

No. 640,966.

Patented Jan. 9, 1900.

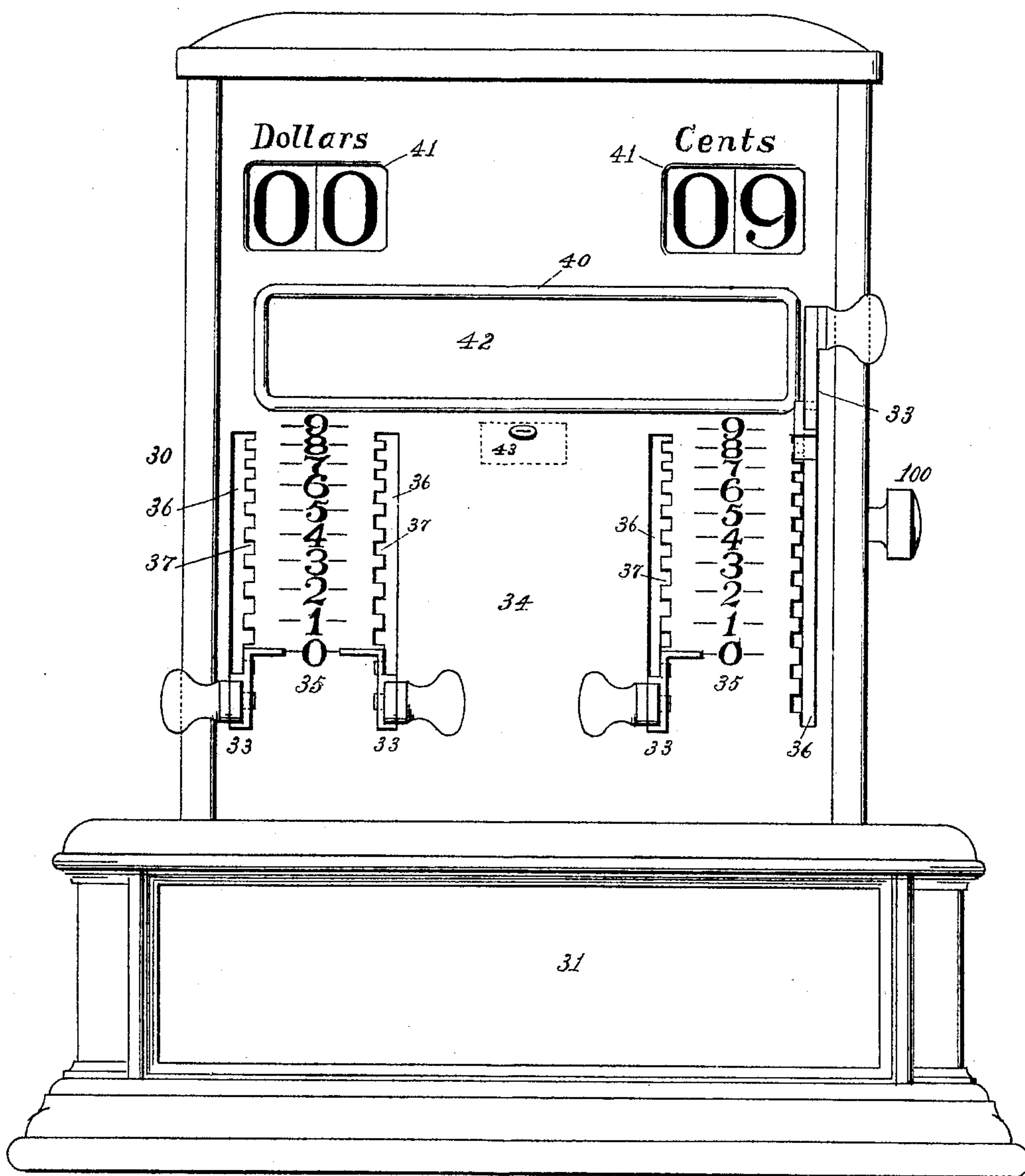
E. F. SPAULDING.
CASH REGISTER.

(No Model.)

(Application filed Nov. 22, 1897. Renewed Aug. 8, 1899.)

6 Sheets—Sheet 1.

Fig. 1.



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E. F. SPAULDING.

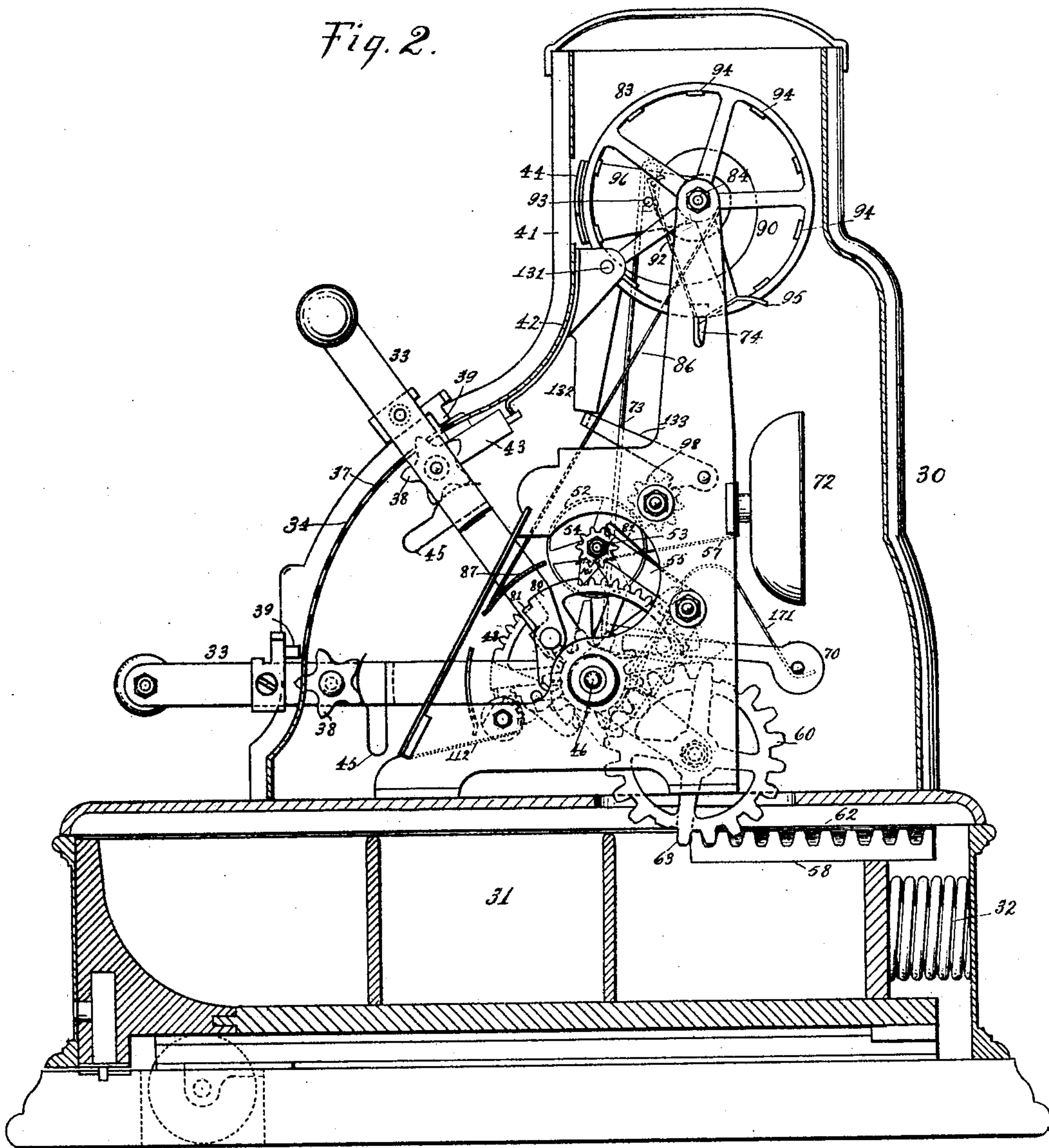
CASH REGISTER.

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(No Model.)

6 Sheets—Sheet 2.

Fig. 2.



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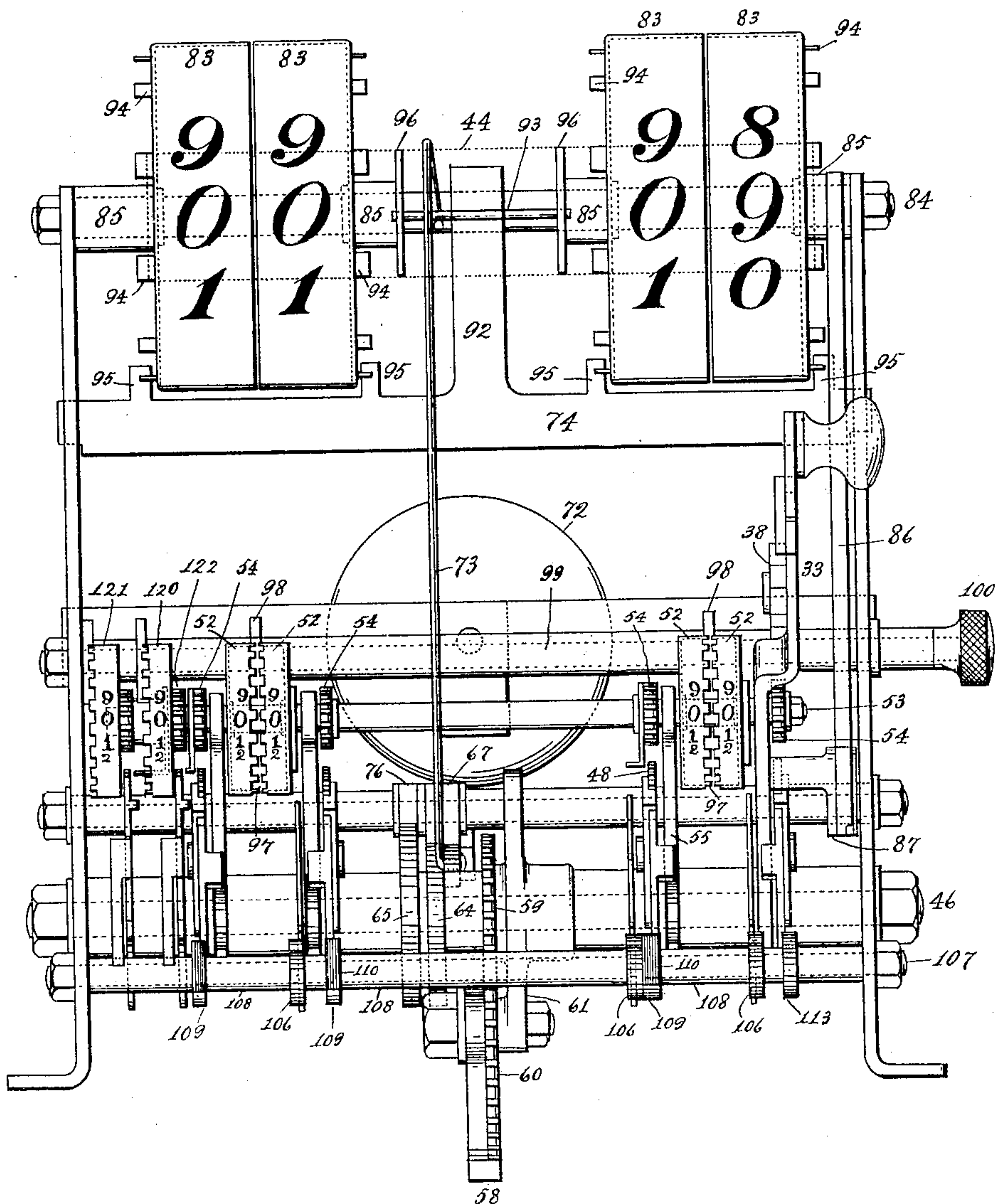
E. F. SPAULDING.
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6 Sheets—Sheet 3.

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Fig. 3.



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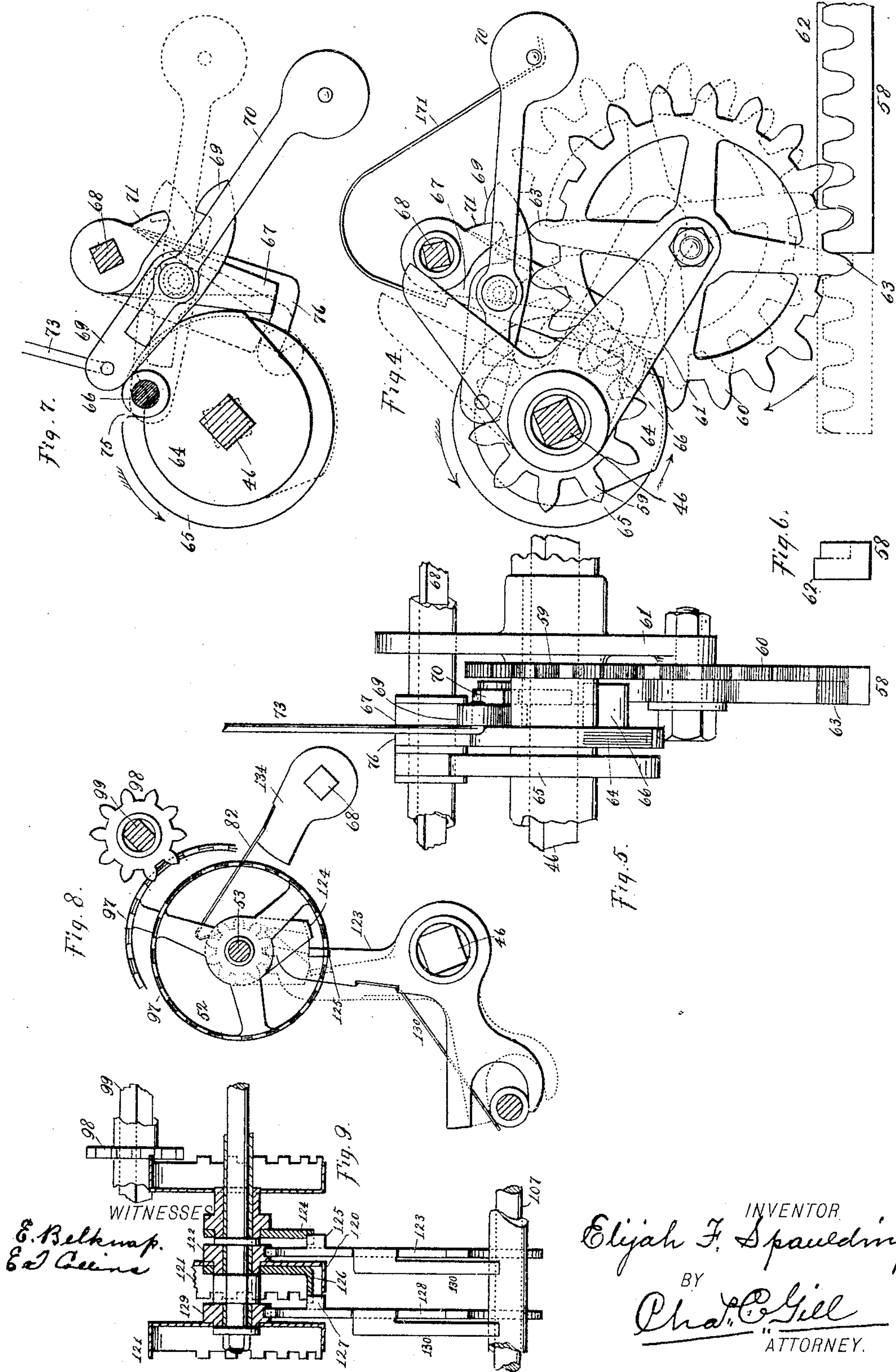
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6 Sheets—Sheet 4.



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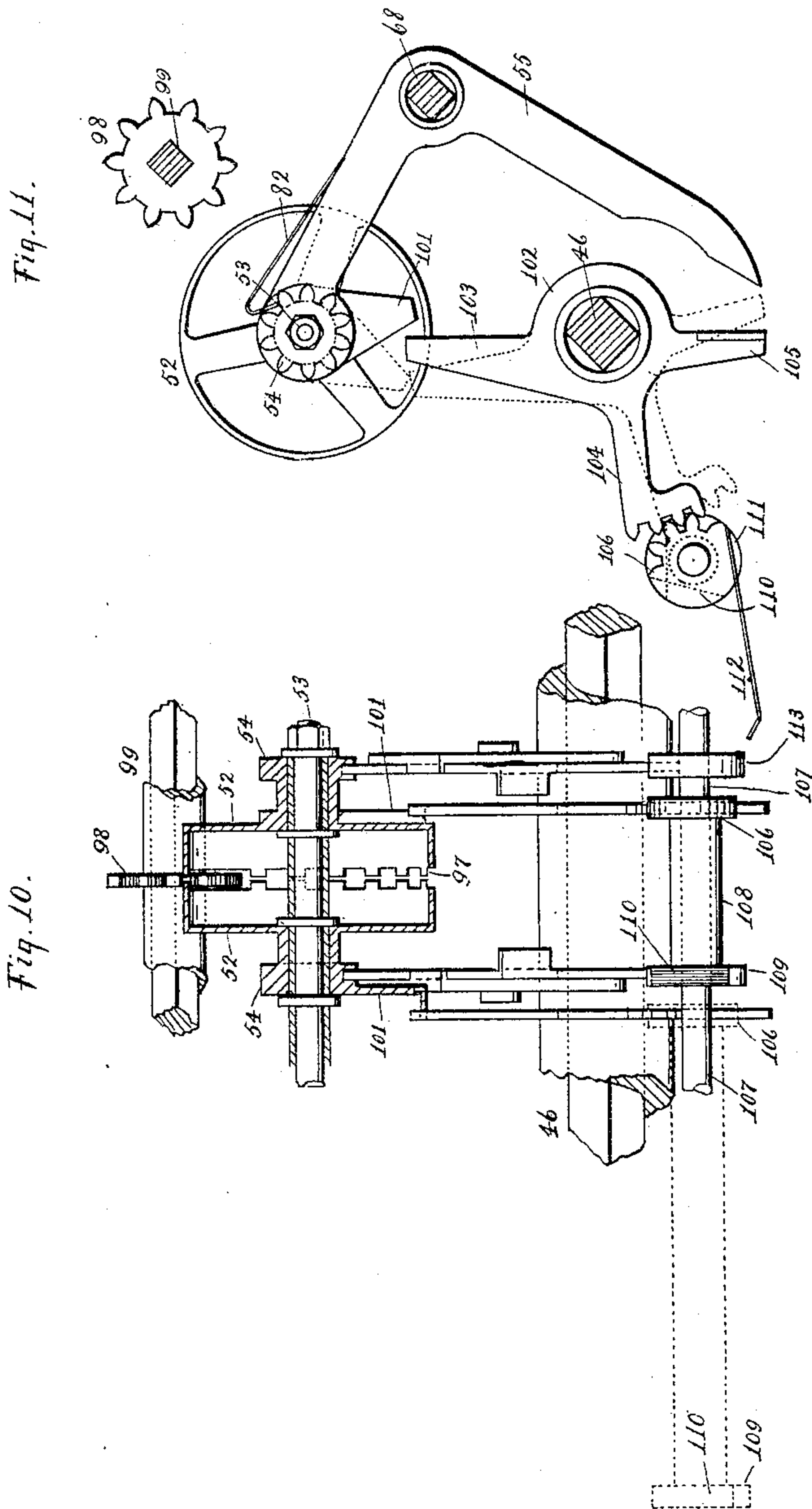
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E. F. SPAULDING.
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(Application filed Nov. 22, 1897. Renewed Aug. 8, 1899.)

6 Sheets—Sheet 5.

(No Model.)



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(No Model.)

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Fig. 13.

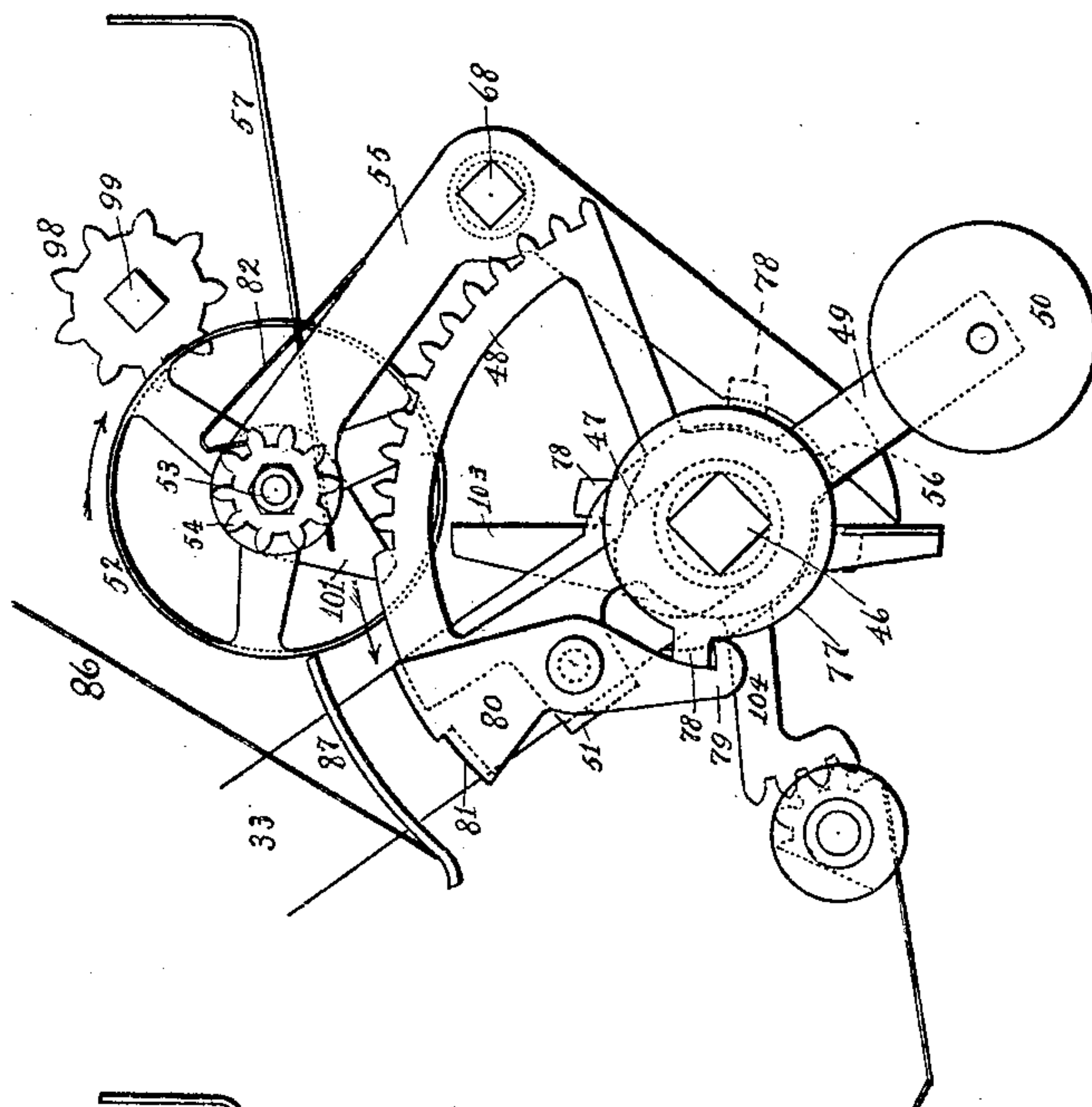


Fig. 12.

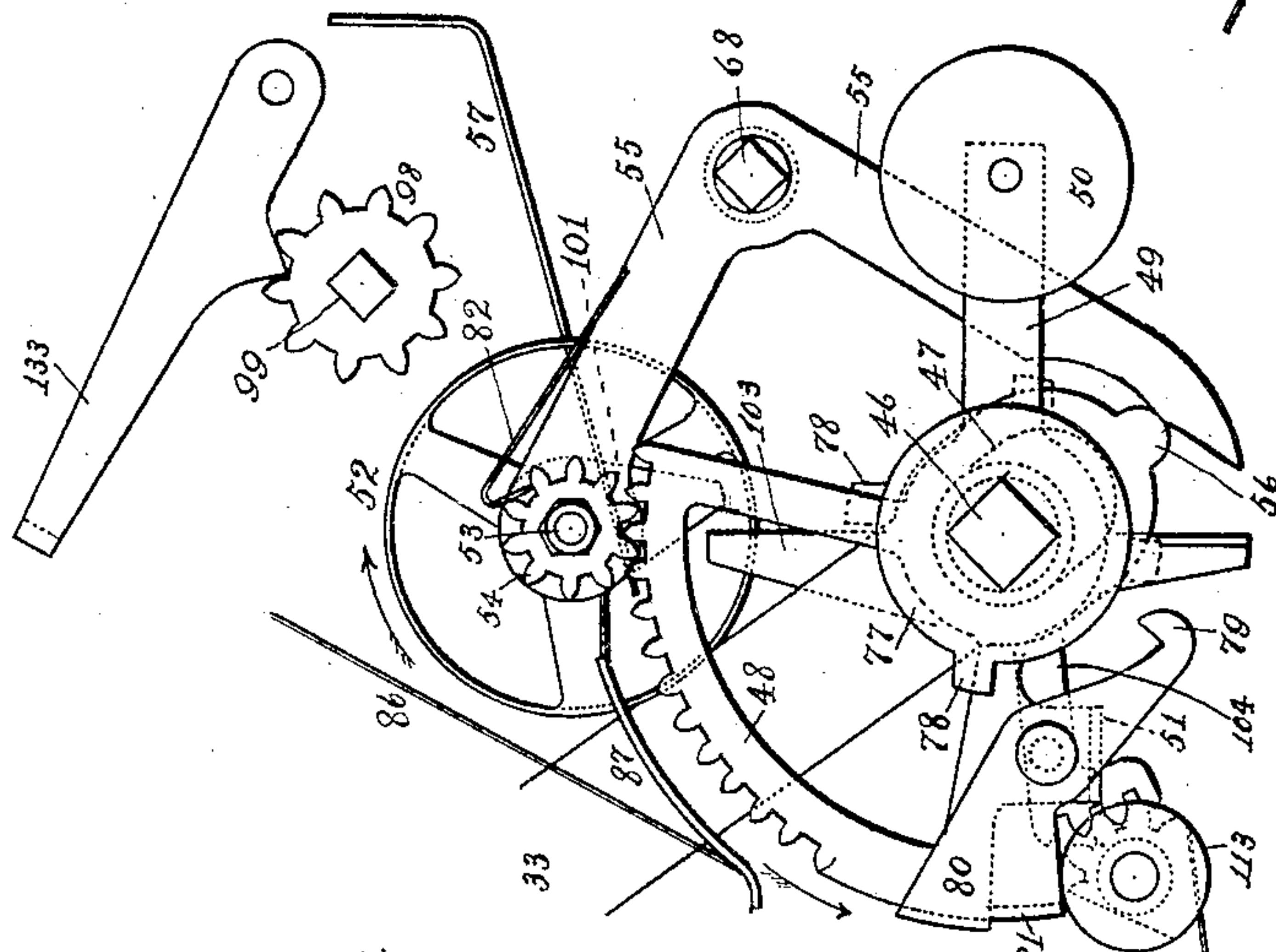


Fig. 15.

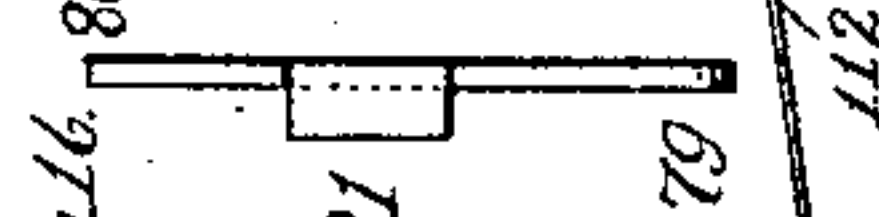
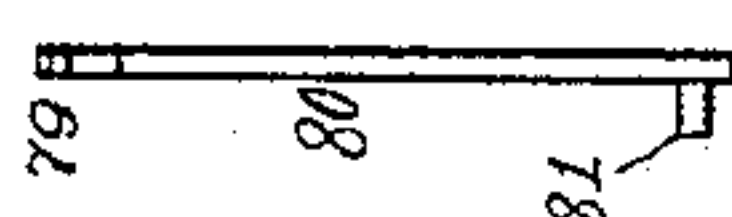
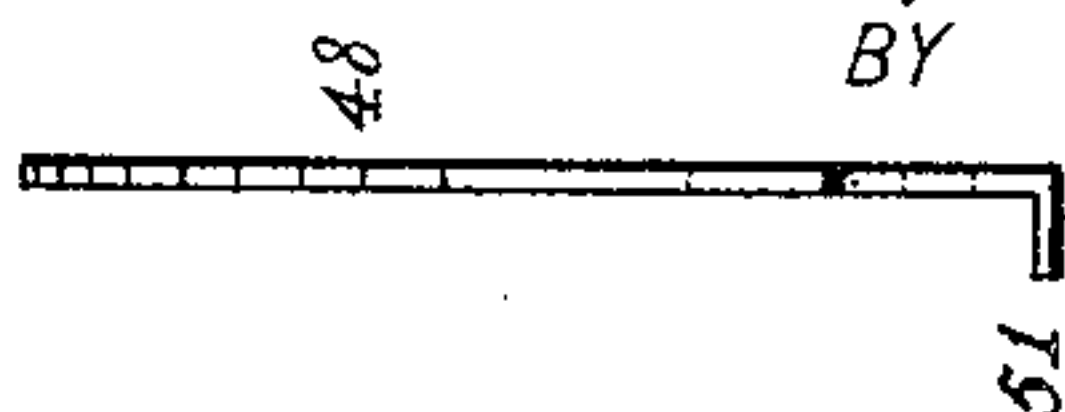


Fig. 14.



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UNITED STATES PATENT OFFICE.

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CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 640,966, dated January 9, 1900.

Application filed November 22, 1897. Renewed August 8, 1899. Serial No. 726,595. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH F. SPAULDING, a citizen of the United States, and a resident of Bound Brook, in the county of Somerset and State of New Jersey, have invented certain new and useful Improvements in Cash-Registers, of which the following is a specification.

The invention relates to improvements in cash-registers; and it consists in the novel features, structure, and combinations of parts hereinafter described and claimed.

In accordance with my present invention the operator moves the exposed actuating or setting levers along the lines of numerals provided upon the front face of the register-casing for the purpose of setting certain interior segments into proper operative relation to the registering mechanism, and thereafter the operator by moving all or any one of the actuating-levers directly inward places the registering mechanism into direct engagement with said segments and at the same time releases a spring in rear of the cash-drawer and enables the latter, through the connecting mechanism, to actuate the bell-hammer, to expose the indicating cylinders or drums, and to effect the movement of said segments against the registering mechanism, so that the registering cylinders or drums will revolve a distance sufficient for them to register the amount indicated upon the indicating cylinders or drums and also indicated by the position at which the actuating or setting levers were arrested along the columns of numerals provided, as aforesaid, upon the front face of the register-casing. The oscillating movement of the hand-levers sets the segments and also the indicating cylinders or drums, and the inward thrust of said levers, after having been brought to their proper position along the columns of numerals upon the front face of the register, releases the interior mechanism, so that the aforesaid spring may perform the full operation of opening the cash-drawer and effecting the proper registration.

The nature of the invention and a satisfactory means by which the invention may be carried into effect are described in full hereinafter and are illustrated in the accompany-

ing drawings, forming a part of this application, and in which—

Figure 1 is a front elevation of a cash-register constructed in accordance with and embodying the invention. Fig. 2 is a vertical section of same on the line of one of the actuating-levers. Fig. 3 is a front elevation of the register less the exterior casing and drawer, all but one of the actuating-levers being omitted. Fig. 4 is a detached vertical section through a portion of the register and illustrating more particularly the means for operating the interior mechanism of the register from the cash-drawer and during the outward motion of the latter. Fig. 5 is a front elevation of the mechanism illustrated in Fig. 4. Fig. 6 is a front end view of the rack connected with the cash-drawer and by which the gear-wheels shown in Figs. 4 and 5 are set in motion during the outward movement of said drawer. Fig. 7 is a vertical longitudinal section through a portion of the register and illustrates in side elevation portions of the interior mechanism presented in Fig. 4, but not sufficiently illustrated in said figure. Fig. 8 is a detached side elevation of one of the registering cylinders or drums with its coöperative mechanism. Fig. 9 is a central vertical transverse section of portions of the registering and totalizing cylinders or drums with the operative mechanism connected therewith. Fig. 10 is an enlarged front elevation, partly in section, of a pair of the registering cylinders or drums and the operative mechanism connected therewith. Fig. 11 is a side elevation, partly in section, of the registering and carrying mechanism. Figs. 12 and 13 are enlarged detached side elevations of portions of the interior mechanism of the register. These two figures illustrate like parts in their different positions. Figs. 14, 15, and 16 are detached edge views of certain detailed portions of the interior mechanism and will be hereinafter specifically referred to.

In the drawings, 30 denotes the exterior casing of the register; 31, the cash-drawer; 32, the spring which is compressed during the closing of the cash-drawer and drives said drawer to its open position upon the release of the same by the action of the actuating-

levers 33, and 34 indicates the front plate of the register, which plate is furnished with the series of numerals 35, ranging from "0" to "9" inclusive, and with the slots 36, located
 5 upon opposite sides of said series of numerals 35, as more clearly illustrated in Fig. 1. The slots 36 are provided to admit of the movement of the actuating-levers 33 along the sides of the columns of numerals 35, and said
 10 slots 36 are at one side formed with the series of notches 37 to be engaged by the teeth of the wheels 38 during the oscillating motions of the levers 33 and by the individual tooth 39, carried by each lever 33, when said levers
 15 or any of them are driven directly inward toward their shaft for the purpose of releasing the drawer 31 and permitting the spring 32 to drive the same to its open position. The toothed wheels 38 and individual teeth 39,
 20 carried by the levers 33, will be hereinafter more fully described in an appropriate place.

The cash-register casing 30 is provided above the slots 36 with the elongated opening 40 and above said elongated opening 40 with
 25 the openings 41, through which the indicator-drums may be observed by any person whose purchase is being registered by the machine. The elongated opening 40 is furnished with a door 42, which will be locked in its closed po-
 30 sition except when the owner of the machine may desire to inspect the registering-dials, at which time he will release the lock 43 and permit the door 42 to swing inward, whereupon he will be enabled to look through the elon-
 35 gated opening 40 and inspect the registering cylinders or drums. The openings 41 are provided with a shutter 44, which is adapted to close said openings 41, but which will remain in its open position from the time one pur-
 40 chase is registered by the machine until another purchase is to be registered and indicated by the machine. The shutter 44 will be fully described hereinafter.

The actuating levers 33 are in the present
 45 instance four in number, and each is provided within the register-casing with the toothed wheel 38 and without the register-casing with the individual tooth 39. Each of the levers 33 is provided with a spring 45,
 50 which is flexed against the toothed wheel 38 and prevents the latter from turning with undue freedom. The toothed wheel 38 will preferably be in the form of a five-pointed star, but may of course have an increased
 55 number of teeth. The levers 33 have an oscillating motion, by which the pointers thereof may be carried along the line of the columns of numerals 35, and they also are adapted to have a direct inward movement in the line
 60 of their length for the purpose of freeing the cash-drawer and permitting the interior mechanism of the register to operate. During the up-and-down or oscillating motion of the levers 33 the teeth of the wheels 38,
 65 carried by the levers, will travel along and enter the notches 37, provided at one side of the slots 36, and when the levers 33 are

pushed inward to release the cash-drawer the teeth of the wheels 38 will leave the notches 37, and simultaneously with the receding of
 70 the teeth of the wheels 38 from the notches 37 the individual tooth 39, carried by said levers, will enter said notches. The levers 33 are duplicates of one another, and each is provided with the wheel 38 and tooth 39, and
 75 any one of said levers may be operated to release the cash-drawer, and hence in usual practice although several of the levers 33 may be elevated, but one of them will be driven or pushed inward to release the cash-drawer.
 80 The wheels 38, carried by the levers 33, afford adequate resistance to the motion of the levers to enable the attendant to readily operate the said levers 33, and the individual teeth 39, carried by said levers, prevent any varia-
 85 tion in the position of the levers when the latter are moved inward and have been freed from the steadiness or rigidity imparted to them by the wheels 38. The wheels 38, the individual teeth 39, and the notches 37 in the
 90 front plate 34 constitute a part of the invention sought to be protected by this application.

The levers 33 extend outward from the shaft 46 and at their inner ends have the elongated opening 47, which permits of the inward-
 95 and-outward motion of said levers without affecting said shaft and also the free oscillating motion of said levers without turning said shaft. In Figs. 12 and 13 the elongated opening 47 at the inner ends of the levers 33 is
 100 clearly indicated by dotted lines, Fig. 13 denoting the normal or outward position of the lever 33 and Fig. 12 illustrating the said lever 33 in its inward position. The upward motion of the lever 33 operates to set the toothed seg-
 105 ments 48, which are free to have an oscillatory motion upon, but independent of, the shaft 46 and one of which is provided for each of the levers 33. The position of the segments 48 determines the extent of movement
 110 of the registering cylinders or drums, which are set in motion by the opening of the cash-drawer. In the present instance, there being four levers 33 employed, there are four of the segments 48 upon the shaft 46, one segment
 115 being adjacent to each lever 33. Each of the segments 48 is provided with an arm 49, carrying a weight 50, and during the upward movement of the levers 33 the weight 50 causes the segments 48 to follow upward with the le-
 120 ver 33, as indicated in Fig. 13. The downward movement of the lever 33 causes the segment 48 to turn downward; but during the upward movement of the lever 33 the weight 50 effects the upward movement of the seg-
 125 ment 48, the extent of the upward movement of the segment 48 being controlled absolutely by the lever 33. The segments 48 are duplicates of one another, and each is provided with a lip 51, which, as illustrated in Fig. 13,
 130 is adapted to press against the edge of the lever 33, and hence while the segment 48 is turning upward and rearward under the influence of the weight 50 the lip 51 on the seg-

ment will prevent the latter from moving upward and rearward to any greater extent than that permitted by the position of the lever 33.

Fig. 13 illustrates the correct position of the parts after the lever 33 has been moved upward and before said lever is pushed inward to release the cash-drawer and the mechanism operated therefrom. The upward movement of the lever 33, as illustrated in Fig. 13, sets the segment 48 to effect the proper rotation of the registering cylinders or drums 52, which are mounted to turn freely upon a shaft 53 and are connected with the pinion-wheels 54, also free to turn upon said shaft 53. Each registering cylinder or drum 52 is integral with or connected with a pinion-wheel 54, and each of the pinion-wheels 54 is adapted to mesh with its proper segment 48 upon the depression of the shaft 53 toward the segments 48. The shaft 53, carrying the registering cylinders or drums 52 and pinion-wheels 54, is mounted in the upper arms of the bell-crank levers 55, (see Figs. 12 and 13,) which bell-crank levers have their lower arms in near relation to the lower ends of the levers 33 and are operated to lower the shaft 53 by the inward thrust of said levers 33 against their lower arms. The lower ends of the levers 33, as clearly illustrated in Fig. 13, are provided with the studs or reduced ends 56, against which the lower ends of the bell-crank levers 55 are held in contact under the tension of the spring 57, which operates to normally hold the shaft 53 in its upward position, and consequently preserve the pinion-wheels 54 normally free from engagement with the segments 48. Upon the inward thrust of the levers 33, after said levers have been elevated to a proper position along their slots 36 in the face-plate of the register, said levers, as hereinbefore described, are pushed directly inward toward the shaft 46 in order to free the cash-drawer and effect the proper indicating and registering of the purchase. This inward thrust of the levers 33 results in the lower reduced end 56 of said levers or any one of them that may be thrust inward being driven against the lower arms of the bell-crank levers 55, whereby said levers are caused to turn and carry downward the shaft 53 until the pinions 54 on said shaft come into engagement with the teeth of the segment 48, which may be then in its upward position. After the segments 48 have been moved to their proper position and the lever 33 has been driven inward to lower the shaft 53 and bring the pinion-wheels 54 into engagement with the segments then elevated the following outward movement of the cash-drawer effects the rotation of the pinions 54 and registering cylinders or drums 52 through the means illustrated in Fig. 2 and on a larger scale in Figs. 4, 5, and 6. The inward motion of the lever 33 effects the release of the mechanism shown in Fig. 4, so that the rack 58 on the cash-drawer may set in motion the gearing illustrated in Figs. 4 and 5, in which

it will be seen that upon the shaft 46 is mounted the pinion-wheel 59, which is in constant engagement with the pinion-wheel 60, carried in the bell-crank-lever arm 61, hung from the said shaft 46. The pinion-wheel 60 during the outward motion of the cash-drawer is in mesh with the rack 58 on said drawer, and hence the outward motion of the cash-drawer under the action of the spring 32 causes a revolving motion in the pinion-wheel 60, and this motion is by said pinion-wheel 60 communicated to the pinion-wheel 59 and the parts connected therewith, as hereinafter described. During the inward motion of the cash-drawer the spring 32 is compressed and the tramway 62 along the side of said rack 58 engages a wider tooth 63 on the pinion 60 and prevents the regular teeth of said pinion 60 from engaging said rack 58. Hence during the inward motion of the cash-drawer the contact of the wider tooth 63 of the pinion-wheel 60 will result in said pinion-wheel being elevated to the position in which it is shown by dotted lines in Fig. 4, and thus the rack 58 will not at such time be able to effect any movement in the operative parts of the machine.

The devices which lock the cash-drawer through the intermediate operative mechanism and which are freed by the inward thrust of the lever 33 are probably more clearly illustrated in Figs. 4, 5, and 7, in which it will be seen that on the shaft 46 are secured the cam-plate 64 and notched plate 65, the former having the stop-pin 66, adapted to contact with the lower end of the arm 67, which is loose on the shaft 68, carrying the bell-crank levers 55, hereinbefore described. The stop-plate 67 is shown in its normal position in Fig. 4, directly over the stop-pin 66, carried by the cam-plate 64, and when said parts are in the position just referred to the plate 67, acting against the pin 66, will prevent the plate 64 and shaft 46 from rotating and hence the pinion-wheel 59 and pinion-wheel 60 will be held against movement until said arm 67 is withdrawn from above the said pin 66. The arm 67 has pivotally secured to it the hooked plate 69 and bell-hammer 70, and the shaft 68 has keyed upon it the dog 71, which is normally in engagement with the hooked end of said plate 69, as shown in Fig. 4 by full lines and in Fig. 7 by dotted lines. The downward movement of the bell-crank levers 55 to carry the pinion-wheels 54 against the then elevated segments 48 operates to turn the shaft 68 and move the end of the dog 71 rearward, and this enables the dog 71, through the medium of the hooked plate 69, to withdraw the plate 67 from over the pin 66, thus freeing the shaft 46 and enabling the rack 58 on the cash-drawer, through the medium of the pinion-wheels 60 and 59, to effect one complete revolution of the said shaft 46. In Fig. 7 the cam-plate 64, having the stop-pin 66, is shown as having started upward on its movement, and thus the pin

66 is shown at a higher elevation than the lower end of the stop-plate 67. The pin 66 during its upward movement from the stop-plate 67 contacts with the short end of the bell-hammer rod 70 and elevates the same, and thereby depresses the hammer from the position in which it is shown by dotted lines in Fig. 7 to that in which it is shown by full lines in said figure against the stress of the spring 171, which after the pin 66 has passed beyond the short end of the bell-hammer rod quickly elevates said hammer and causes the latter to strike the gong 72, thereby directing the attention of the customer to the register.

The hooked plate 69 has connected with its rear end the upwardly-extending rod 73, which, as illustrated in Figs. 2 and 3 and as hereinafter more fully described, is connected with the shutter 44, which is normally closed, but is opened by the upward movement of the rod 73 during the one revolution of the cam-plate 64 on the shaft 46. The upward movement of the rod 73 elevates the shutter 44, and the shutter is then held in its elevated position by means of a plate 74 while the rod 73 descends, the upper end of said rod having an elongated opening at its connection with the shutter 44 in order that it (said rod 73) may descend while the shutter remains elevated. The shutter 44 and its connections will be more fully described hereinafter. Upon the shaft 46 and adjacent to the cam-plate 64 thereof is secured the plate 65, which is provided with a notch 75 in its periphery and coöperates with the hook 76, rigid on the shaft 68. The lower end or point of the hook 76 is adapted to enter the notch 75 and lock the plate 65 in stationary position at the end of each revolution of said plate. The downward carrying of the shaft 53 by the bell-crank levers 55 results in said levers 55 turning the shaft 68 downward and rearward, and since said hook 76 is rigid with said shaft said hook will during the motion of the said bell-crank levers 55 be turned rearward from the notch 75 of said plate 65 into the position shown by full lines in Fig. 7. The notch 75 in the plate 65 normally receives the point of the hook 76, and said notch 75 is in line with the pin 66, carried by the hooked plate 64, and thus the withdrawal of the hook 76 from the notch 75 and the stop-plate 67 from the pin 66 occurs simultaneously, and thereby the shaft 46 is left entirely free to be turned under the action of the pinion-wheel 59. The main purpose, however, of the plate or disk 65 and hook 76 is during the rotation of the shaft 46 to hold the shaft 68 against turning, and consequently to prevent the shaft 53 and bell-crank levers 55 from moving while the shaft 46 is making its revolution to effect the registration. During the revolution of the shaft 46 and plate 65 the smooth edge of the latter rides against the point of the hook 76, and thus holds the shaft 68 stationary. When the notch 75 reaches the point of the hook

76, the spring 59 causes said point to enter the said notch and the shaft 53 to elevate.

The freeing of the cash-drawer by the inward thrust of the lever 33 is thus accomplished by the action of the bell-crank levers 55 in turning the shaft 68, so that said shaft will of itself free the hook 76 from the notched plate 65 and will through the dog 71 pull on the hooked plate 69, and thus free the plate 67 from the stop-pin 66. It will be remembered that the levers 33 are not thrust inward until they have first been moved upward along their slots 36 and have permitted the weights 50 to turn the segments 48 upward a distance corresponding with that given to the levers 33. After the levers 33 have been elevated and thrust inward to move the bell-crank levers 55 for the purpose of engaging the pinion-wheels 54 with the segments 48 and releasing the locking devices (shown in Fig. 5) the spring 32 will drive the cash-drawer 31, and more particularly the rack 58, outward, and said rack will turn the gear-wheels 60 and 59 and, through the shaft 46 and plates 77, (see Figs. 12 and 13,) cause the segments 48 to return to their normal or forward position, whereby the teeth of said segments are carried against the teeth of the pinion-wheels 54, and the latter, with the registering cylinders or drums 52, are revolved a distance controlled by the extent to which the segments 48 are carried against said pinion-wheels 54. If the segments 54 were moved upward a distance of nine teeth, as illustrated in Fig. 13, their subsequent forward movement to their normal position would move the pinion-wheel 54 nine teeth, and consequently cause the registering cylinder or drum 52, connected with said pinion, to move, say, from "0" to "9." The segments 48 are thus moved upward a distance governed by the amount to be registered, and they are set into the proper position by means of the levers 33, which prevent said segments from passing upward beyond the point desired for them. The plates 77 are rigid with the shaft 46, and one plate is provided for each segment 48, and each plate 77 is furnished with a projection 78, which, as illustrated in Fig. 13, is adapted to engage the hooked end 79 of the plate 80, which is pivotally secured to and carried by the segment 48. The shaft 46 always makes one complete revolution, and hence the plates 77 will always make a complete revolution from the position in which they are shown in Fig. 12 back to that position. Thus with every opening of the cash-drawer the plates 77 will make a complete revolution, turning downward and toward the rear, and the projections 78 on said plates 77 will catch the hooked end 79 of the plates 80 and pull the segments 48 forward and downward to their normal position, upon reaching which, in view of the pivotal nature of the plates 80, the projections 78 on the plates 77 will leave the hooked ends 79 of said plates 80 and continue on their movement without

further affecting the segments 48. As above described, each lever 33 coöperates with one segment 48, and it is to be understood that each segment 48 is provided with one plate 80 and coöperates with one plate 77. The pivoted plates 80 are clearly illustrated in Figs. 12, 13, 15, and 16. In Fig. 15 the pointed end 79 of the plate 80 is illustrated as uppermost, while at the lower end of Fig. 15 is seen a flange 81, extending from said plate 80. This flange 81 is clearly shown in Fig. 16, which is an edge view projected to the left from Fig. 12 of the said plate. Fig. 14 is an edge view of one segment 48 and illustrates the flange 51, which follows against the lever 33. The flange 81 on the plate 80 passes over a portion of the periphery of the segment 48 and abuts against a shoulder formed on said periphery, as indicated by dotted lines in Figs. 12 and 13. The plates 77 on the shaft 46 will be so set that the projections 78 on said plates will be at right angles to one another, as indicated by the full and dotted lines, respectively, in Figs. 12 and 13, and the purpose of thus disposing the projections 78 is to cause them to one after another move the segments 48 in lieu of moving all of said segments 48 simultaneously. Any one of the levers 33 may be moved to effect the registering on its own special registering cylinder or drum. The movement of the registering cylinders or drums 52 is thus consummated by the forward and downward motion of the segments 48 against the pinions 54, connected with said cylinders or drums.

The means for carrying from one registering cylinder or drum 52 to another and the means for totalizing the amounts registered will be hereinafter described.

In the description above presented it has been attempted to explain the means for imparting the proper graduated movements to the series of registering-drums from the force opening the cash-drawer. It has been described that the segments 48 determine, according to their position, the distance the registering cylinders or drums 52 shall rotate and that said segments are set by the upward motion of the levers 33, which when moved upward permit the segments 48 to follow them. The segments 48 are thus set in proper relative position to effect the proper registration by means of the levers 33, and then the inward thrust of any one of the levers 33, acting through its bell-crank lever 55, lowers the shaft of the registering cylinders or drums 52, so that all of the pinions 54 connected with said registering cylinders or drums 52 will engage all of the then elevated segments 48. As described above, the inward thrust of the levers 33, or any one of them, after having arrived at the upward position thereof effects, through the bell-crank levers 55, the release of the stop-plate 67 from the stop-pin 66 and the hook 76 from the notch 75, and that thereby the train of mechanism intermediate the spring 32 (in rear of the cash-drawer)

and segments 48 are thus put into operative relation, so that the outward force of the spring 32, acting through the rack 58, pinion 60, and pinion 59, may cause the plates 77 on the shaft 46 to engage the plates 80, carried by the segments 48, and pull said segments forward and downward to their former normal position, the teeth of the segments 48 being during such movement carried against the pinions 54, connected with the registering cylinders or drums 52, to effect the proper extent of rotation of the latter. The spring 57 (shown in Figs. 12 and 13) imparts a normal upward tension to the shaft 53, carrying the pinions 54, and registering cylinders or drums 52 and springs 82, flexed against the pinion-wheels 54, as shown in Figs. 12 and 13, prevent any excessive movement of said pinion-wheels or registering cylinders or drums 52.

The indicating is performed upon the series of rotary cylinders or drums 83, mounted in the upper part of the exterior casing 30. The cylinders or drums 83 have upon their periphery the numerals ranging from "0" to "9," inclusive, and each is capable of independent rotation upon the shaft 84, supporting them. Each of the cylinders or drums 83 has at one side a sleeve 85, and both the drum and sleeve are loosely mounted upon the shaft 84. In the present instance there are four of the indicating cylinders or drums 83, and each one is through its sleeve 85 and a flexible band 86 connected with its own special actuating or setting lever 33. In Fig. 3 I illustrate the first or units-of-cents lever 33, connected by the band 86 with the first or units-of-cents cylinder or drum 83, but omit to duplicate in said Fig. 3 the band 86, so as not to complicate or render indistinct the illustration. Each lever 33 is provided with a plate 87, of segmental shape, to which the lower end of the band 86 is secured. When all of the levers 33 are in their lower normal position, the cylinders or drums 83 will be at zero; but when said levers 33 are raised the springs 90 will by reason of the slackening of the bands 86 cause said cylinders or drums 83 to turn a distance proportioned to the extent to which the levers 33 are elevated. Thus if the first right-hand lever 33 should be elevated along its slot 36 until it reached and was arrested at the numeral "9" in the right-hand column of figures 35 on the face-plate of the register the right-hand cylinder or drum 83 would by means of its spring 90 turn a sufficient distance to bring the numeral "9" thereon in line with the opening 41 in the upper front part of the register-casing. The cylinders or drums 83 turn upon and not with the shaft 84, and hence said cylinders or drums 83 may be independently operated by the levers 33. The shutter 44 retains the openings 41 in the face of the register normally closed; but between sales said shutter 44 is retained in its elevated position—that is to say, after one sale is indicated at the opening 41 the shutter

will remain in its elevated position until another sale is to be registered and indicated. The raising of the shutter 44 is accomplished by the rod 73, connected with the hooked plate 69, which is moved upward by the pin 66 on the plate 64, (shown in Fig. 7,) and is then held in its upward position after said pin 66 leaves the said hooked plate 69 and allows the rod 73 to descend by means of the plate 74, which at its center, as shown in Figs. 2 and 3, has the arm 92, which tilts below the connecting-rod 93, forming a part of said shutter 44. The plate 74 is shown in front elevation in Fig. 3, and said plate at its ends is loosely mounted, so that said plate and its center arm 92 may tilt normally forward and thereafter at the proper time be moved rearward. When the rod 73 ascends to elevate the shutter 44 above the openings 41, the connecting-rod 93, forming a part of the shutter, simply brushes against the upper end of the center arm 92 of the plate 74 and tilts said arm and plate rearward, and thereupon as soon as the connecting-rod 93 has passed upward above said center arm 92 the latter will tilt forward below said connecting-rod 93 and hold said rod and said shutter 44 in their upward position. Thus when the setting or actuating levers 33 are elevated the indicating cylinders or drums 83 will be turned behind the closed shutter 44 by the springs 90, and thereupon when the said setting or actuating levers 33 are pushed inward to release the operative mechanism and the cash-drawer the rod 73 will at once elevate the shutter 44, and the central arm 92 of the tilting plate 74 will maintain said shutter in its upward position while the arm 73 returns to its lower position. After the shutter 44 has been raised to expose the indicating cylinders or drums 83 it will remain in its elevated position until by the action of the setting or actuating levers 33 said cylinders, or some of them, are moved, and upon this taking place the plate 74 will be turned rearward, so that the upper end of the arm 92 of said plate 74 will leave the connecting-rod 93 and permit said rod, with the shutter 44, to fall to its lower normal position in rear of the openings 41. The tilting of the plate 74 by means of the indicating cylinders or drums 83 is accomplished by the projections or fingers 94, forming a part of said cylinders or drums, coming into contact with the fingers 95, forming a part of the plate 74. Each cylinder or drum 83 is provided with the series of fingers 94, one finger 94 being provided for each numeral on each of the said cylinders or drums. The plate 74 is provided with four of the fingers 95, one being arranged for each of the cylinders or drums 83, and hence upon the turning of any one of the cylinders or drums 83 a distance equal to one of the numerals thereon the plate 74 will be tilted to lower the shutter 44, which will remain in its lower position until the actuating-lever 33, being operated, is thrust inward

to release the mechanism and permit the rod 73 to again elevate the shutter. The shutter 44 is simply a segmental plate of the outline in cross-section indicated in Fig. 2 and secured upon plates 96 96, (shown in Fig. 3,) which radiate from the shaft 84 and are loosely mounted on said shaft. The shutter 44 is of elongated shape and is indicated by dotted lines in Fig. 3. The radiating plates 96 96, carrying the shutter 44, are connected together by the rod 93, which, as above described, is acted upon by the rod 73 to effect the elevation of the shutter 44 and by the upper end of the center arm 92 of the plate 74 for maintaining the said shutter in its upper position.

The plate 74 is loosely mounted at its ends in the opposite sides of the supporting-frame, and the center arm 92 of the plate 74 normally tilts forward, as illustrated by the dotted lines in Fig. 2. The fingers 95 on the plate 74 are shown in Fig. 3, and said fingers extend rearward on an inclined line, as illustrated in Fig. 2.

The cylinders or drums 83 are employed solely for indicating the amount of the individual purchase, and said cylinders or drums 83 are moved to their indicating position by the springs 90 during the upward movement of the actuating or setting levers 33 and while the shutter 44 is in its downward position closing the openings 41. The shutter 44 is elevated and held in its elevated position by the inward thrust of the setting or actuating lever or levers 33, the rod 73 elevating said shutter 44 and the plate 74 through its center arm 92 supporting said shutter. Any subsequent movement of any of the indicating cylinders or drums 83 results in the projections 94 on said cylinders or drums contacting with one or more of the fingers 95 on the plate 74 and tilting the center arm 92 of said plate 74 rearward from below the connecting-rod 93 of the shutter 44 and permitting said shutter thus unsupported to fall to its lower or closed position. (Illustrated in Fig. 2.) In the description hereinbefore presented the registering cylinders or drums 52 have been referred to as being carried by the shaft 53 and actuated by the movement of the segments 48 against the pinions 53, connected with said registering cylinders or drums 52; but the special construction of said registering cylinders or drums 52 and the means for carrying from one to the other of said cylinders or drums 52 have not been hereinbefore described and the description of the same will now be given.

The cylinders or drums 52 are in their outline illustrated in Figs. 10, 11, 12, and 13, and in their relation to one another upon the shaft 53 are illustrated in Fig. 3. The exterior surfaces of the cylinders or drums 52 correspond with one another, and each bears its own series of numerals, running from "0" to "9," inclusive. Each of the cylinders or drums 52 has upon each edge the series of teeth 97, and said drums or cylinders 52 are preferably so

placed that their toothed edges come together in pairs, as shown in Fig. 3, in order that the resetting pinion-wheels 98 may each engage a pair of the cylinders or drums 52, thus making two pinion-wheels 98 serve for the four registering cylinders or drums 52. The teeth 97 do not extend entirely around the cylinders or drums 52; but, as indicated in Figs. 9 and 10, one tooth is omitted from each cylinder or drum 52 in order that a point will be arrived at during the revolution of the pinions 98 at which said pinions will cease to affect said cylinders or drums. The means for resetting the cylinders or drums 52 consists of the pinions 98 and the shaft 99, upon which said pinions are mounted and which is provided exterior to the register-casing with the knob or handle 100, by which it may be conveniently turned. The means for resetting the cylinders or drums 52 will be hereinafter referred to more fully, it being intended here to point out the means for carrying from one of the registering cylinders or drums to another. It will be understood from the foregoing description that the distance to which the registering cylinders or drums 52 are turned is determined by the position of the segments 48 with respect to the pinion-wheels 54, carried by said cylinders or drums, and that the position of the segments 48 is controlled by the position of the setting or actuating levers 33. If we take as an example the condition of the apparatus shown in Fig. 13, it will be understood that the setting or actuating lever 33 has been turned upward to indicate on the first right-hand cylinder or drum 83 the numeral "9," denoting nine cents as the purchase, and that the segment 48, owing to its weight 50, has followed the lever upward until nine teeth of the segment are at the right of the pinion-wheel 54, directly over it. The inward thrust of the lever 33 against the bell-crank lever 55 thence pulls the shaft 53, carrying the pinion-wheels 54 and drums 52 to their lower position against said segment 48, whereupon the shaft 46 is rotated, as hereinbefore described, and the plate 77 immediately makes a complete revolution, causing its projection or finger 78 to engage the hook 79 of the plate 80, as shown in Fig. 13, and to pull the segment 48 forward and downward to the position in which it is shown in Fig. 12, this having caused nine teeth of the segment 48 to act upon the aforesaid pinion 54 and to turn said pinion 54 and registering cylinder or drum 52 a distance equal to nine teeth or points, thus causing the cylinder or drum 52 to move from "0" to "9." The subsequent operations of the first right-hand lever 33 must necessarily result in the carrying from the first right-hand cylinder or drum 52 to the second right-hand cylinder or drum 52 and so on through the series, and this carrying is performed by the mechanism probably more clearly illustrated in Figs. 11, 12, and 13, in which it will be seen that upon the shaft 53, carrying the pin-

ions 54 and registering cylinders or drums 52, are the arms 101, which are rigid with the drums and three of which are employed, one for each of the three right-hand registering cylinders or drums 52. With each revolution of any one of the drums 52 its arm 101 makes a complete revolution, and this revolution is utilized to effect the carrying from one cylinder or drum to another. Directly below the shaft 53 and loosely mounted upon the shaft 46 are the series of three-armed levers 102, four of these levers being employed, one for each of the cylinders or drums 52. With each revolution of a cylinder or drum 52 its arm 101 will contact with the upper arm 103 of said lever 102 and cause said lever 102 to have an axial motion upon the shaft 46 equal to the distance of one tooth of any one of the pinion-wheels 54. The forwardly-projecting arm 104 of the three-armed lever 102 is provided with a short segment, and the lower arm 105 of said lever 102 is in convenient position to be acted upon by the lower arm of the bell-crank lever 55. It may here be said that the upper arm 103 of the three-armed lever 102 will by the contact therewith of the arm 101 on the drum 52 be moved so as to rock the lever 102 to the position indicated by dotted lines in Fig. 11, and that this action invariably occurs while the shaft 53, carrying the drums 52, is in its lower position, (shown in Figs. 11 and 12,) and that during the return of the shaft 53 and bell-crank levers 55 to their upper or normal position (shown in Fig. 13) the lower arm of said bell-crank lever will contact with the lower arm 105 of the three-armed lever 102 and restore the latter to its normal position, (shown by solid lines in Fig. 11,) in which position it may be acted upon by the arm 101 upon the next complete revolution of the cylinder or drum 52. The short segment carried by the arms 104 of the three-armed levers 102 engages the gear-wheels 106, mounted to turn upon but not with the shaft 107, and the movement of said segments on said arm 104 is never greater than a distance equal to one tooth of the pinion-wheels 54, or, in other words, never greater than to effect just the movement in the drums 52 that may be necessary for moving said drums a distance equal to the space between two of the numerals thereon. The pinion-wheels 106 are three in number, one being for each lever 102, and, as more clearly illustrated in Figs. 3 and 10, each pinion-wheel 106 is connected by a sleeve 108 with an adjacent plate 109, having, as indicated by the dotted lines in Figs. 11, 12, and 13, a flattened surface 110 and no teeth. The pinion-wheels 106 are in the nature of segments, since they only have a few teeth, and each is provided with a flattened surface 111 simply for the contact of the springs 112, which hold said pinions 106 and disks 109 steady and, through the segments on the arms 104 hold and steady the three-armed levers 102. At the right-hand end of the shaft 107 there is a disk 113,

whose outline is a true circle and which is illustrated by the full lines in Figs. 12 and 13. This disk 113 differs from the disks 109 in that its outline is a true circle, while the disks 109 have the flattened surfaces 110, and the reason for the difference in the outline of the disks 113 and 109 is that the disk 113 forms the stop for the right-hand plate 80, carried on the segment 48, and that no carrying is done to the first registering-drum 52, but from said drum to the other drums in series. The disk 113 at the right-hand end of the shaft 107 thus operates as an invariable stop for the pivoted plate 80, carried by the right-hand segment 48. If it were not for the disk 113 or other convenient stop, the projection 78 on the right-hand plate 77 after engaging the hook 79 of said plate 80, as shown in Fig. 13, might not be able to release itself from the said hook, but with the stop 113 in position to contact with the outer portion of said plate 80 the inner or hooked end of said plate 80 is turned outward from said projection 78 on said plate 77, and thus said projection 78 is freed of the hook 79 and may continue on its revolution without affecting the plate 80. When the plate 77, having the projection 78, first takes hold of the hook 79 of the plate 80, as shown in Fig. 13, the upper shoulder 81 of said plate 80 is slightly removed from the end of the segment 48, as indicated by the dotted lines in Fig. 13, and hence when said plate 80 and segment 48 are drawn forward and downward by the revolving action of the plate 77 the plate 80 will contact with the disk or stop 113 and be thereby arrested, while the slight continued pull upon the hook 79 by the projection 78 during the freeing of the latter from said hook will bring the segment 48 against the lip or shoulder 81 on said plate 80, as illustrated in Fig. 12. The plate 80 and segment 48 at the right-hand end of the machine thus have an invariable movement, the disk 113 having a uniform outline and never varying its relation to said plate 80 and segment 48. This invariable movement of the plate 80 and segment 48 at the right-hand side of the machine is provided, since there never is any carrying to the first right-hand registering cylinder or drum 52, but from said cylinder or drum to the other cylinders or drums 52 in series. The other plates 109, provided as stops for the plates 80 and segments 48 to the left of the units of cents-actuating lever 33, have the flattened surfaces 110 in order that the plates 80 and segments 48 to the left of the first plate 80 and segment 48 may have a more extended downward movement than the right-hand segment 48 and its plate 80. When in their normal position, the disks 109 have their flattened surfaces 110 turned to the position in which they are illustrated by the dotted lines in Figs. 11 to 13, inclusive; but, for instance, after the first right-hand drum 52 has been moved to make a complete revolution its arm 101, contacting with

the upper arm 103 of the three-armed lever 102, will move the segment on the arm 101 downward against the pinion-wheel 106, and thereby through the sleeve 108 turn the adjoining disk 109, so that its flat surface 110 will appear uppermost. The flat surface 110 of the disk 109 will only be turned uppermost upon a complete revolution of the shaft 53 and arm 101, and hence said flat portion 110 will only be turned uppermost when it is necessary to carry from the first right-hand cylinder or drum 52 to the next cylinder or drum 52, and so on through the series. When the flat surface 110 of the disk 109 has been turned uppermost, it will allow the plate 80 of the second right-hand segment 48 to pass downward below its usually normal position to an extent equal to one tooth of the pinion-wheels 54, and hence if the said segment 48, carrying the said plate 80, is, for instance, at its normal position, at which "0" would be indicated on the second drum from the right, numbered 52, the weighted outer end of the said second plate 80 would descend to the flattened surface 110 of the said disk 109, and thus the hooked end 79 of said plate 80 would turn inward sufficiently to be caught by the projection 78 on the second plate 77 during the revolution of the shaft 46, and hence during the revolution of said shaft 46 the said projection 78 on the second plate 77 would catch the hook 79 of the second plate 80 and pull said plate and the segment 48 connected with it a distance equal to one tooth of the pinion-wheel 54, the result of which would be that the said second segment 48 would turn this pinion-wheel 54 one notch and effect the movement of the second registering cylinder or drum 52 a distance equal to one point or from "0" to "1," whereby the tens of cents would be carried to the second registering cylinder or drum 52. Until the first registering cylinder or drum 52, with its shaft 53, has made a complete revolution the three-armed lever 102 will remain at rest and the flattened surface 110 of the disk 109 will not be moved upward, and hence until more than nine cents has been registered the second drum 52 will remain at rest and the second plate 77 from the right-hand end of the shaft 46 will be unable to affect the plate 80, carried by the second segment 48. The plate 109 for the second segment 48 and its plate 80 is connected by the sleeve 108 with the pinion 106 and will have no movement until said pinion actuates it, and said pinion 106 is only actuated to turn the flattened surface 110 of the disk 109 upward by the movement of the lever 102. After the second registering cylinder or drum 52 has been moved to carry the tens of cents from the first right-hand cylinder or drum 52 the shaft 53, as above described, elevates under the action of the spring 57, and this causes the lower arm of the bell-crank lever 55 to press against the lower arm 105 of the three-armed lever 102 and restore said lever

to its normal position, (shown by full lines in Fig. 11,) whereby the segment on the arm 104 of said lever 102 is caused to impart a reverse motion to the pinion 106, sleeve 108, and disk 109, restoring the flat surface 110 of the latter to its normal position. (Indicated by the dotted lines in Fig. 11.) The carrying from the second right-hand cylinder or drum 52 to the other cylinders or drums 52 in series is accomplished by means similar to that above described for carrying from the first right-hand cylinder or drum 52 to the second right-hand cylinder or drum 52, and hence upon the shaft 107 between the tens-of-cents cylinder or drum 52 and the units-of-dollars cylinder or drum 52 is, as shown in Fig. 3 and as indicated by the dotted lines in Fig. 10, arranged the further sleeve 108, having upon its right-hand end the further pinion-wheel 106 and upon its left-hand end the disk 109, having a flattened surface at one side corresponding with the flat surface of the first right-hand disk 109. The pinion-wheel 106 at the right of the tens-of-cents drum 52 is engaged by the segment of a three-armed lever 102 exactly corresponding with the lever 102, (shown in Fig. 11,) and the disk 109, connected with said pinion 106, operates as a stop and to accomplish the same function exactly as the first right-hand disk 109. (Shown in Fig. 10.) The carrying from the units-of-dollars cylinder or drum 52 to the tens-of-dollars cylinder or drum 52 is accomplished by means which are a duplicate of the means shown in Figs. 10 and 11 for carrying from the units-of-cents to the tens-of-cents cylinder or drum 52.

In the cash-register presented are provided the totalizing cylinders or drums 120 and 121. (Shown in Fig. 3 and on a larger scale in Figs. 8 and 9.) The cylinder or drum 120 turns a distance equal to one tooth with each complete revolution of the tens-of-dollars cylinder or drum adjoining it, and the cylinder or drum 121 turns a distance equal to one tooth with every complete revolution of the drum 120. The shaft 53 carries the drums 120 and 121, and the drum 120 is provided with the pinion-wheel 122, which is in engagement with the upper toothed end of the bell-crank lever 123, (shown in Fig. 8,) and to the tens-of-dollars cylinder or drum 52 is connected the arm 124, which, with each revolution of said tens-of-dollars cylinder or drum 52, makes a complete revolution and contacts with the lip 125 on the said bell-crank lever 123 and causes said lever through its toothed upper end to move the pinion-wheel 122 and cylinder or drum 120 a distance equal to one tooth of said pinion-wheel 122, thus carrying to the cylinder 120 with each complete revolution of the tens-of-dollars cylinder or drum 52. The cylinder or drum 120 has an arm 126, (see Fig. 9,) which contacts with a lip 127 on a bell-crank lever 128 of the form shown in Fig. 8 with every revolution of said drum 120 and causes the upper toothed end of said bell-crank lever 128 to move the pinion-wheel

129 and the drum 121, connected therewith, a distance equal to one tooth of said pinion-wheel 129, and thus with every revolution of the cylinder or drum 120 the carrying to the cylinder or drum 121 is accomplished. The cylinders or drums 120 and 121 are totalizing cylinders or drums and correspond in their construction substantially with the cylinders or drums 52. The bell-crank levers 123 and 128 are returned to their normal position after every revolution of the arms 124 and 126 by means of the springs 130, flexed against them. The arms 124 and 126 move the upper ends of the bell-crank levers 123 and 128 forward to perform the carrying, and thereafter all of the cylinders or drums on the shaft 53 elevate, and upon this elevation of the cylinders or drums with the shaft 53 the springs 130 are left free to restore the bell-crank levers 123 and 128 to their normal position. (Shown by full lines in Fig. 8.) The springs 130 are only permitted to restore the bell-crank levers 123 and 128 to their normal position when the cylinders or drums on the shaft 53 elevate to their normal position and at such time leave the said levers 123 and 128. The pinion-wheel 122 is prevented from turning in the reverse direction during the return to its normal position of the lever 123 by means of the retaining-spring pawl 82, (shown in Fig. 8,) which engages said pinion-wheel. The lower arms of the bell-crank levers 123 and 128 are bifurcated and straddle the shaft 107, which operates as a stop to limit both the forward and backward movements of said levers 123 and 128.

The registering cylinders or drums 52 and the totalizing cylinders or drums 120 and 121 may be inspected at any time desired by the person holding the key to the lock 43, which secures the door 42 in its closed position. Upon the opening of the door 42, said door swinging inward upon its hinges or shaft 131, the cylinder or drums 52, 120, and 121 may be inspected through the opening 40. After the inspection by the owner of the register has been made and a memorandum made of the showing produced by the cylinders or drums 52, 120, and 121 it will be desirable to turn all of the cylinders 52, 120, and 121 back to their zero position, and this is accomplished by means of the series of pinion-wheels 98 on the shaft 99, which may be operated from the outside of the register-casing by means of the knob or handle 100. The pinion-wheels 98, as above described, engage the teeth or notches 97 on the cylinders or drums 52, 120, and 121, and by turning the shaft 99 and pinion-wheels 98 all of said cylinders or drums may be conveniently restored to their zero position. It has been described above that each of the cylinders or drums is lacking in one or more of the teeth 97, and this is a feature of importance, since thereby after one cylinder or drum 52 has reached its zero position and the blank in its teeth 79 has reached its pinion-wheel 98 the shaft 99 may be continued in its

turning until all of the other cylinders or drums have reached their zero position without disturbing the cylinder or drum or cylinders or drums first attaining its or their zero position. The blank in the teeth 97 of the cylinders or drums 52, 120, and 121 is arranged with respect to the zero position of said cylinders or drums, and hence when all of the cylinders or drums have reached their zero position the then continued turning of the shaft 99 and pinion-wheels 98 would have no effect whatever upon the said cylinders or drums. It is to be noted that the restoration of the cylinders or drums 52, 120, and 121 is performed by the owner of the register after the door 42 has been opened and while the same is in its open position. The closing of the door 42 by the owner of the register causes the arm 132 to swing frontward over the arm 133, which engages one of the pinion-wheels 98 and locks said pinion-wheel and through it all of the other pinion-wheels 98 and shaft 99 against revolution. Consequently in order to reset the registering cylinders or drums the door 42 must first be opened in order that the arm 132 (clearly shown in Fig. 2) will be moved rearward from over the stop-arm 133, engaging the said pinion-wheel 98. The pinion-wheels 98 are on the shaft 99, which is stationary so far as vertical movement is concerned, and the cylinders or drums 52, 120, and 121 are on the shaft 53, which is carried by the bell-crank levers 55, and hence when the said cylinders or drums are in the operation of registering they are in their lower position free from the pinion-wheels 98, and when they are in their upper position, in which they may be restored to their zero position, they are away from the registering mechanism and in engagement only with the said pinion-wheels 98, by which they may be restored to their zero position when desired.

Upon the shaft 68, carrying the bell-crank levers 55, are the arms, such as illustrated in Fig. 8 at 134, which carry the springs 82, hereinbefore described as being in engagement with the series of pinion-wheels 54. These springs 82 prevent the pinion-wheels 54 and the registering cylinders or drums from turning backward and from having any undue movement.

The operation of the cash-register made the subject of this application will probably be so fully comprehended from the description hereinbefore given that but slight further explanation in this respect will be required.

The actuating or setting levers 33 are moved up their slots 36 and arrested at the proper numerals in the column of numerals 35 to indicate the amount of the purchase, and this upward movement of the setting or actuating levers 33 results in two functions being performed, and one is this, that the slackening up of the tapes 86 permits the springs 90 of the indicating-drums 83 to revolve said drums toward the openings 41 in the front of the register-casing a proper distance to indicate

the same numerals at which the levers 33 were arrested during their movement along the slots 36. The other function performed by the upward movement of the levers 33 is that while they recede from the segments 48 the latter, through the weights 50, are permitted to follow up said levers 33, and thereby said segments are given a proper position, governed by the position of the levers 33 to affect the registration on the registering cylinders or drums 52 of the amounts indicated by the position of the levers 33 and the cylinders or drums 83. Thus the movement of the levers 33 sets the indicating cylinders or drums 83 and also the segments 48 preparatory to the final operation of the machine by which said segments 48 are caused to affect the registration. If during the movement of the levers 33 the shutter 44 shall have been in its elevated position, supported by the central arm 92 of the plate 74, the movement of said drums, due to the slackening of the tapes 86 and the action of the springs 90, will, by means of their fingers 94, contacting with the fingers 95 on said plate 74, tilt the said central arm 92 rearward free of the connecting-rod 93 of said shutter 44 and permit the latter to descend to its closed position (shown in Fig. 2) prior to the complete indication upon the drums or cylinders 83. After the levers 33 have thus been moved to set the segments 48 and indicating cylinders or drums 83 one of said levers 33 is pressed directly inward in order that its inner end 56 may drive outward the lower arm of the bell-crank lever 55 directly in line with it. This outward movement of the lower arm of the bell-crank lever 55 causes the shaft 68, upon which all of the bell-crank levers 55 are mounted, to have a limited axial motion, whereby the shaft 53, carrying the series of pinions 54 and drums 52, 120, and 121, is drawn downward to the position shown in Fig. 12 from that illustrated in Fig. 13 a sufficient distance for said pinions 54 to come into operative relation with the segments 48 then in their upper or set position. The downward movement of the shaft 53, carrying the registering and totalizing cylinders or drums, also throws the pinions 122 and 129 into operative relation to the toothed upper ends of the levers 123 and 128 for the totalizing cylinders or drums, as more clearly illustrated in Figs. 8 and 9. The inward thrust of the actuating-lever 33 by driving the lower arm of the bell-crank levers 55 rearward not only causes the pinions 54, 122, and 127 to pass downward into operative relation with the segments 48 and levers 123 and 128, but, as above indicated, affects an axial motion in the shaft 68, and this, as indicated in Figs. 4 and 7, turns the arm 71 on said shaft 68 rearward and through the hook-shaped plate 69 pulls the arm 67 from over the stop-pin 66 and pulls the hooked plate 76 from the notch 75 in the disk-plate 65, and thereby permits the spring 32 in rear of the

cash-drawer to drive the rack 58 against the pinion-wheel 60 and through the pinion-wheel 59 rotate the shaft 46, causing the latter to have a complete revolution. The revolving motion of the shaft 46 causes the cam-plate 64 and disk-plate 65, Figs. 4, 5, and 7, to have a like revolution, whereby the pin 66, carried by the plate 64, strikes the rear end of the shank of the bell-hammer 70 and sounds the gong, and the periphery of the disk-plate 65, through a complete revolution of the shaft 46, acting against the lower end of the hooked plate 76, holds said plate 76 in its rear position, and thus prevents any axial motion in the shaft 68 during the revolution of the shaft 46, and this operation is important in that the plate 65 by thus preventing the shaft 68 from rotating during the revolution of the shaft 46 retains the bell-crank levers 55 in the position in which they are shown in Fig. 12 and preserves the series of pinion-wheels 54, 122, and 127 in their lower position in operative relation with the segments 48 and levers 123 and 128. In the absence of some means of holding the shaft 68 against revolution during the revolving motion of the shaft 46 the spring 57 would tend to elevate the shaft 53 and move the bell-crank levers 55 and shaft 68 into their normal position. (Shown in Fig. 13.) The revolving motion of the shaft 46, due to the spring 32, results in the plates 77 performing a complete revolution, said plates being rigid upon said shaft 46. The shaft 46 with each motion imparted to it performs a complete revolution, and hence the plates 77 will always perform a complete revolution. The revolving motion of the plates 77 causes the projections or fingers 78 on said plates to contact with the hooks 79 of the loosely-pivoted plates 80, carried by the segments 48, and in said segments being turned frontward and downward by said plates 77 until the outer heavy ends of said plates 80 contact with the stops on the shaft 107, and thereby turn the hooks 79 in a direction from the fingers or projections 78 on said plates 77, thus releasing said fingers or projections 78 from said hooks 79 and permitting the segments 48 and plates 80 to remain at rest while the shaft 46 and plates 77 continue their revolution. The fingers or projections 78 on the plates 77 will engage all of the hooks 79 of the plate 80 that may be in their path. As illustrated in Figs. 12 and 13, the plates 77 are so set upon the shaft 46 that the projections or fingers on said plates 77 are at right angles to one another in series around the shaft 46, and thus the said projections or fingers 78 do not all simultaneously seize the hooks 79 of the plates 80, carried by the segments 48, but during the revolution of the shaft 46 one after another comes into operative relation with the plate 80 of its segment 48, and thus the segments 48 are not all moved simultaneously during the revolution of the shaft 46, but are in succession moved one after another, whereby at no time are all of the segments 48 and all of the registering

cylinders or drums 52 operated simultaneously, although all of said elements may be operated without loss of time during each complete revolution of the shaft 46. The movement of the segments 48 against the pinions 54 turns the registering cylinders or drums 52 a proper distance to register the amount indicated on the cylinders or drums 83 and also indicated upon the front plate 34 of the register by the position at which the levers 33 were arrested in their slots 36. The inward thrust of the lever 33 to release the spring 32, so that said spring might operate to revolve the shaft 46, also results in the stop-pin 66 on the plate 64, carried by said shaft 46, coming into contact with the rear end of the hooked plate 69 and elevating the rod 73, and through said rod and the connecting-rod 93 elevating the shutter 44 from the openings 41 in front of the indicating cylinders or drums 83. Since the levers 33 are moved to indicate the amount of a purchase, the shutter 44 will remain in its upward position after having once been elevated until the levers 33 are again moved to indicate a further purchase, and the said shutter 44 is thus held in its upward position after having been raised by the arm 73 by means of the central arm 92 on the plate 74 tilting frontward below the connecting-rod 93 and forming a prop to hold the same in its elevated position. The revolving motion of the pinions 54 and drums 52 is utilized to effect the carrying from one of the said drums to the other thereof, and thus each of said drums 52 is integral with each of its pinion-wheels 54 and also rigid with an arm 101 of the character illustrated in Figs. 11, 12, and 13. With each revolution of a drum 52 the arm 101 makes a complete revolution and moves a three-armed lever 102 (shown in Fig. 11) a short distance, and thereby turns the flattened side 110 of the stop for the adjacent plate 80, in order that during the revolution of the shaft 46 the said stop, by reason of having its flattened portion 110 turned upward, will allow the engagement of the said plate 80 with its plate 77 on said shaft 46 for a period slightly greater than it would have permitted such engagement were said flattened portion 110 of said stop not turned upward, and thus the said plate 77 is permitted to draw the said plate 80 and the segments 48, connected therewith, a slightly-greater distance than would otherwise have been permitted, this greater movement representing one notch or space on the cylinder or drum 52 to be carried thereunto. After the arm 101, connected with the cylinders or drums 52, has moved and passed beyond the three-armed lever 102 and the operation of registering has been performed by the completion of the motion of the shaft 46 the parts will come to a rest, and the stop-pin 66 on the plate 64 will pass directly below the stop-plate 67 on the shaft 68, and the hooked end of the plate 76 will enter the notch 75 in the periphery of the disk 65, and the shaft 68 thus having been

permitted, under the action of the spring 57, to return to its normal position the bell-crank levers 55 will return to the position in which they are shown in Fig. 13, elevating the shaft 53 and all of the parts thereon, while the lower arms of said bell-crank levers 55 press outward the lever or levers 33, previously driven inward, and contact with the lower arm or arms of the three-armed lever or levers 102, restoring said levers and the stops affected by their segmental arm 104 to their normal position. The parts having been restored to their normal position, the cash-drawer 31 may be again pressed inward to its closed position against the spring 32 without disturbing any of the operative parts of the machine, since during the inward motion of said cash-drawer the tramway 62 at one edge of its rack 58 will engage one of the wider teeth 63 of the pinion 60 and elevate the same to the position in which said wheel is illustrated by dotted lines in Fig. 4, said wider tooth 63 simply riding on said tramway 62 until said rack 58 has reached its extreme inward movement, whereupon said wider tooth 63 will fall into position in front of said rack 58 and permit the teeth of the pinion-wheel 60 to engage the teeth of the rack 58. In the present instance the pinion-wheel 60 is larger than the pinion-wheel 59 and will make one-half of a revolution each time the drawer 31 is opened, and with each half-revolution of the pinion-wheel 60 the pinion-wheel 59 makes a complete revolution.

The method of carrying from one of the registering cylinders or drums 52 to the next adjoining cylinder or drum 52 in series and the method of carrying from one of the totalizing cylinders or drums to the other totalizing cylinder or drum have been sufficiently described hereinbefore.

In the accompanying drawings I have shown the spring 32 as pressing against a cash-drawer 31 and the rack 58 as carried by said cash-drawer; but the invention is not limited to the use of the cash-drawer, since in so far as the spring 32 is concerned the cash-drawer represents simply a convenient slide for carrying the rack 58, and whether said rack 58 is arranged upon what is technically termed a "cash-drawer" or upon a slide which would not form a receptacle for cash is immaterial. The rack 58, in connection with the gear-wheel 60, enables the spring 32 to rotate the gear-wheel 59 and shaft 46 and through said shaft to disclose the proper indication on the cylinders or drums 83 and operate the registering cylinders or drums 52, and I regard it as immaterial whether said rack 58 is arranged upon the cash-drawer or upon some other form of convenient slide arranged to be acted upon by the spring 32.

It is not intended to limit this application to the details of construction further than said details may be specifically pointed out in the claims, and these details in their form and arrangement in the broader scope of this

invention will be varied at will, in accordance with the size of the register to be produced and the will of the manufacturer. The cash-register shown in the drawings is provided with four of the actuating or setting levers 33; but these in number will vary as occasion may require. When a less number than four of the levers 33 is used, the number of indicating cylinders or drums 83 and registering cylinders or drums 52 will be reduced accordingly.

The plates 77 constitute lever-arms which have a revoluble motion with the driving-shaft 46 for the purpose of moving the segments 48, and said plates or revoluble lever-arms will be of any suitable form. The disks or drums 52 and the disks or drums 83 will also vary in form, as desired, and I claim the right to give these parts any form which will not preclude their revolving and displaying the numerals.

Without, therefore, limiting myself to details of construction or forms of parts, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the movable segment substantially independent of but adapted to automatically follow said lever and to have its position controlled by said lever, the registering drum or disk, and the gear connected therewith, combined with means for bringing said gear into engagement with said segment after the latter has reached its predetermined operative position, spring-actuated mechanism for thereafter moving said segment against said gear for rotating said drum or disk, and means for releasing said spring-actuated mechanism to act by means of said lever, whereby after said lever, segment and gear have reached their position said spring-actuated mechanism may by means of said lever be caused to act and operate said segment and gear, said segment being during such operation returned to its initial position; substantially as set forth.

2. In a cash-register, the series of hand-levers, the plate having the series of numerals along which said levers may be moved in accordance with the values to be indicated, the series of movable segments substantially independent of but adapted to automatically follow said levers and to have their position controlled by said levers, the series of registering cylinders or drums, and the gear connected therewith, combined with means for bringing said gearing into engagement with said segments after the latter have reached their predetermined operative position, spring-actuated mechanism for thereafter moving said segments against said gearing for rotating said cylinders or drums, and means for releasing said spring-actuated mechanism to act by means of any of said levers, whereby after said levers, segments and gearing have

reached their operative position said spring-actuated mechanism may, by means of any of said levers, be caused to act and operate said segments and gear, said segments being during such operation returned to their initial position; substantially as set forth.

3. In a cash-register, the series of setting or operating levers, the plate having the series of numerals along which said levers may be moved in accordance with the values to be indicated, the series of rocking segments substantially independent of but adapted to automatically follow said levers and to have their positions thereby controlled by said levers, the registering cylinders or drums, and the gearing connected therewith, combined with means for bringing said gearing into engagement with said segments after the latter have completed their movement in one direction and reached their predetermined operative positions, the spring for indirectly moving said segments against said gearing for the purpose of rotating said cylinders or drums, means intermediate said levers and said spring, whereby from any one of said levers said spring may be released to actuate said segments and return said segments back to their normal position; substantially as set forth.

4. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segment substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, the registering cylinder or drum, and the gearing connected therewith, combined with means normally supporting said cylinder or drum and said gearing free of said segment, means intermediate said gearing and the said hand-lever and operable from said hand-lever, at any point along said series of numerals, to bring said gear into engagement with said segment then in its predetermined operative position, and the spring for indirectly moving said segment against said gear for the purpose of rotating said cylinder or drum and returning said segment to its normal position; substantially as set forth.

5. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segments substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, the registering cylinder or drum, and the gear connected therewith, combined with means normally supporting said gear away from said segment, means operable from said hand-lever, while the latter is at any point along said series of numerals, for moving said gear into engagement with said segment, and means intermediate the cash-drawer and said segment for moving the latter against said gear during the opening of said cash-drawer,

and thereby during the opening of said cash-drawer causing said segment to return to its normal position and in doing so rotate said cylinder or drum; substantially as set forth.

6. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segment substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, the registering cylinder or drum, and the gear connected therewith, combined with means normally supporting said gear away from said segment, means directly operable from said hand-lever, at any point of the latter along said series of numerals, for bringing said gear into engagement with said segment then in its predetermined operative position, means for moving said segment against said gear to rotate said drum on the return of said segment to its normal position, and means independent of said hand-lever for maintaining the relationship of said gear with said segment during the movement of the latter to its normal position and then permitting said gear to assume its normal position; substantially as set forth.

7. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segment substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, the registering cylinder or drum, and the gear connected therewith, combined with means normally holding said gear free from said segment, means directly operable from said hand-lever, at any point along said series of numerals, for bringing said gear into engagement with said segment, means also operable from said hand-lever for indicating to the purchaser the amount to be registered, the spring for indirectly moving said segment against said gear for the purpose of rotating said cylinder or drum during the return of said segment to its normal position, and means intermediate said hand-lever and said spring for releasing the latter from the former to actuate said segment; substantially as set forth.

8. In a cash-register, the series of hand-levers, the plate having the series of numerals along which said levers may be moved in accordance with the value to be indicated, the series of rocking segments substantially independent of but adapted to automatically follow said levers and to have their position thereby controlled by said levers, the shaft above said segments and the series of independent gears and registering cylinders or drums on said shaft, combined with the levers supporting said shaft, means intermediate said hand-levers and said shaft for moving the latter toward said segments and causing the said gears to engage the then elevated segments, the spring for driving said seg-

ments against said gears and back to their normal position whereby said segments are caused to rotate said cylinders or drums, and means intermediate said hand-levers and said spring whereby any one of said levers, at any point along the said series of numerals, may be used to release said spring substantially simultaneously with the lowering of said gears into engagement with said segments; substantially as set forth.

9. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segments substantially independent of but having a weighted lower end to cause it to automatically follow said lever on the upward movement of the latter, the registering cylinder or drum, and the gear connected therewith, combined with means for moving said segment against said gear during the returning movement of said segment to its normal position without affecting the said hand-lever, whereby said segment is given its predetermined operative position by the upward movement of said hand-lever and is then returned to its normal position independently of said hand-lever and is at such time caused to operate said cylinder or drum; substantially as set forth.

10. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segment substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, means connected with said segment to cause it to automatically follow the said lever during the upward movement of the latter, the registering cylinder or drum, and the gear connected therewith, combined with means operable from said hand-lever, at any point along said series of numerals, for bringing said gear into engagement with said segment, and means intermediate the cash-drawer and said segment for causing the latter upon the opening of said drawer to return to its normal position independently of said lever, and while doing so move against said gear and rotate said cylinder or drum; substantially as set forth.

11. In a cash-register, the hand-lever, the plate having the series of numerals along which said lever may be moved in accordance with the value to be indicated, the rocking segment substantially independent of but adapted to automatically follow said lever and to have its position thereby controlled by said lever, means connected with said segment for causing it to automatically follow said lever during the upward movement of the latter, the registering cylinder or drum, and the gear connected therewith, combined with means normally supporting said gear free from said segment, means intermediate said hand-lever and said gear for causing the latter to move into engagement with said segment after the

latter has reached its predetermined operative position and said lever has reached its position along said series of numerals, spring-actuated mechanism for returning said segment to its normal position and causing it, during said movement, to rotate said gear and said cylinder or drum, and means intermediate said hand-lever and said spring-actuated mechanism for releasing the latter to operate said segment while said hand-lever is at any point along said series of numerals; substantially as set forth.

12. In a cash-register, the series of hand-levers, the plate having the series of numerals along which said levers may be moved in accordance with the values to be indicated, the series of independent rocking segments substantially independent of but adapted to automatically follow said levers and to have their varied positions thereby controlled by said levers, the series of registering cylinders or drums, and the gear connected therewith, combined with means normally holding said gears free from said segments, means for bringing said gears into engagement with said segments after the latter have completed their movement in one direction from their normal position to their predetermined operative positions, means for moving said segments against said gears and back to their normal position for the purpose of rotating said cylinders or drums, the stops to limit the throw of said segments, and means intermediate said registering cylinders or drums and said stops for varying the relation of the latter with said segments in order that upon a complete revolution of the said drums the said stops will permit a more extended movement of said segments in order to carry from one registering cylinder or drum to another in series; substantially as set forth.

13. In a cash-register, the series of hand-levers, the series of segments, whose position is independently controlled by the position of said levers, means for causing said segments to follow said levers and thereby become set into their proper positions, the series of independent registering cylinders or drums, and the gearing connected therewith and adapted for independent engagement with said segments, combined with means supporting said cylinders or drums normally away from said segments, means intermediate the said cylinders or drums and said hand-levers and operable from the latter for simultaneously engaging all of said segments then elevated with said gearing, the spring for moving said segments against said gearing to rotate said cylinders or drums, means intermediate said hand-levers and said spring for releasing the latter to actuate said segments, and means directing the force of said spring against said segments, one after another in series; substantially as set forth.

14. In a cash-register, the hand-lever, the movable segment whose position is controlled by the position of said lever, the registering

cylinder or drum and the gear connected therewith, combined with means operable from said hand-lever for bringing said gear into engagement with said segment, the
 5 hooked plate on said segment, the revoluble arm adapted to engage said hooked plate, the spring for actuating the said revoluble arm to engage said hooked plate and move said segment against said gear and means inter-
 10 mediate said hand-lever and said spring for releasing the latter from the former to effect the movement of said revoluble arm against said hooked plate; substantially as set forth.

15 15. In a cash-register, the hand-lever, the movable segment whose position is controlled by the position of said lever, the registering cylinder or drum and the gear connected therewith and adapted for engagement with said segment, combined with the hooked plate
 20 pivoted to said segment, the revoluble arm adapted to engage said hooked plate and thereby actuate said segment, means for releasing said hooked plate from said arm after the latter has performed a part of a revolu-
 25 tion only, means operable from said hand-lever for bringing said gear into engagement with said segment and means for actuating said revoluble arm to move said segment against said gear; substantially as set forth.

30 16. In a cash-register, the series of hand-levers, the series of segments which are independent of one another and whose position is controlled by the position of said hand-
 35 levers, the registering cylinders or drums and the gears connected therewith and adapted for engagement with said segments, combined with means operable from said hand-levers for moving said gears into engagement with
 40 said segments after the latter have been put into their predetermined position, the pivotal hooked plates applied to said segments, the revoluble shaft having the series of arms adapted for independent engagement with
 45 said hooked plates, means for imparting to said shaft a complete revolution, and means for releasing said revoluble arms from said hooked plates after said arms and said shaft have made a part of a revolution and moved
 50 said segments against said gears; substantially as set forth.

17. In a cash-register, the series of hand-levers, the series of independently-movable segments whose position is controlled by the position of said levers, the registering cylin-
 55 ders or drums and the gears connected therewith, combined with means operable from said hand-levers for moving said gears into engagement with said segments, the hooked plates pivotally secured to said segments, the revoluble shaft carrying the revoluble
 60 arms for engagement with said hooked plates, the spring for imparting to said shaft and the arms carried thereby a complete revolution, and means for releasing said arms from
 65 said hooked plates after said parts have been engaged during only a portion of the revolution of said shaft, the said arms on said rev-

oluble shaft being arranged at angles to one another in series around the shaft in order that they may engage said hooked plates one
 70 after another for the purpose of moving said segments one after another instead of simultaneously; substantially as set forth.

18. In a cash-register, the series of hand-
 75 levers, the plate having the series of numerals along which said levers may be moved in accordance with the values to be indicated, the series of independent rocking segments substantially independent of but adapted to
 80 automatically follow said levers and to have their varied positions thereby controlled by said levers, the registering cylinders or drums, and the gears connected therewith, combined with means normally holding said gears from
 85 engagement with said segments, means actuated by any of said hand-levers while the latter are at any point along said series of numerals for bringing said gears into engage-
 90 ment with said segments, means under the control of all and each of said hand-levers for driving said segments back to their normal position away from said hand-levers for the purpose of causing said segments, during such
 95 movement, to rotate said cylinders or drums, and means for carrying from one cylinder or drum to another in series; substantially as set forth.

19. In a cash-register, the hand-levers, the independent movable segments whose posi-
 100 tion is controlled by the position of said levers, the registering cylinders or drums and the gears connected therewith, combined with means normally holding said gears from said segments, means for moving said gears into en-
 105 gagement with said segments, means for moving said segments against said gears for the purpose of rotating said cylinders or drums, the variable stops to limit the throw of said segments against said gears, the lever-arms
 110 connected with said cylinders or drums, the levers adapted to be moved by said lever-arms with every revolution of said cylinders or drums, the segments forming a part of said levers actuated by said lever-arms, the pinions
 115 in engagement with the last-mentioned segments and the stops having the flattened side connected with said last-mentioned pinions, whereby, upon each revolution of the said cy-
 120 linders or drums said lever-arms actuate said levers to operate through their segments and actuating-pinions to turn the flattened side of said stops upward; substantially as set forth.

20. In a cash-register, the hand-levers, the independent movable segments whose posi-
 125 tion is controlled by the position of said levers, the registering cylinders or drums and the gears connected therewith, combined with means normally holding said gears from en-
 130 gagement with said segments, means for bringing said gears into engagement with said segments, the driving-shaft, the arms carried thereby and revolving therewith, means for imparting to said shaft a complete revolution, the hooked plates pivotally secured to said

segments, the stops in the path of said hooked plates, said stops being variable in their relation to said hooked plates, and means intermediate said registering cylinders or drums 5 and said stops for varying the position of the latter in order to regulate the throw of said segments and permit the carrying from one registering cylinder or drum to another; substantially as set forth.

10 21. In a cash-register, the hand-levers, the movable segments whose position is controlled by the position of said levers, the registering cylinders or drums and the gears connected therewith, combined with means for moving 15 said gears into engagement with said segments after the latter have been given their predetermined position, the driving-shaft, the arms on and revoluble with said shaft, the hooked plates on said segments and adapted 20 to be caught by said arms during the revolving motion of said shaft, means for operating said shaft, the lever-arms on said cylinders or drums, the variable stops for said hooked plates and segments, the pinion-wheels con- 25 nected with said stops and the levers having the segments in mesh with said pinions and the upper arms in the path of said lever-arms whereby, upon each revolution of said cylinders or drums, said lever-arms may act upon 30 said stops to vary their relation to said hooked plates and segments; substantially as set forth.

22. In a cash-register, the hand-levers, the independent movable segments whose position is controlled by the position of said levers, the registering cylinders or drums, the gears connected therewith, the bell-crank levers in line with said hand-levers and supporting in their upper arms the shaft for said 40 cylinders or drums and gears, the shaft for said bell-crank levers, the spring for driving said segments against said gears when the latter are in engagement with said segments, and mechanism connected with the shaft of 45 said bell-crank levers for releasing the said spring to operate when said bell-crank levers are acted upon by said hand-levers to carry said gears into engagement with said segments; substantially as set forth.

50 23. In a cash-register, the hand-levers, the movable segments whose position is controlled by the position of said levers, the registering cylinders or drums, the gears connected therewith, the bell-crank levers carrying in their upper arms the shaft for said 55 cylinders or drums and said gears and the shaft supporting and movable with said bell-crank levers, combined with means for normally holding said gears free from said segments, means for moving said bell-crank levers to carry said gears into engagement with said segments, the hook 76 upon the shaft of said bell-crank levers, the driving-shaft from which said segments are operated against 60 said gears, the notched plate 65 upon said driving-shaft, the spring for imparting to

said driving-shaft a complete revolution, and thereby, through intermediate mechanism operating said segments, and means for releasing said spring after said hand-levers 70 have been moved to position, said hook 76 and said plate 65 being adapted to cooperate during the revolving motion of said driving-shaft to hold said gears into positive engagement with said segments; substantially as set 75 forth.

24. In a cash-register, the hand-levers, the movable segments whose position is controlled by the position of said levers, the registering cylinders or drums, the gears connected therewith, the bell-crank levers carrying in their 80 upper arms the shaft for said cylinders or drums and said gears, and means for normally holding said gears out of engagement with said segments, said hand-levers being adapted 85 to be pressed inward against the lower arms of said bell-crank levers for the purpose of turning them and their shaft and bringing the said gears into operative engagement with said segments, combined with the driving- 90 shaft, the spring for imparting to said shaft a complete revolution, means connected with said shaft for moving said segments against said gear-wheels to rotate said registering cylinders or drums, means connected with 95 the shaft of said bell-crank levers for maintaining said gears into engagement with said segments during the movement of the latter, the plate 64 on said driving-shaft and carrying a stop-pin, the lever-arm 91 upon the 100 shaft of said bell-crank levers, the stop-arm 67 adapted to cooperate with said stop-pin to stop the mechanism at each revolution of the said driving-shaft, the plate 69 carried by said arm 67 and engaged by said lever-arm 71 105 and the bell-hammer connected with said plate 69; substantially as set forth.

25. In a cash-register the hand-levers, the movable segments whose position is controlled by the position of said levers, the registering 110 cylinders or drums, the gears therefor, and the bell-crank levers carrying in their upper arms the shaft for said cylinders or drums and said gears, said hand-levers being adapted to be thrust inward against the lower arms of 115 said bell-crank levers for the purpose of rocking the shaft of said bell-crank levers and causing said gears to come into engagement with said segments, combined with the driving-shaft, means intermediate said shaft and 120 said segments for driving the latter against said gears, the spring for imparting to said shaft its revolving motion, means intermediate the shaft of said bell-crank levers and said spring for releasing the latter when said 125 bell-crank levers are moved by said hand-levers, and means intermediate the shaft of said bell-crank levers and the shutter for the indicating-drums for opening said shutter when said gears are moved into their engagement with said segments; substantially as set 130 forth.

26. In a cash-register, the hand-levers, the segments whose position is controlled by the position of said levers, the registering cylinders or drums, the gears therefor, the shaft upon which said cylinders or drums and gears are mounted, and the bell-crank levers carrying said shaft and being themselves rigid upon a shaft, combined with the driving-shaft, means intermediate said driving-shaft and said segments for operating the latter from the former, means for depressing said gears into engagement with said segments, the spring for actuating said segments, means connected with the shaft of said bell-crank levers for releasing said spring when said gears are brought into engagement with said segments, means intermediate the shaft of said bell-crank levers and the bell, for sounding the latter when said spring is released to operate, and means intermediate the shaft of said bell-crank levers and the shutter for opening the latter when said spring is released to operate; substantially as set forth.

27. In a cash-register, the hand-levers, the indicating cylinders or drums, the springs acting to turn said cylinders or drums in one direction, the tapes intermediate said cylinders or drums and said hand-levers, and the shutter for said indicating cylinders or drums, combined with the rod for opening said shutter at the time of registration, the plate for maintaining said shutter in its open position after said rod has elevated said shutter and returned to its lower position, and means intermediate said indicating cylinders or drums and said plate for removing the latter and permitting said shutter to descend as soon as any of said hand-levers are again actuated; substantially as set forth.

28. In a cash-register, the hand-levers, the indicating cylinders or drums, the tapes connecting said hand-levers with said cylinders or drums, and the springs adapted to drive said cylinders or drums in one direction upon the slackening of said tapes, combined with the shutter for said indicating cylinders or drums, the rod for elevating said shutter during registration, the plate for supporting said shutter in its elevated position when said rod returns to its lower position, the fingers upon said supporting-plate and the fingers upon the said cylinders or drums and adapted upon any further movement of said hand-levers to contact with the fingers upon said supporting-

plate and withdraw the support of the latter from said shutter; substantially as set forth.

29. In a cash-register, the oscillating hand-levers, the front plate having the slots through which the said levers are moved, and the teeth along said slots, combined with the wheels pivotally secured to said levers and engaging the teeth on said front plate and the springs flexed against said wheels and carried by said levers; substantially as set forth.

30. In a cash-register, the oscillating hand-levers, the wheels 38 carried by said levers, and the individual teeth 39, also carried by said levers, combined with the front plate having the slots 36 through which said levers are moved, and also having the teeth and notches, said front plate being intermediate said wheels 38 and said teeth 39, whereby, during the oscillating movement of said levers said wheels will engage said front plate and whereby, during the inward motion of said hand-levers when said wheels leave said front plate said individual teeth 39 will engage said front plate and hold said levers; substantially as set forth.

31. In a cash-register, the hand-levers, the registering cylinders or drums, and means set in motion by said hand-levers for revolving said cylinders or drums, combined with the totalizing cylinders or drums 120, 121, the arm 124 connected with the registering cylinder or drum adjacent to the totalizing cylinder or drum 120, the pinion 122 connected with the totalizing cylinder or drum 120, the lever 123 engaging said pinion-wheel and itself being in the path of said arm 124, the pinion-wheel 129 connected with said cylinder or drum 121, the arm 126 connected with the cylinder or drum 120, and the lever-arm 128 engaging said pinion 129 and being itself in the path of said arm 126, whereby the proper carrying from the registering cylinders or drums to the totalizing cylinders or drums and from one of the latter to the other in series is performed; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 18th day of November, A. D. 1897.

ELIJAH F. SPAULDING.

Witnesses:

CHAS. C. GILL,
E. JOS. BELKNAP.