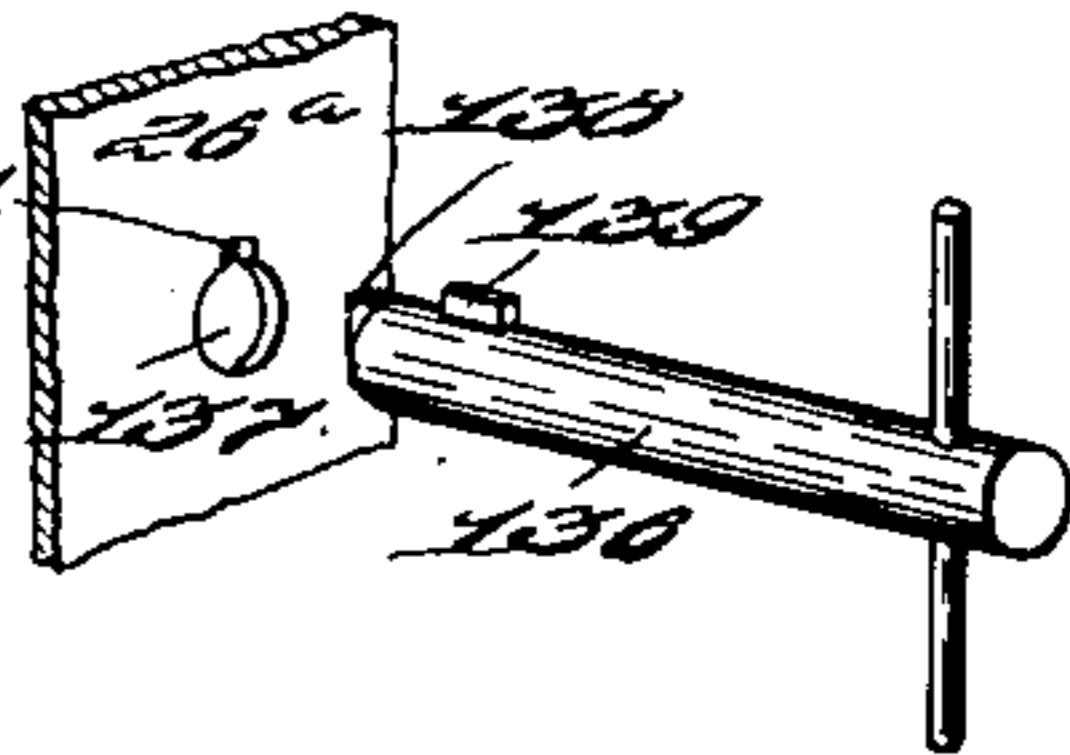


FIG. 18.



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4 SHEETS—SHEET 4.

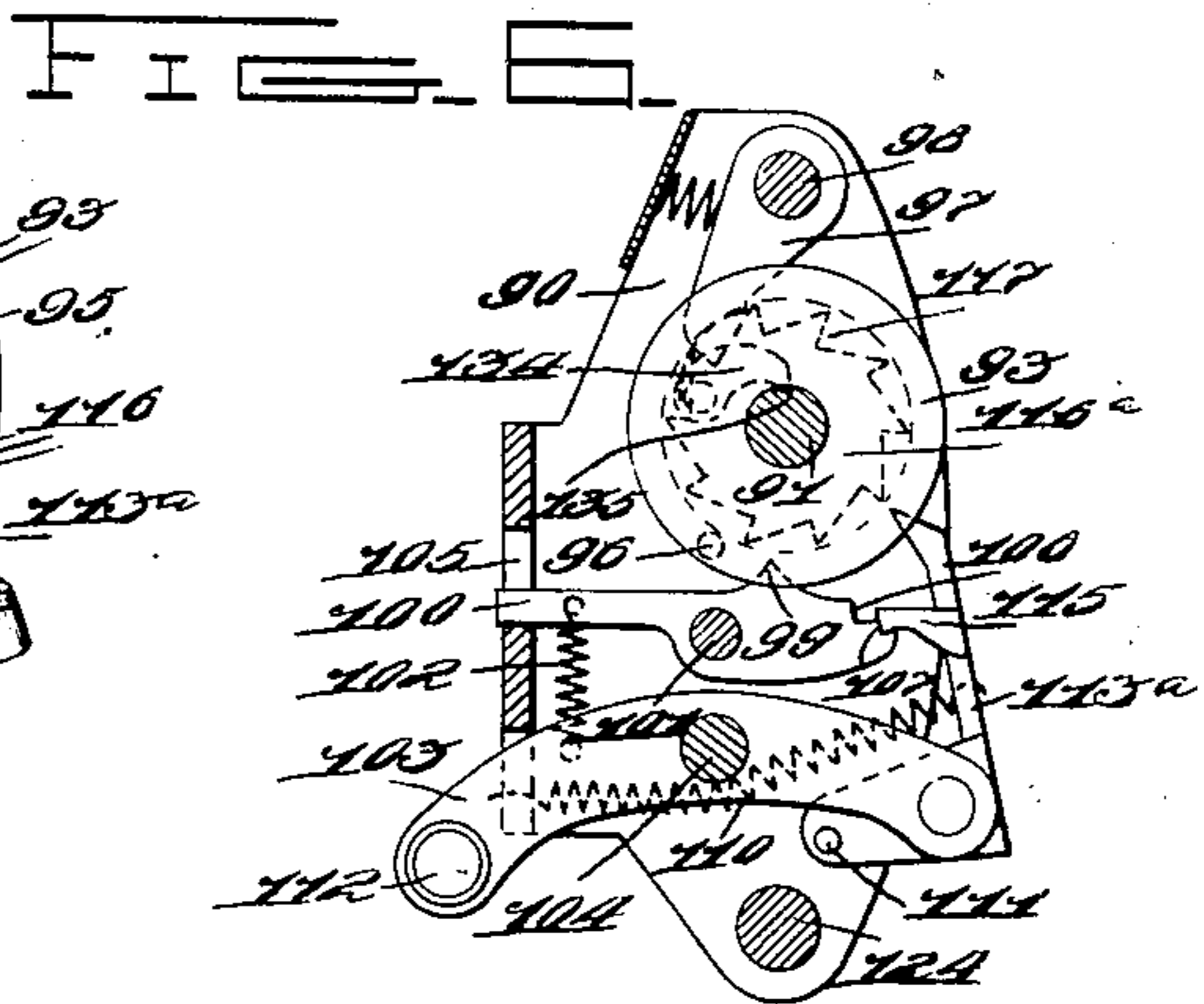
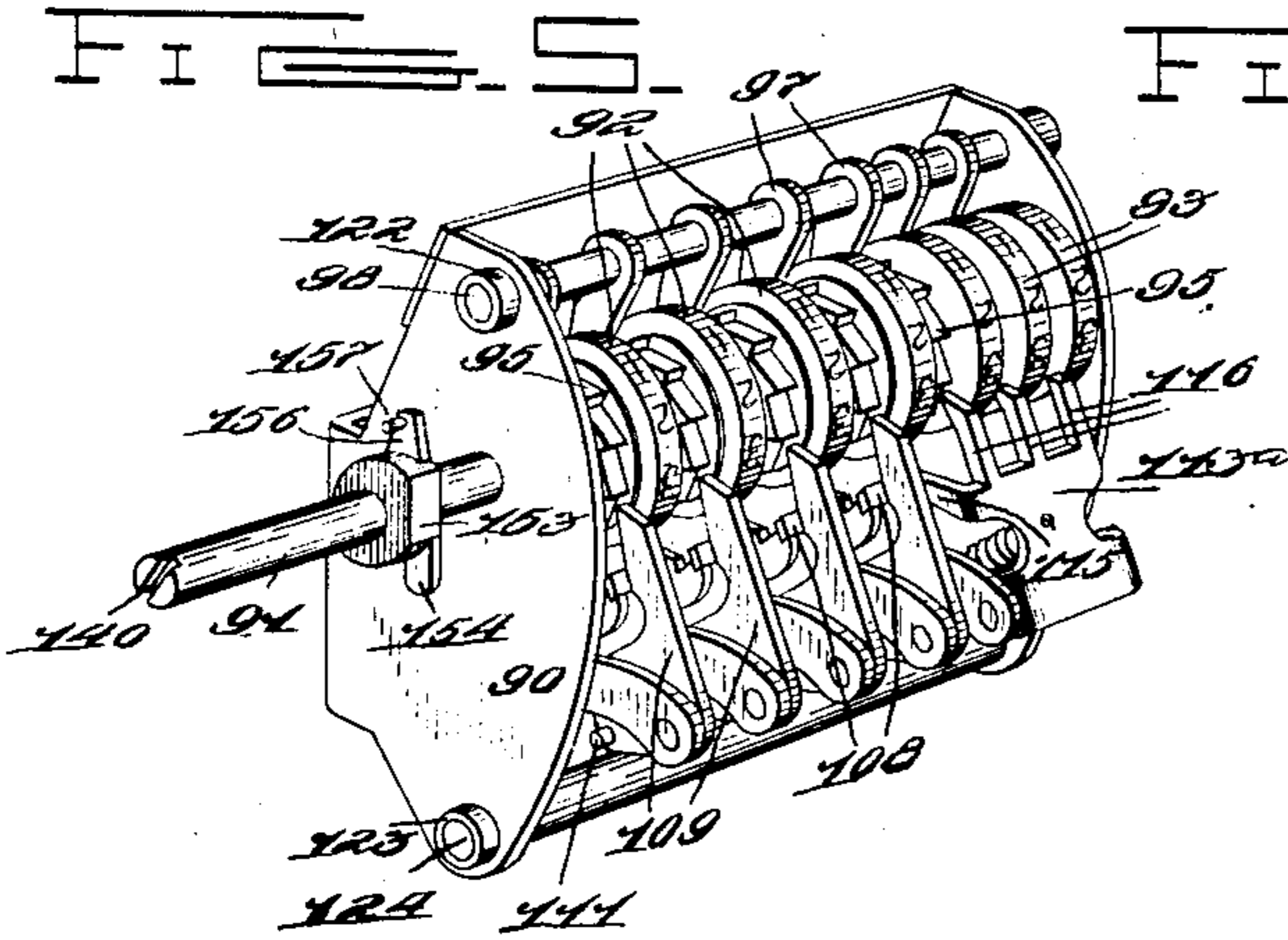
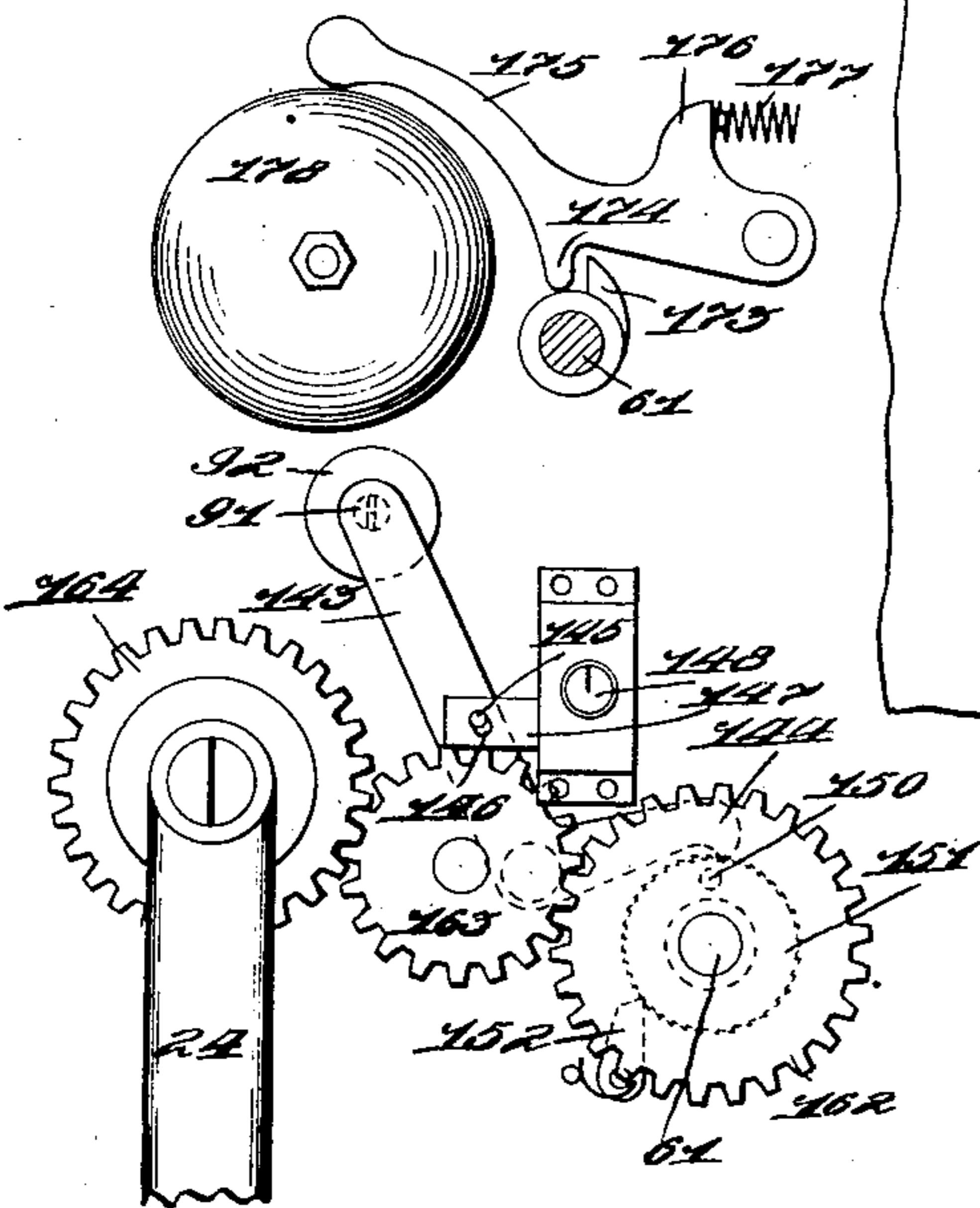


FIG. 7.

FIG. 8.



UNITED STATES PATENT OFFICE.

THOMAS CARROLL, OF DAYTON, OHIO, ASSIGNOR TO NATIONAL CASH REGISTER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 751,611, dated February 9, 1904.

Application filed August 14, 1901. Serial No. 72,018. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CARROLL, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Cash-Registers, of which I declare the following to be a full, clear, and exact description.

My invention relates to improvements in cash-registers.

It consists of novel constructions and combinations and arrangements of parts which operate in a new and novel manner, all of which will be hereinafter more particularly set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 represents a central vertical section through my improved machine. Fig. 2 represents a front elevation, partly in section, of said machine, the cabinet and cash-drawer being omitted. Fig. 3 represents an end elevation of my improved machine with the printer-hood removed. Fig. 4 represents a detail vertical longitudinal section through the indicators and connecting-gearing. Fig. 5 represents an enlarged detail perspective view of the counter and its frame. Fig. 6 represents a detail central vertical section through the same. Fig. 7 represents an enlarged detail front elevation of the graduated index portion of the cabinet. Fig. 8 represents an enlarged detail side elevation of the bell, its clapper, and the operating-cam for said clapper. Fig. 9 represents an enlarged detail side elevation of the operating-gearing and the devices for locking the machine while the counter is being turned to zero. Fig. 10 represents a detail side elevation of the knife-operating levers and cam. Fig. 11 represents a detail side elevation of the upper portion of the counter-guiding rock-frame, showing the devices for locking the counter against movement while the same is being turned to zero. Fig. 12 represents a detail perspective view of the stationary transfer cam-block. Fig. 13 represents a detail end elevation of the check-feeding rollers. Fig. 14 represents a detail longitudinal sec-

tion through the adjustable check-feeding rollers. Fig. 15 represents a detail side elevation of the knob for adjusting the check-feeding roller. Fig. 16 represents a detail side elevation, partly in section, of the flash. Fig. 17 represents a detail side elevation, partly in section, of the inking-pads, supporting-arms, and cooperating parts. Fig. 18 represents a detail perspective view of the turn-to-zero key and the apertured portion of the cabinet through which it is inserted. Fig. 19 represents a detail perspective view of one of the inking-pads and its carrying-arm, and Fig. 20 represents a detail front elevation of the inking-roller and surrounding parts.

My invention comprises the various parts which are essential to cash-registers generally, comprising a registering-wheel, indicators, an operating mechanism, and a cash-drawer.

In the particular embodiment of my invention, which is shown in the drawings, there are four straight vertical rack-bars which are at all times in engagement with their respective indicators. These rack-bars also carry the four registering-racks. In the present instance the power to effect the registration is applied through a crank-handle; but it might as well be applied in any other manner—as, for example, by the operation of the cash-drawer.

In operating the machine the rack-bars are moved from normal position to such an extent that the proper indicating-numeral will show through the wicket or window in the casing. This operation adjusts the registering-racks to position. Then finally the registering-wheels are given a movement during a part of which they are thrown into engagement with the registering-racks, and thereby the proper amount is registered.

In the aforesaid drawings, 20 designates the frame of the machine, 21 the cash-drawer, 22 the four setting-levers, and 24 the operating crank-handle.

As there are five setting-levers 22, segment-plates 28^a, alining plungers 74, and operating rack-bars 30, a description of one of each will suffice for all.

The setting-levers 22 are each journaled upon the transverse shaft 25 and extend forward through suitable slots 26, formed in the front of the cabinet 26^a, sleeves 25^a being mounted upon the shaft between the levers to hold the latter against lateral displacement. The setting-levers, commencing at the right, are appropriated, respectively, to the registration of units of cents, tens of cents, units of dollars, and tens of dollars. The fifth lever is a special department or clerk's lever.

As better shown in Fig. 7, the front of the cabinet is suitably divided and marked in proximity to the first four slots 26 from "0" to "9," commencing at the top and ending with "9" at the bottom. The fifth slot is similarly divided, but is marked with appropriate letters or characters representing the different clerks operating the machine or the different departments in connection with which it is used.

Secured to the outer end of each setting-lever is an operating knob or handle 28, and between the handle and the casing 26^a is a suitable index on the cabinet. At its inner end each setting-lever is secured to a segment-plate 28^a, each of which is provided with two sets of segment-teeth, the lower and rearmost of which engages with the rack 35, formed on the lower end of the corresponding operating rack-bar 30. To each segment-plate is also secured a notched alining plate 29, to be more fully described hereinafter. At its upper end each operating rack-bar is provided along its rear edge with a series of indicator-operating rack-teeth 36, which engage a pinion 39, one of which is secured to each of the four indicators which are arranged to show through the front window or wicket 41. It will therefore be understood that when the setting-lever is moved the indicator is thereby directly moved to indicating position. Each rack-bar is also provided with a series of registering rack-teeth 37, which are formed upon the front edge of plates, one of which is secured to each operating rack-bar, and the front edges of these plates are offset, so as to bring the four series of registering rack-teeth 37 closer together than might otherwise be, as shown in Fig. 2.

All of the indicator-wheels are journaled upon the transverse shaft 40, and upon their peripheries they are provided with indicating-numerals from "0" to "9," inclusive. The special indicator, which is wider than the others and which is placed between the four front indicators and the four back ones, has suitable characters, ten in number, to designate the different clerks or departments. The indicators are arranged in duplicate sets, so as to display the amount registered from the front and back of the machine, suitable openings being provided in the cabinet 26^a for that purpose.

The special indicator is arranged between

the duplicate sets of amount or value indicators and in the usual manner has two sets of indicating-numerals extending in opposite directions around its periphery. As described, the setting-levers 22 are connected directly with the set of amount or value indicators, which are shown from the right hand in Figs. 2 and 4; but the indicator-wheels of this set are connected directly to the corresponding indicator-wheels of the other set, and this is brought about in the following manner: The units-of-dollars indicator 42 carries concentric with it an operating-gear 43, which meshes with a pinion 44, fast upon a transverse shaft 45. Near its left-hand end the transverse shaft is provided with a like pinion 46, which meshes with the gear 47, which is carried by the duplicate or back indicating units-of-dollars indicator 48. In like manner the tens-of-dollars indicator 49 carries a gear 50, which meshes with one of two pinions 51, which are fast upon the sleeve 52. The other pinion on said sleeve engages a gear which is carried by the duplicate or back indicating tens-of-dollars indicator 49^a. The tens-of-cents indicators are directly connected with each other through their gears 53^a, which mesh with duplicate pinions 53^b, both being secured upon the transverse shaft 53^c. The units-of-cents indicators are both secured upon the indicator-shaft 40, and of course when one moves the other must move correspondingly. The special indicator 54 is lettered, as shown, and is provided with a double row of characters extending about its periphery. It is also loose on the indicator-shaft 40 and is operated directly by the engaging rack-bar 30. One row of characters is arranged to indicate in front of the machine and the other at the back of the machine.

During the time that the indicators are being moved or set they are hidden from view at the back and front, respectively, by flash-plates 55. (See Figs. 2 and 16.) These plates connect the outer ends of three levers 56, pivotally mounted upon the shaft 40 at the middle and near the opposite ends of the same. The said flash-plates when drawn into normal position obscure the indicators in a manner well known in the art. The said plates are normally drawn into position to extend in front of the openings 41 and conceal the indicators by a coiled spring 58, which connects one of said levers 56 to a link-bar 60. The flash-plates are moved away from the openings 41 by the depression of this link-bar 60, which is pivoted to one of said levers and is slotted at its lower end to receive the main rotation-shaft 61. Said bar 60 also carries an anti-friction-roller 62, which is arranged to be struck and depressed by a cam 63, fast to said shaft 61. The downward movement of the link-bar 60 rocks the levers 56, and thus swings the flash-plates away from the openings 41. The bar 60 when depressed is held in this de-

pressed position by a latch 64, pivoted on the shaft 61 and formed at its upper end with a hook 65, arranged to engage a pin 66, projecting from said bar. The latch is normally drawn forward into latching position by a coiled spring 67, which connects it to the main frame. By this construction when the bar 60 is drawn down it is automatically latched in its depressed position, and in order to allow the bar to again assume its normal position means must be provided for disengaging the hook end of the latch 64 from the pin 66. To this end the latch 64 is provided with a rearwardly-extending arm 67^a, carrying a pin 68, which projects into a flaring slot 69, formed in the upper end of a lever 70. This lever is rigidly mounted upon a transverse rock-shaft 71 and is adapted to be forced forward to operate the latch 64 by the rocking of said shaft. This rocking is effected through the medium of a pendent yoke-frame 72 and a pendent arm 73. (See Figs. 1, 2, and 16.) Either the yoke-frame or arm is adapted to be engaged and forced rearward by one of a series of spring-pressed alining plungers 74, having wedge-shaped ends 75, which engage the teeth of the respective rack-plates 29. These plungers are mounted in a hollow slotted cross-bar and are held up in position by the bottom plate 77 thereof. (See Fig. 1.) Each of the plungers is normally forced forward by its coiled spring 78, which engages a lug 79, formed on said plunger.

When one of the levers 22 is operated, its respective plunger 74 is forced rearward by its toothed plate 29, and thus forces either the frame 72 or arm 73, as the case may be, rearward also and rocks the shaft 71. This rocking of the shaft results in the operation of the latch 64, as aforesaid, which releases the flash and allows the same to be moved by its spring into position to obscure the indicators.

As soon as the person operating the machine moves any one of the setting-levers the first result is to instantly release the indicator-flashes, so that the indicators are thus obscured. The movement of the setting-lever through the spring-plunger 74 rocks the shaft 71, and consequently the lever 70. The latter strikes the pin 68, and thereby unlatches the hook 65, whereupon the spring 58 immediately swings the flash to a position to hide the indicators. It is desirable for obvious reasons that the flash be locked and incapable of operation during the rotation of the crank-handle, because of course the setting-levers are moved only when the machine is in normal condition. To this end I secure a pin 80 upon the lever 70, and coöperating with the said pin and upon the rotation-shaft 61 is a disk 82, having a notch 81, which is normally in alinement with the pin 80. Normally, therefore—that is, when the operating-crank is in its normal position, as shown in Fig. 2—the lever 70 can be rocked, because then the pin 80 can enter

the notch 81 of the disk 82. As soon as the crank is started, however, the disk is turned to bring a solid portion of its periphery into alinement with the pin 80, and of course then the lever cannot be rocked, as if this were attempted the pin 80 would simply strike against the periphery of the disk. In this manner the machine is locked until the movement of the operating-crank is completed.

In the machine as shown if a certain amount has been registered and it is then desired to again register the same amount it is not necessary to again adjust the setting-levers. The operator simply gives the operating-crank another turn.

In the machine thus far described the flash or shutter is dropped to obscure the indicators by the initial movement of any setting-lever. This prevents the indicators from being changed without registering the amount of the new indication. There is also another safeguard necessary—that is, to hide the indicators during the turning of the crank-handle. To this end a pin 84 is mounted on the disk 82 and is adapted upon the initial movement of said disk to contact with a short lever 85, which is pivoted between its ends to the lever 70. This operation positively rocks the upper end of the lever 85 against the pin 68, and thus releases the flash 55, as already described.

The registering mechanism of my cash-register is peculiar in that the counter comprising the registering-wheels 93 is mounted in a movable frame and is given a definite and constant movement or excursion every time the crank is operated. The operating rack-bars, on the other hand, are adjusted, as before described, to proper indicating and registering position and are held rigid and immovable during the registering movement. The counter is first thrown into engagement, so that the counter-pinions are in line with the teeth of the rack-bars. Then the counter is given its constant and further movement, so that the registering-wheels will be turned by their passage over the rack-teeth. When the counter has reached the limit of its movement, it is thrown out of engagement with the operating or registering racks, and while thus disengaged it is returned to normal position. During its return movement the transfer is effected, as will be hereinafter described. The said rack-plates, as before described, are set by the movements of the levers 22 and when so set are locked in position during the operation of the machine by the plungers 74, which are held to engagement with the racks 29 by the frame 72 and arm 73. The counter comprises a frame 90, the transverse counter-shaft 91, mounted therein, and a series of registering or counter wheels 92 and 93, mounted on said shaft. Each of the counter-wheels 92 has printed or impressed upon its periphery numerals from "0" to "9" and is provided with a pinion 94,

a ratchet-wheel 95, and a transfer tripping-pin 96, Figs. 1 and 6. The ratchet-wheels 95 are engaged by spring-pressed retaining-pawls 97, which are strung on a transverse shaft 98, mounted in the counter-frame. The transfer-pins 96 are so located that after a counter-wheel has made a complete revolution its respective pin will engage a nose 99, one of which is formed on each one of a series of trip-pawls 100, pivoted upon a transverse shaft 101. These pawls are held in their normal positions (shown in Fig. 1) by coiled springs 102, which connect them to transfer-pawl-carrying levers 103, pivoted upon a transverse shaft 104. The forward end of each pawl is limited in its downward movements by the lower walls of slots 105, formed in the counter-frame and through which all the pawls project. The rearward end of each pawl is formed with two shoulders 106 and 107, which are adapted to form stops for a lug 108, mounted on a transfer-pawl 109. These pawls are pivoted upon the respective levers 103 and are normally drawn forward by coiled springs 110, which connect them, respectively, to the counter-frame. When one of the counter-wheels 92 has made a complete revolution, its pin 96 contacts with the nose 99 of its respective trip-pawl and forces said pawl downward, with the result that the shoulder 107 is disengaged from the lug 108 and the latter allowed to engage the shoulder 106, in which position the transfer-pawl 109 will engage the teeth of the ratchet-wheel 95 of the counter-wheel of the next higher denomination. The inoperative position of a transfer-pawl, as shown in Fig. 5, is with its operative end held so as not to engage the operative side of the tooth of its cooperating ratchet-wheel 95, and therefore so long as this condition maintains the transfer-pawl may be reciprocated (as it is) at each operation of the machine and move along the other side of the tooth without moving the ratchet-wheel. The dropping of the trip-pawl, however, throws the upper end of the transfer-pawl into position to engage the operative side of the adjacent ratchet-tooth, and when the transfer-pawl is subsequently reciprocated the ratchet-wheel and the transfer-wheel carried thereby are turned forward the distance of one tooth. When after being tripped the ratchet-pawl is swung upward while in engagement with the ratchet-wheel, its upper end is thereby swung rearward, which is due to the turning of the ratchet-wheel, and therefore just as the transfer-pawl reaches the upper limit of its movement the rear end of its trip-pawl is swung upward, so as to engage the shoulder 107 under the lug 108. In this manner the transfer-pawl is restored to and held in normal position. In order to prevent overthrow, the transfer-pawls just at the upward limit of their movement are locked into engagement with their respective ratchet-wheels. This is accomplished by providing

the lower front end of each transfer-pawl with a pin 111, which is arranged to strike against the under side of the lower edge of the transfer-pawl-carrying lever 103.

The front ends of each of the transfer-pawl-carrying levers are provided with antifriction-rollers 112, which cooperate with graduated transfer-cam projections 113, which are formed integral with the base 114, as shown in Fig. 12. During the return travel of the counter the transfer is effected, as heretofore referred to, and this is brought about by the fact that the front ends of the transfer-pawl-carrying levers 103 strike the transfer-cam and are operated successively, as is usual in this class of machines.

The transfers between the left-hand counter-wheel 92 and the right-hand counter-wheel 93 and between any two adjacent counter-wheels 93 are accomplished by the compound pawl 113^a, which is pivoted upon one of the transfer-pawl-carrying levers 103. The compound transfer-pawl is operated in substantially the same manner as the other transfer-pawls, except that instead of being provided with a lug 108 it has a short forwardly-extending arm 115, Fig. 6. This compound transfer-pawl is provided with three operating-fingers 116, which are of different lengths and are arranged to engage the ratchet-wheel 116^a of the counter-wheels 93. Each of the ratchet-wheels 116^a is formed with a deep notch 117 between the teeth. When the counter-wheel has made a complete revolution and one of the prongs engages in the deep notch of the wheel, it will allow the middle one of the graduated fingers 115 to be swung forward enough to engage also its own ratchet-wheel. Therefore when this transfer-pawl is reciprocated all of the ratchet-wheels and their counter-wheels are turned one notch; but this arrangement of the compound transfer-pawl is well known in the art and, broadly, forms no part of my present invention.

The counter-frame carrying the counter-wheels is slidably mounted in a rock-frame 120 by means of four antifriction-rollers 122 and 123, Fig. 5, mounted, respectively, on the ends of the shafts 98 and 124, which latter connects the lower ends of the counter-frame sides. The antifriction-rollers run in vertical slots 125, of which there are two, one being formed in each of the two parallel vertical side bars of the rock-frame 120. These side bars are pivoted or hung upon a transverse shaft 120^a. Therefore the reciprocating frame may be rocked upon said shaft as a center. The lower ends of the said side bars are rigidly connected by tie-bars 120^b. Lateral movement of the counter-frame in the reciprocating frame is prevented by flanges 125^a, which lap over the edges of the slots 125, so that independently of the reciprocating frame the counter-frame is permitted only a vertical movement.

The counter is given a constant and definite vertical travel within the reciprocating frame whenever the crank is turned, and this is effected by means of a counter reciprocating lever 126, which is pivoted at its rear ends to a fixed bracket. Between its ends it is provided with a stud or antifriction-roller 127, which projects into a cam-groove 128, which is formed in a disk 129. The latter is rigidly secured upon the rotation-shaft 61, which is given a single and complete rotation at each operation of the machine. The curve of the cam-groove is so arranged with reference to its center of rotation that the counter reciprocating lever, and hence the counter, is swung down a certain distance and then returned to normal position at each operation of the machine. During said downward movement of the counter the counter-pinions are moved in the plane of the rack-teeth 37, and the registering-racks having been previously set the different counter-wheels are thereby turned a greater or less distance, according to the positions to which the registering-racks have been adjusted; but before the counter swings upward it is rocked out of engagement with and out of the plane of the registering rack-teeth, and it is so held out during its entire return movement. This is brought about by a link-bar 130, which at its front end is pivoted to the lower end of the reciprocating frame. Its rear end is forked, so as to straddle the rotation-shaft 61. In this manner the rear end of the bar is supported. Near the forked end of said bar a laterally - extending antifriction-roller 131 is provided, which projects into a cam-groove 132, which is formed in a disk 133, which, like the cam-disk 129, is fast upon the rotation-shaft. The formation of the cam-groove is such that when the counter-frame reaches the lower position of its travel the counter-pinions are not immediately moved out of mesh with the registering-rack, but a sufficient interval of rest occurs there to insure the absolute arrest of the movement of the counter-wheels. Then the rock-frame 120 is rocked forward, so as to disengage the counter-pinions and the registering-racks, and the reciprocating frame is held in this position until the counter has been raised almost to normal position. During this upward movement the transfer-pawl-carrying levers strike the cam projections 114, and the former are successively operated, as heretofore described.

The counter-wheels may be turned to zero by rotating the shaft 91, as the latter is provided with the usual form of longitudinal groove 135, with which coöperates the turn-to-zero pawls 134. This construction and mode of operation is too well known to require specific description. The counter-shaft 91 may be rotated to turn the wheels to zero by a suitable key 136, Fig. 18, which is inserted through an aperture 137, formed in the case of the machine. The key is provided

with an end flange 138 and a side flange 139, the former being adapted to fit into a groove 140, formed in the right-hand end of the counter-shaft, while the latter is adapted to pass through a notch 141, extending from the aperture 137. After the key has been inserted and partly turned it cannot be withdrawn until it has made a complete revolution, as will be readily understood.

It will be observed by reference to Fig. 9 that the end of the shaft 91 is normally guarded against the insertion of the key by the upper end of a bell-crank lever 143, which is suitably pivoted in the casing and is provided at its lower end with a locking-hook 144. This bell-crank is provided with a pin 145, which projects into a slot 146, formed in a lock-bolt 147. This bolt is controlled by a suitable key-lock 148, which is accessible from the exterior of the casing, so that the end of the lever 143, which forms a guard for the shaft, may be moved over or away from the end of the shaft 91 by the person having the key to said lock. When the bell-crank is operated to disclose the shaft 91, the hook 144 is moved into the path of a pin 150, mounted on a ratchet-wheel 151, fast to the shaft 61, thus locking the machine against operation. The said ratchet-wheel is engaged by a spring-pressed pawl 152, mounted on the main frame, so as to prevent all retrograde movement of the shaft 61.

In order to provide a positive stop for the counter-shaft when all the registering-wheels have been turned to zero, I provide said shaft with a collar 153, Figs. 5 and 11. This collar has an upwardly-extending arm 156, which is provided with a lateral pin 157, which coöperates with the pivoted stop-pawl 158. Coöperating with the tail of said pawl and on opposite sides thereof are two pins 159 and 160, which form the limits of movement of the stop-pawl. The spring 161 tends normally to throw the stop-pawl against the pin 160. Fig. 11 shows the parts in the position they assume when the counter has been turned to zero and before a subsequent operation of the machine. Normally the stop-pawl is on the opposite side of the pin 157. In turning the counter-wheels to zero the counter-shaft 91 is turned in the direction of the arrow, Fig. 11, from which it results that the pin 157 does not strike the stop-pawl until the register-wheels have been set almost to zero. Then the contact occurs and the stop-pawl is swung to the left against the tension of its spring until it is stopped by the pin 159. This brings the register-wheels also to rest with the zeros all in the proper reading-line. In this manner in turning the register-wheels to zero it is impossible to turn them too far, and of course they cannot again be reset or turned to zero until after a subsequent operation of the machine, because the parts remain in the position shown in Fig. 11 until the counter is again operated, whereupon

the pin 157 is of course slid downward and the stop-pawl is immediately swung by its spring over into its normal position.

In order to prevent any turning of the counter-shaft while the ratchet-wheels are passing over the registering-racks, the right-hand side of the collar 153 is flattened. I provide also a downwardly-extending arm 154. Coöperating with these is a straight-face flange 155, secured upon the rock-frame. It results from this construction that before the counter moves down far enough to bring the register-wheels into engagement with the registering-racks the lower end of the arm 154 has passed below the upper end of the flange 155, and thereby it becomes impossible to turn the register-wheels even partly to zero until the registering and transfer movement have been entirely completed.

The main rotation-shaft 61 receives its movement through the medium of a gear-wheel 162, which is fast thereon, Fig. 9. This gear-wheel receives motion from the operating crank-handle 24 through intermediate driving-gears 163 and 164.

The sliding cash-drawer 21 is provided with the usual ejecting drawer-spring 165, and is normally held within the drawer-case by a vertical movable latch-plunger 166, which engages an apertured latch-plate 167, mounted on the rear wall of the drawer in a manner well known in the art. The plunger 166 is normally forced downward by a coiled spring 168, which surrounds the same and bears with its opposite ends one against the transverse pin 169, mounted on said plunger, and the other against the cross-bar 170 of the main frame, through which said plunger passes. The upper end of the plunger is pivotally connected to a bell-crank lever 171, journaled on the shaft 71, and coöperating at its forward end with a pin 172, which projects laterally from the disk 133. The relative locations of the pin 172 and upper arm of the bell-crank 171 are such that the pin engages and rocks the bell-crank after the rotation-shaft has completed about two-thirds of a complete revolution.

As it is desirable in machines of the type herein described to provide an alarm or bell which will be sounded each time the machine is operated, I provide the shaft 61 at one end with a cam 173, which is so arranged as to engage a nose 174, formed on a bell-hammer lever 175, which is suitably pivoted upon the main frame. This lever is further formed with a vertical arm 176, between which and the rear portion of the main frame is interposed a coil-spring 177, whereby when the cam 173 forces the nose 174 upward a spring tension is created for subsequently operating the bell-hammer when the cam passes free of the nose, which operation will be readily understood. The fore end of the bell-hammer le-

ver is so located as to strike a bell 178, suitably arranged on the main frame.

The above description relates exclusively to devices for indicating and registering the desired amounts, and I will now pass on to the description of the device for printing the detail of each amount registered and indicated. This printing device comprises, primarily, printing-wheels 179. (Better shown in Figs. 2 and 3.) These are mounted rigidly on the respective outer ends of nested sleeves 180 and a shaft 180^a, the latter being journaled in the frame and forming a support for said sleeves, and are formed upon their peripheries with printing-type arranged in duplicate sets from "0" to "9," whereby duplicate impressions may be taken from above and below. The above statement is true in regard to all of the main type-wheels except that belonging to the special clerk's lever 22^a, which is provided with letters or characters in duplicate for representing the respective clerks or departments for which this special lever is intended. This clerk or department lever has the usual indicator connections before described, but is not provided with a registering-rack, and therefore has no connection whatever with the counting device. The nested sleeves 180 are suitably journaled on the main frame and are of different lengths, as shown in Fig. 2, so that their inner ends lie in proximity to the respective rack-plates 28^a. At its inner end each of these sleeves is provided with a pinion 181, said pinions meshing, respectively, with rack-teeth 182, formed on the upper portions of the plates 28^a. By this means the adjustment of the levers 22 or the lever 22^a will move the printing-wheels 179 correspondingly, so as to bring the proper numerals and characters to the respective printing-lines. The impressions on the check-strip 183 and upon the detail-strip 184 are secured by resilient platens 185 and 186.

I will first describe the upper platen 185, which prints the detail-strip. It is in the form of a roller which is journaled upon a stud 187, Fig. 3, secured and projecting laterally from the detail-strip printer frame or lever 188, which latter is pivoted upon the main frame at 189. The detail-strip printer-frame 188 receives movement from a cam-disk 190, fast to the projecting end of the rotation-shaft 61. The cam-disk is formed with a cam-groove 191, into which projects a pin 192, mounted on the rearward end of the said printer-frame. The formation of the cam-groove 191 is such that the frame 188 is rocked twice upon its fulcrum at each operation of the machine. The first rocking movement forces the ink-pad against the type, as hereinafter described, while the second movement, which is greater than the first, forces the detail-strip 184 against the inked type-wheels. The detail-strip is led from a supply-roll 192^a over

the printing-wheels and passes about the platen-roller 185. It is wound upon a feed-roller 193, which is mounted upon the upper end of the frame 188, so as to move therewith.

5 A toothed wheel 194 is fast to one end of the roller-feed 193 and is engaged by a spring-pressed retaining-pawl 195 on frame 188 and also by a spring-pressed feeding-pawl 196, mounted on the outer end of an arm 197, which
10 is pivoted to the frame 188. The arm 197 is pivotally connected to a link 198, pivoted on the main frame. It results from the above-described construction that when the frame 188 is rocked on its fulcrum the arm 197 will
15 be raised and lowered at its rear end, and thus cause the pawl 196 to feed the wheel 194 and feeding-roller 193.

The lower platen 186, which prints upon the check-strip, is mounted in the forward
20 grooved end of a platen-lever 199, which is pivoted upon the main frame, and is provided with a stud 200, projecting into a cam-groove 201, formed in a cam-disk 202. (See Figs. 3 and 14.) The formation of the cam-groove is similar to that of the groove 191, so that the lever
25 199 is reciprocated twice during each operation of the machine.

The check-strip 183 passes from a supply-roll 203, mounted on the main frame, down
30 through a guiding-chute 204, between feed and printing rollers 205 and 206, over the platen 186, and out between knives 187' and 188'. The feed-roller 205 is journaled on a shaft 207, which is journaled eccentrically in the main
35 frame, so that when said shaft is rocked the roller 205 will be moved down away from the roller 206, and thus stop the feed of the check-strip. As the cam-disk 202 is fast to the roller
40 205 and moves therewith, it will also be moved downward, so that when rotated it will not give sufficient throw to the lever 199 to operate the platen to make an impression. The
roller 205 receives its rotary movements through a gear 209, fast to one end thereof
45 and meshing with a gear 210 on the roller 206. The gear 210 meshes with an intermediate pinion 211, which is fast on a transverse shaft 211^a, carrying a similar pinion at its inner end that meshes with a gear 212, fast to the rota-
50 tion-shaft 61. (See Fig. 20.) The teeth of the gears 209 and 210 are of sufficient length to remain in mesh even though the gear 209 be withdrawn, as before described.

The rotation of the shaft 207 to effect the
55 above-described adjustment is accomplished by a sleeve 211^b, mounted loosely upon the outer end of the said shaft and provided with an internal pin 212^a, which projects into a longitudinal groove 213 in said shaft. The sleeve
60 is normally held against a portion of the frame 20 (see Figs. 14 and 15) by a coiled spring 215, mounted in its recessed end and held in place by a screw-cap 216, applied to the end of the shaft. The inner edge of the sleeve is

notched, as at 217 and 218, to engage with a
65 pin 219, mounted on the frame 20, and thus hold the sleeve and shaft in the position to which they are turned. To disengage the sleeve from the pin 219, it is drawn outward
70 against the tension of its spring. It is then turned and finally allowed to snap in again and become latched, which operation is well known in the art.

The printing devices of the roller 206 may be of any arrangement desired; but I provide
75 them with dating-types and consecutive-numbering types and operate them in any manner at present well known in the art. These types are inked by an absorbent ink-roller 250, mounted between pivoted arms 251, which are
80 spring-pressed, so that said ink-roller will engage and ink the types on the roller as the latter is operated. (See Fig. 20.) The inking devices for the regular printing-wheels 179 comprise two absorbent ink-pads 252 and 253, detach-
85 ably mounted in dovetail grooves formed in plates 254 and 255. These plates are pivotally mounted between the upper and lower ends of levers 256 and 257, which are journaled, re-
90 spectively, upon the outermost sleeve 180 and the shaft 180^a. Each of the plates 254 and 255 is provided with a lug or arm 258, (see Fig. 19,) which is adapted to abut against a stop-
95 pin 259, mounted on its lever 257, and be held normally in this position by a coiled spring
260, interposed between said arm 258 and a lug 261, formed on the lever 257. This pe-
culiar construction permits the pads 252 and 253 to be forced into engagement with the
100 types in printing position by the first movements of the platens which engage the plates 254 and 255. The levers 256 and 257 are rocked to move the inking-pads out of inking position by a bar 262, which is connected at
105 one end to a crank-arm 263, fast to the hub of the lever 256. The rear end of the bar 262, as better shown in Fig. 17, is slotted and embraces the main rotation-shaft 61. Said bar is also provided with a pin 263^a, which
110 projects into a cam-groove 264, formed in a cam-disk 265, fast to said rotation-shaft. The formation of the groove 264 is such that the ink-pads will remain in inking position until after the first movement of the platens and then will be moved out of the path of the plat-
115 ens to allow the latter to force the detail-strip and check-strip into contact with the inked types. After the check-strip leaves the lower platen it passes over a stationary knife 188', suitably mounted upon the main frame, and
120 under a movable knife 187', which is better shown in Fig. 2, and is pivoted upon the frame at 270. The right-hand end of the knife is connected to a pivoted lever 284, mounted on the main frame, by a link 271. The rear end
125 of the lever 284 is provided with a pin 285, (see Fig. 10,) which projects into a cam-groove 286, formed in a cam-disk 287, fast to the

shaft 61, whereby each rotation of said shaft will actuate said knife to sever the check from the check-strip.

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

1. In a cash-register, the combination with a series of longitudinally-adjustable racks, of a movable frame carrying a register, means for giving the frame a definite movement at each operation of the machine, and devices for adjusting the racks to bring a greater or less number of teeth thereof into the path of travel of the register according to the amount to be registered.

2. In a cash-register, the combination with a series of longitudinally-adjustable racks, of a movable frame carrying a series of register-wheels, means for giving the frame a regular excursion at each operation of the machine, and means for moving the said racks longitudinally to bring a greater or less number of teeth into the path of travel of the register-wheels.

3. In a cash-register, the combination with an operating mechanism, of a series of racks, devices for setting the racks according to the values to be registered, a register arranged to be moved over the racks and thereby operated, and means connected to the operating mechanism for giving the register a regular excursion over the racks at each operation of the machine.

4. In a cash-register, the combination with an operating mechanism, of a series of racks, a register arranged to be moved over the racks and thereby operated, and means connected to the operating mechanism for moving the register into and out of operative relation with the racks.

5. In a cash-register, the combination with an operating mechanism, of a series of racks, a register arranged to be operated by being moved over the racks, means for adjusting the racks longitudinally to bring a greater or less number of teeth into the path of the register, means connected to the operating mechanism for moving the register over the racks, and devices also connected to the operating mechanism for moving the register into and out of cooperative relation with the racks.

6. In a cash-register, the combination with an operating mechanism, of a series of racks, a register comprising a series of register-wheels, pinions fast to said wheels, means for moving the register over the racks, and means connected to the operating mechanism for adjusting the pinions and racks into and out of cooperative relation.

7. In a cash-register, the combination with a series of rack-bars, devices for setting said bars according to the value to be registered, a movable register, means for moving the register over the racks for effecting the registration, transfer devices carried by the register,

and rigid projections mounted independently of the register and arranged to be engaged by the transfer devices when the latter are set.

8. In a cash-register, the combination with a series of operating elements arranged to be set according to the value to be registered, a register, means for moving the register along said elements to effect the registration, transfer devices carried by the register, and stationary cam projections engaged by said transfer devices upon the movement of the register for effecting the transfer.

9. In a cash-register, the combination with a series of rack-bars, means for setting the bars according to the value to be registered, a register, means for moving the register over the rack-bars to effect the registration, transfer devices carried by the register and progressively - arranged stationary cam projections arranged to be engaged by the transfer devices upon the movement of the register to effect the transfer.

10. In a cash-register, the combination with a series of indicators, of a flash or guard for said indicators, a latch for holding said guard in position to expose the indicators, a series of setting devices, means for tripping said latch upon the movement of any one of said setting devices, an operating-handle independent of said setting devices and means for tripping said latch upon the operation of said independent handle.

11. In a cash-register, in combination with a series of pivoted setting-levers, a series of indicators, means connecting said indicators and levers, toothed rack-plates mounted on said levers, a series of spring-pressed plungers engaging said rack-plates, a guard for the indicators, a latch for said guard, and means operated by any one of said spring-pressed plungers for tripping said latch.

12. In a cash-register, the combination with a series of rack-bars, a series of pivoted levers for setting said rack-bars, a series of indicators geared to said rack-bars, a guard for said indicators, a latch for holding said guard in position to expose the indicators, and a series of locking-pawls for the levers.

13. In a cash-register, the combination with a series of operating-levers, a series of locking-pawls engaging the same, a movable member arranged to be operated by any one of said pawls, a pin mounted on said movable member, and a notched disk connected to the movable parts of the machine and arranged to cooperate with said pin.

14. In a cash-register, the combination with a series of setting-levers, an operating crank-handle, a series of indicators arranged to be set by said setting-levers, a guard for said indicators, a latch for said guard, means for tripping the latch upon the movement of any one of the setting-levers, and an independent device for tripping the latch upon the movement of the operating-handle.

15. In a cash-register, the combination with a series of setting-levers, rack-bars operated by the same, indicators geared to said bars, a register comprising a series of wheels having
5 pinions arranged to mesh with said rack-bars, a rock-frame supporting said register, an operating-handle, gearing connected to said operating-handle for first actuating the rock-frame and then moving the register along said
10 rack-bars.

16. In a cash-register, the combination with a series of elements arranged to be set according to the value to be registered, a register, an operating-handle for moving said register
15 along said elements whereby it may be operated, and a locking device for said elements arranged to be operated by said handle.

17. In a cash-register, the combination with a series of elements arranged to be set according to the value to be registered, a register, an operating-handle arranged to move the register along said elements whereby it may be operated, and an alining device for said elements
20 arranged to be operated by said handle.

25 18. In a cash-register, the combination with a series of racks, arranged to be set according to the value to be registered, of a rock-frame, a register mounted in the rock-frame so that it may slide therein and thus be drawn over
30 said racks and thus be operated.

19. In a cash-register, the combination with a series of operating elements arranged to be set according to the value to be registered, a register comprising a series of wheels, means
35 for moving the register along said elements to effect the registration, means for moving

said register to reset the same to zero and a device for preventing movement of the register along the operating elements after this resetting movement has been commenced. 40

20. In a cash-register, the combination with a register comprising a series of wheels and a shaft for turning the same to zero, a pivoted lever arranged to guard said shaft and adapted to lock the machine when operated, and a
45 lock and bolt for operating said lever.

21. In a cash-register, the combination with an operating mechanism, of a register, means for moving the register into and out of cooperative relation with the operating mechanism, turn-to-zero devices for the register, a stop mounted independently of the register for
50 arresting the turn-to-zero devices, and means for moving the stop out of the path of the turn-to-zero devices when the register is operated to engage the operating elements. 55

22. In a cash-register, the combination with a series of operating elements arranged to be set according to the values to be registered, a register, means for moving the register along
60 said elements to effect the registration, a device for resetting the register to zero, a movable stop for said resetting device which is disengaged from the latter when it is moved along the operating elements. 65

In testimony whereof I affix my signature in the presence of two witnesses.

THOMAS CARROLL.

Witnesses:

JOHN C. LOCKYER,
IRA BERKSTRESSER.