

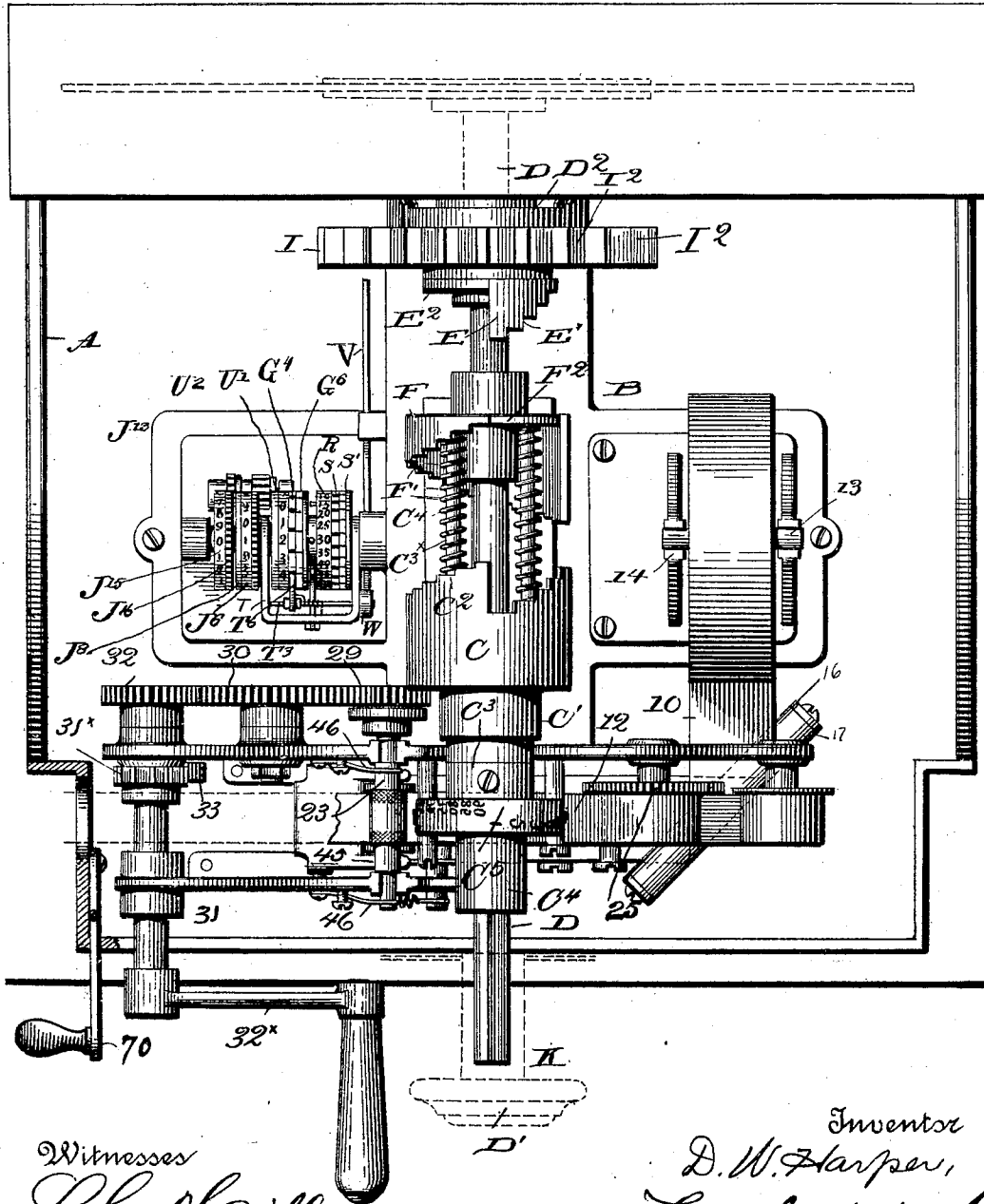
D. W. HARPER.  
CASH REGISTER.

(Application filed Feb. 25, 1899.)

(No Model.)

11 Sheets—Sheet 1.

~~Fig. 7.~~



Witnesses  
*L. C. Mills.*  
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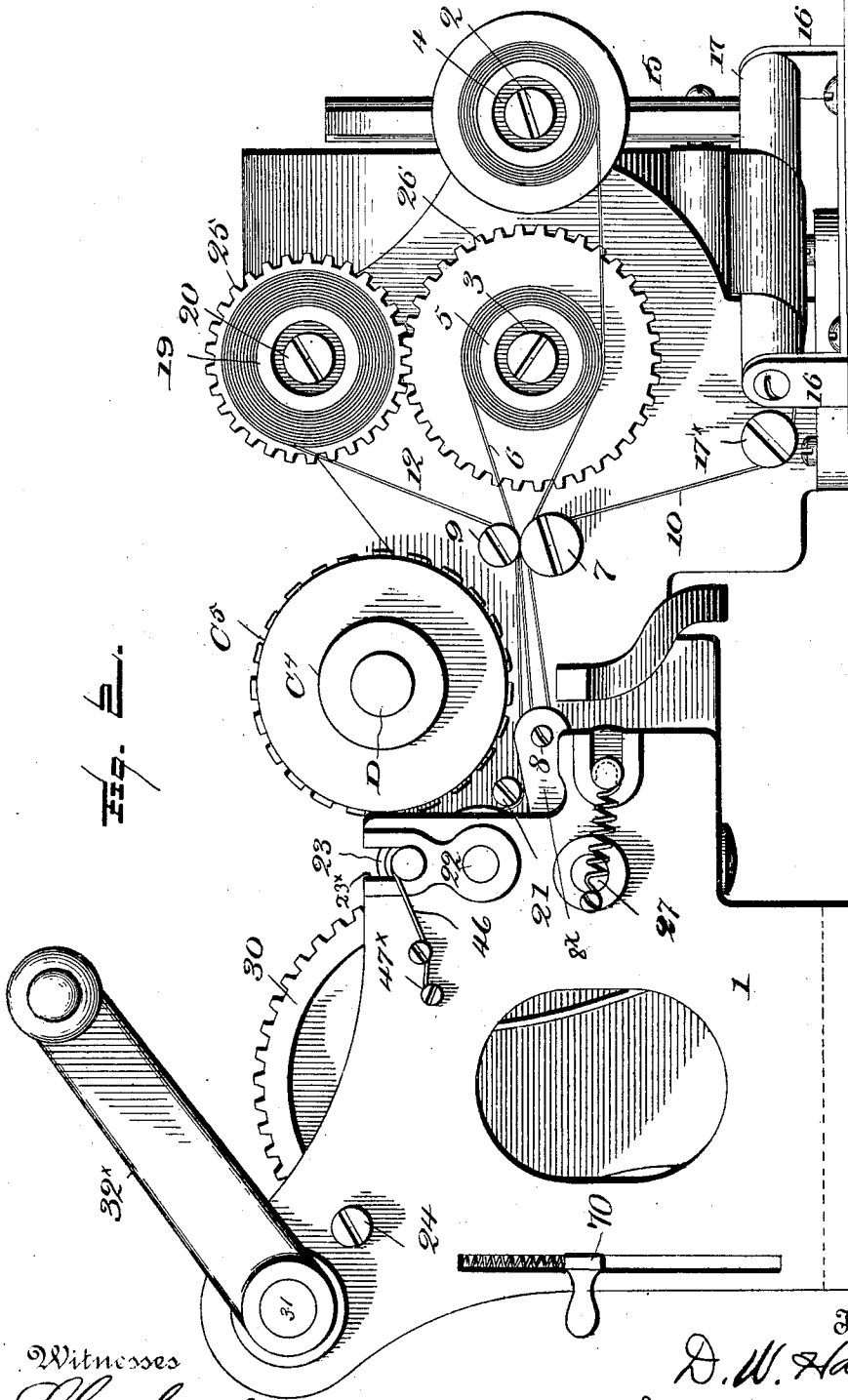
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D. W. HARPER.  
CASH REGISTER.

(Application filed Feb. 25, 1899.)

(No Model.)

11 Sheets—Sheet 2.



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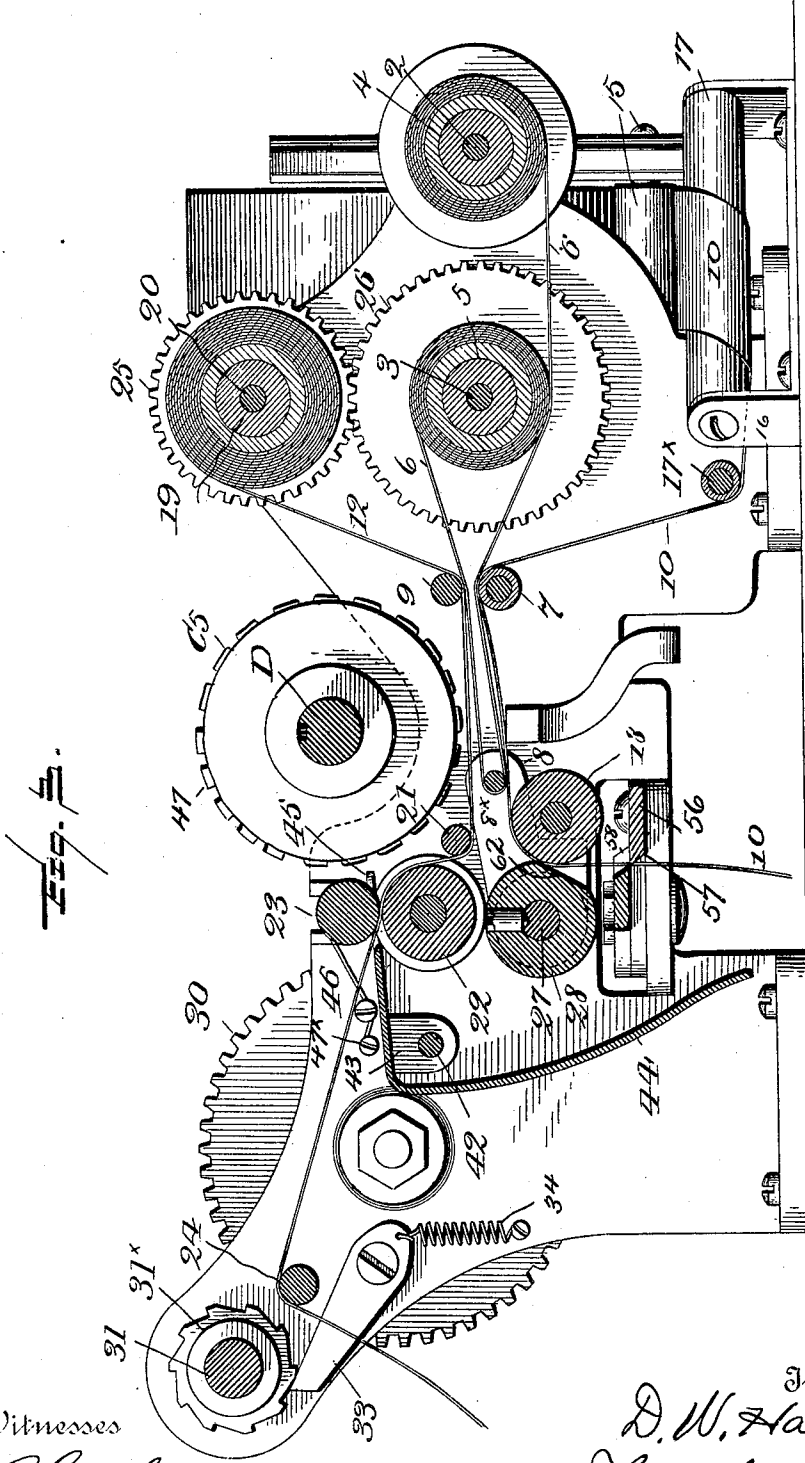
Patented July 23, 1901.

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11 Sheets—Sheet 3.



Witnesses  
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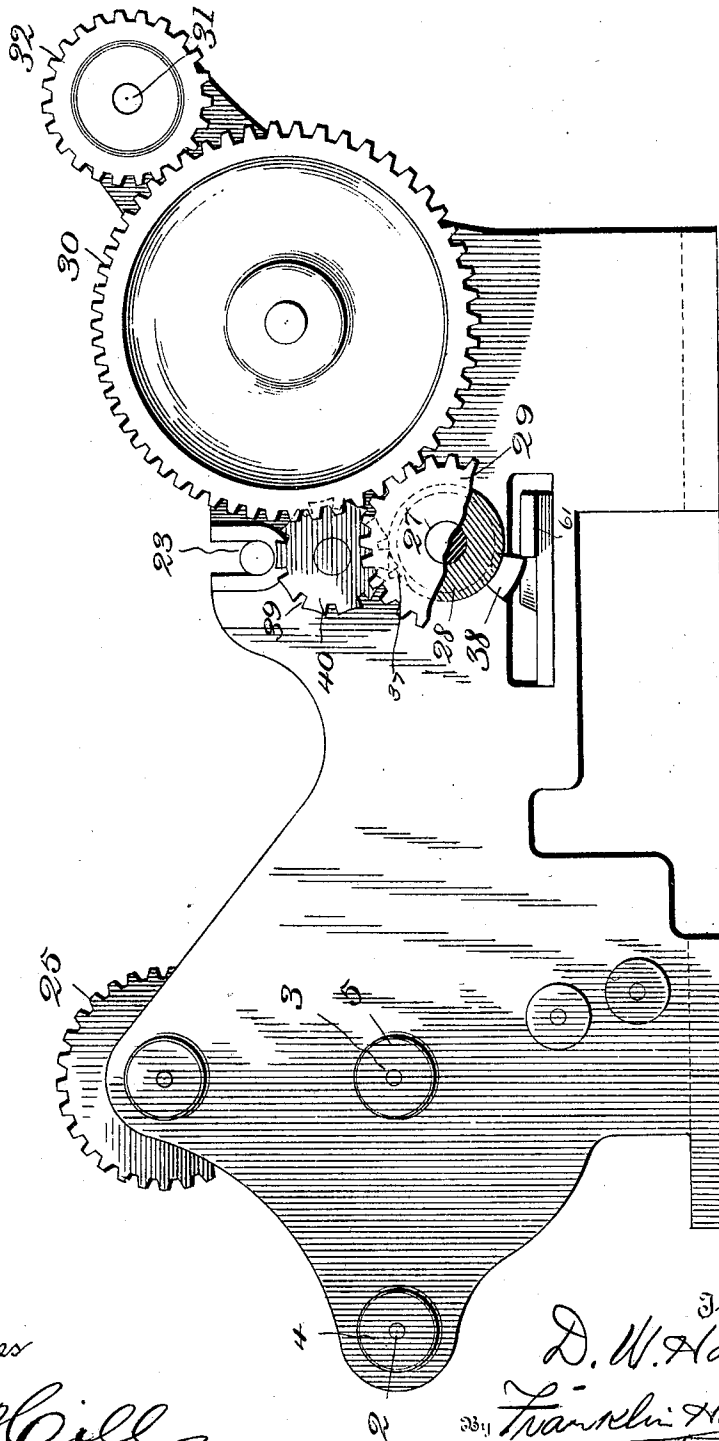
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11 Sheets—Sheet 4.

Fig. 4



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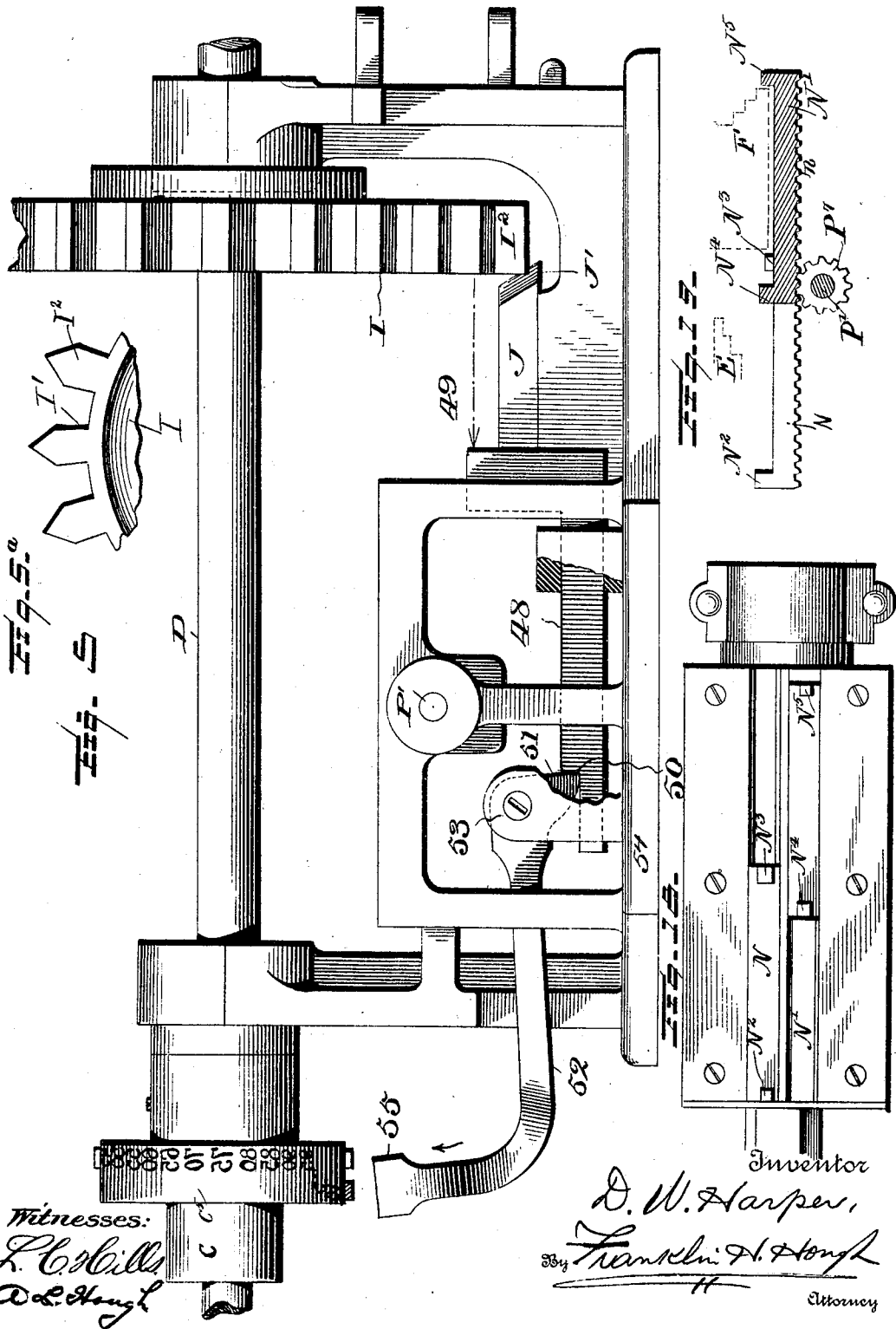
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11 Sheets—Sheet 5.



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11 Sheets—Sheet 6.

Fig. 6.

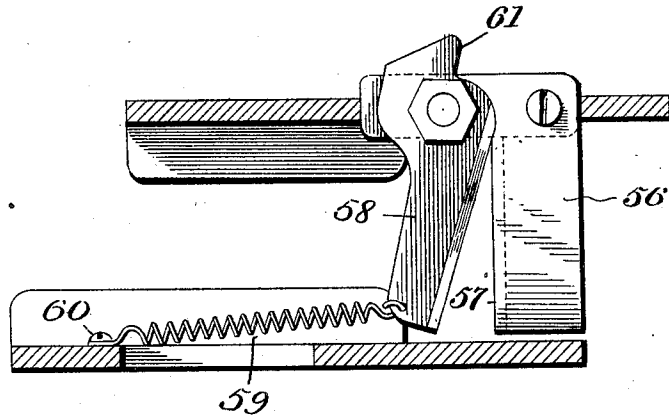


Fig. 7.

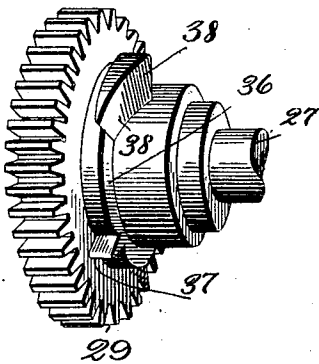


Fig. 8.

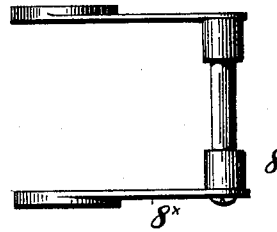
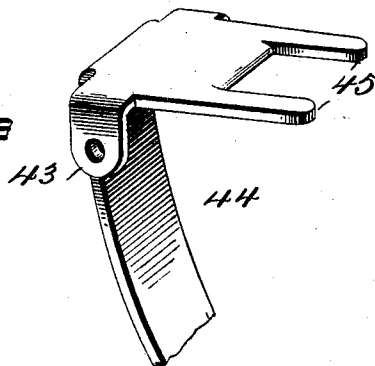


Fig. 9.



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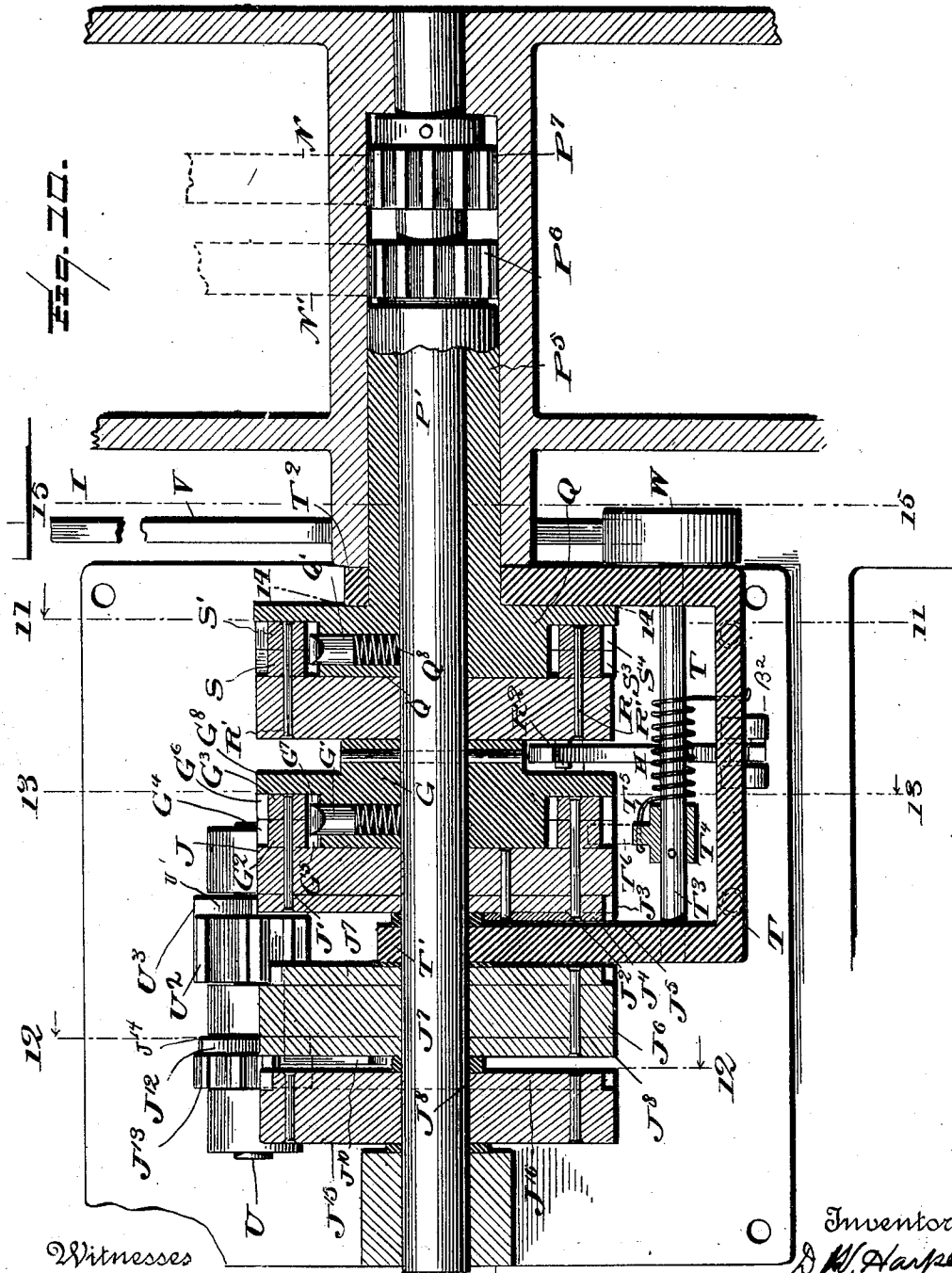
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(No Model.)

11 Sheets—Sheet 7.



Witnesses  
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(Application filed Feb. 25, 1899.)

(No Model.)

11 Sheets—Sheet 8.

Fig. 27.

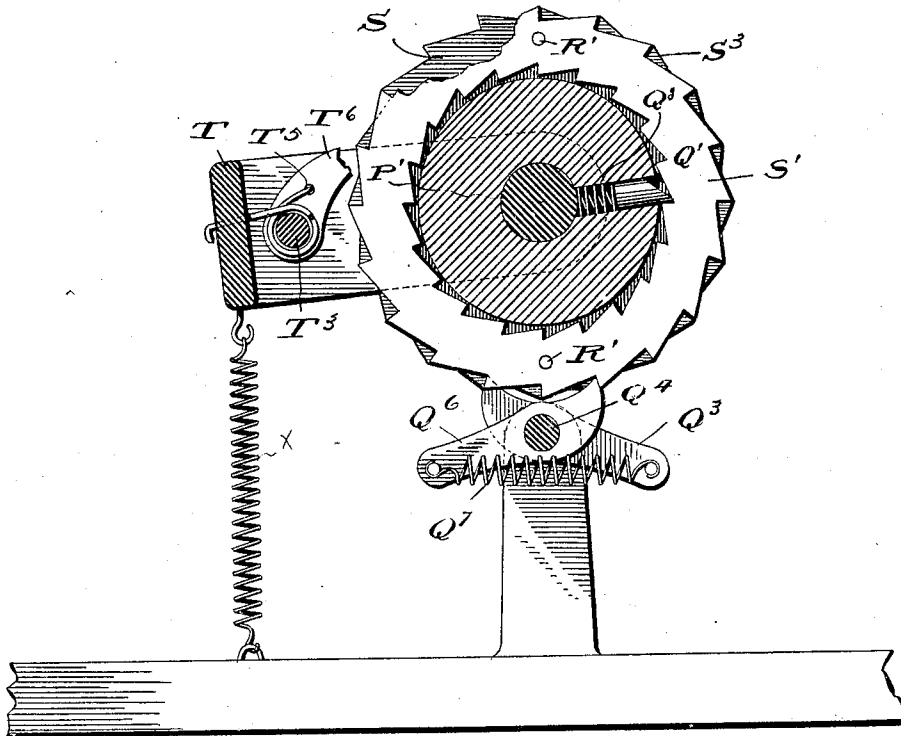
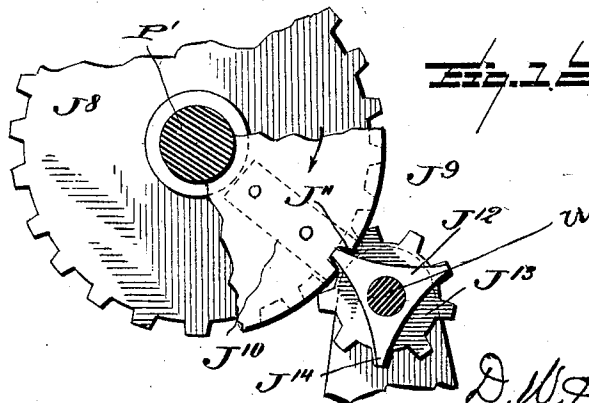


Fig. 28.



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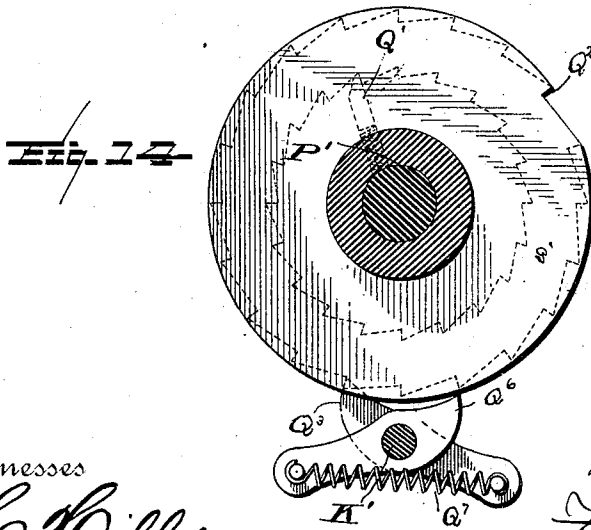
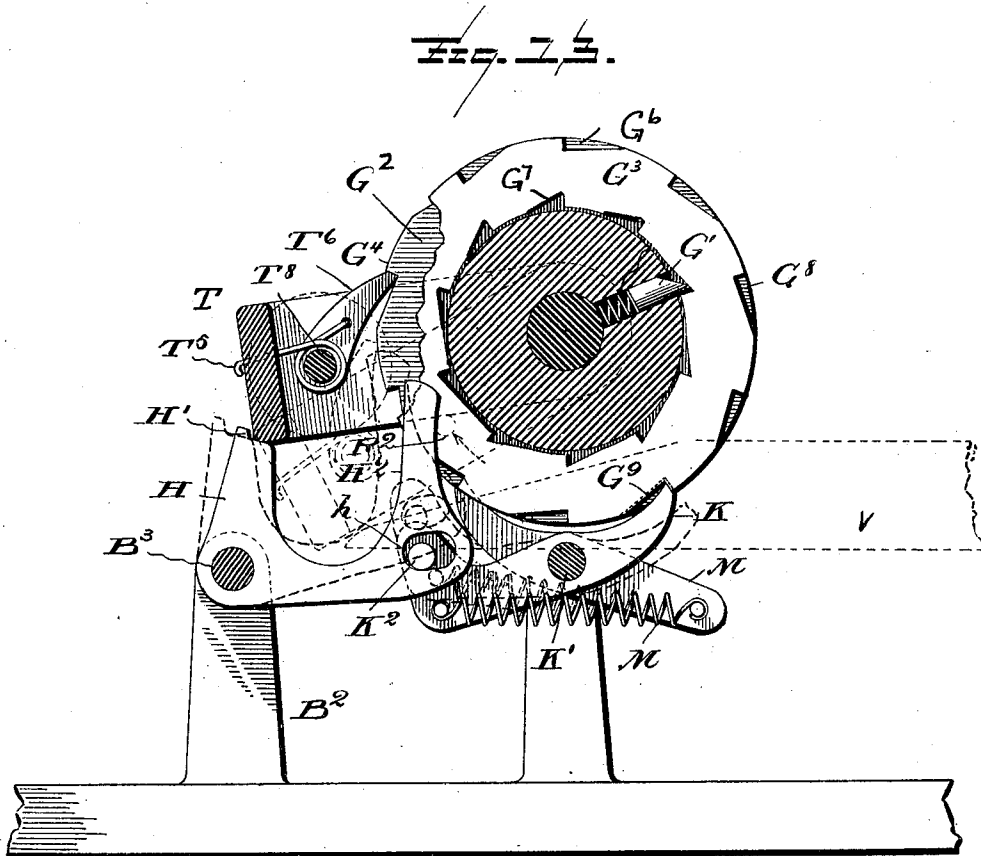


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(Application filed Feb. 25, 1899.)

(No Model.)

11 Sheets—Sheet 9.



Witnesses  
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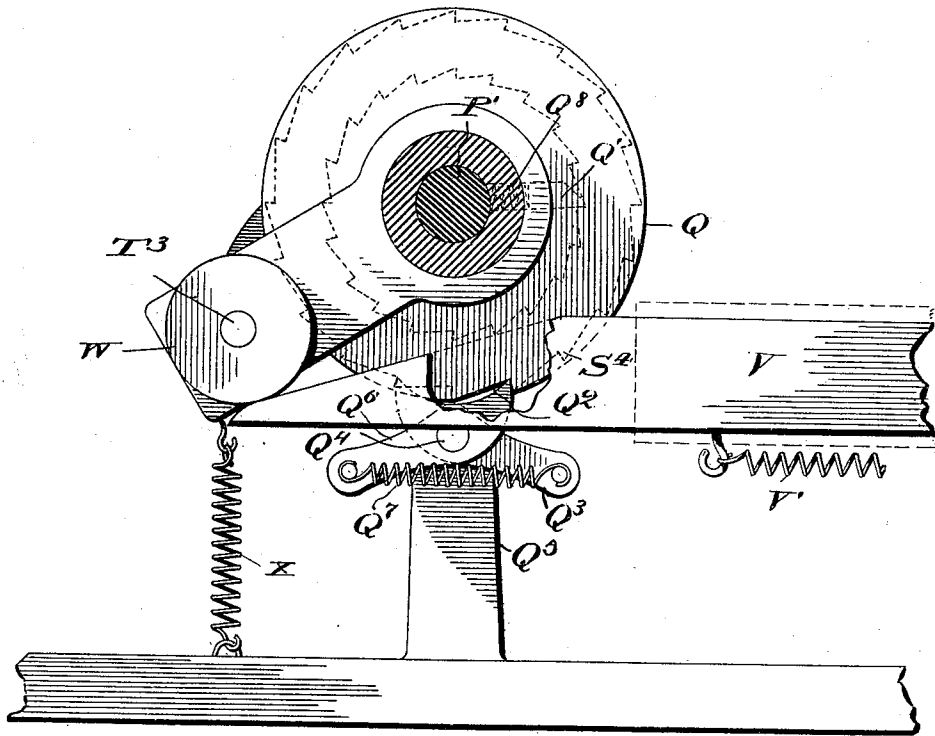
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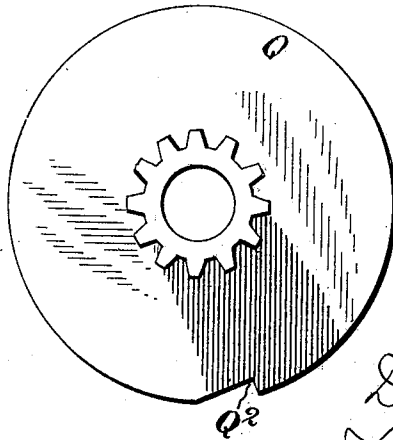
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~~Fig. 25.~~



~~Fig. 25.~~



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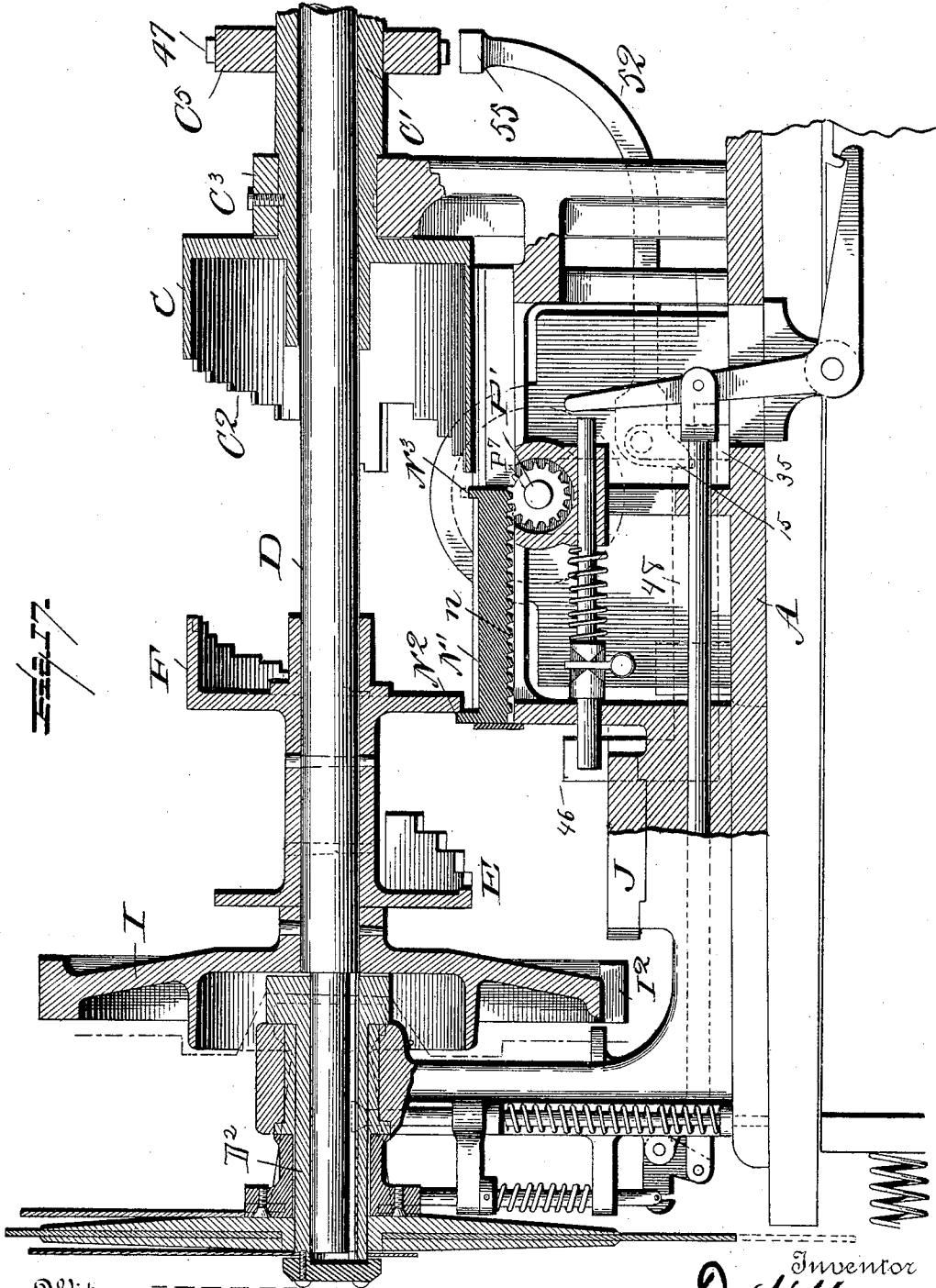
Patented July 23, 1901.

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(Application filed Feb. 25, 1899.)

(No Model.)

11 Sheets—Sheet 11.



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# UNITED STATES PATENT OFFICE.

DANIEL W. HARPER, OF MEMPHIS, TENNESSEE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TOLEDO CASH REGISTER COMPANY, OF DOVER, DELAWARE.

## CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 679,075, dated July 23, 1901.

Application filed February 25, 1899. Serial No. 706,823. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL W. HARPER, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Cash-Registers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in cash-registers, and especially to a rotary register in which a total-adding mechanism is employed which is actuated at each operation of the machine in effecting a registration; and in carrying out the invention it is my aim to generally improve upon my cash-register upon which I have made an application for Letters Patent, Serial No. 657,268, embodying principles which are brought into combination with the features forming the subject-matter of the present application.

The invention relates, further, to the provision of a total-adding mechanism which is actuated automatically as the extensible operating-shaft is moved longitudinally, means being provided to cause a type-wheel to be rotated, so as to present the type for the amount of the registration in a suitable position in which a printing-strip may receive an impression from said type by means of a platen, which is actuated by the pulling out of the operating-shaft, striking the strip of paper to be printed and forcing the latter against the face of the type, between which and the platen is interposed a suitable inked ribbon. In connection with the check-printing mechanism I provide means for advancing the strip of paper receiving the impression and for cutting off the check.

Another part of the invention resides in the provision of a total-adding mechanism for cash-registers, which is actuated by means of connections with a longitudinally-movable operating-shaft, on which is mounted to rotate therewith a stationary type-wheel adapt-

ed to present the type corresponding to the amount to be registered in such a position as to make an impression on a check-strip, also on a continuous detail transparent strip, by means of an automatically-operated hammer striking said strips against the face of the type, between which hammer and type the strips are previously interposed, a suitable inking-ribbon also being interposed between the strips, and mechanism for advancing the strips after being printed, one of these strips forming a continuous detail of all of the registrations printed, which forms a check on the total-adding mechanism, while separate impressions of each amount printed on the check-strip are cut off and deposited at a location convenient to the hand of the operator.

Further details of this invention will be hereinafter fully described, and then defined in the appended claims.

I clearly illustrate my invention in the accompanying drawings, which with the characters of reference marked thereon form a part of this application, and in which drawings similar characters of reference indicate like parts throughout the several views, in which—

Figure 1 is a top plan view of the mechanism comprising the present invention, the same showing the top of the case removed. Fig. 2 is a front elevation of the check-printing attachment. Fig. 3 is a central vertical section through the check-printing mechanism. Fig. 4 is a rear elevation of the mechanism for actuating the knife which cuts off the checks containing the printed amount which has been registered. Fig. 5 is a side elevation of a portion of the machine, showing the longitudinally-movable shaft, the printing-wheel turning therewith, the tilting platen, and mechanism for actuating the same. Fig. 5<sup>a</sup> is a side elevation of a portion of the circumferentially-grooved wheel which is mounted on the extensible operating-shaft. Fig. 6 is a top plan view of the cutting-knife. Fig. 7 is a perspective view of the geared wheel, which has a cam on a shoulder thereon, which is adapted to trip the cutting-knife. Fig. 8 is a detail view of a bearing-plate forming a portion of the check-printing mechanism. Fig. 9 is a detail in perspective of a lever for raising one of the contact-rollers

which bears against the printing-strips. Fig. 10 is a horizontal section through the total-adding mechanism, showing in elevation the pinion-wheels and shaft carrying the same.

5 Fig. 11 is a vertical cross-section taken on line 11 11 of Fig. 10 looking in the direction indicated in the arrow. Fig. 12 is a vertical section on line 12 12 of Fig. 10. Fig. 13 is a cross-section on line 13 13 of Fig. 10. Fig. 14 is a cross-sectional view on line 14 14 of Fig. 10. Fig. 15 is a vertical section on line 15 15 of Fig. 10. Fig. 16 is an elevation of the disk, which is integral with the sleeve, which has formed at one end the pinion-wheel adapted to mesh with the sliding rack-bar. Fig. 17 is a vertical longitudinal sectional view through the operating-shaft and the stepped shells mounted thereon, showing in elevation, partly in dotted lines, the platen and means for operating same. Fig. 18 is a top plan view of the rack-bars and lugs thereon. Fig. 19 is a sectional view longitudinally through a rack-bar, showing one bar in elevation.

25 Reference now being had to the details of the drawings by letter, A designates the casing of the register, which is shown only in section in order to better illustrate the operative mechanism of the register, and mounted in said casing is the frame B, which supports the operative mechanism, in the upright portion of which frame is journaled the hub portion C' of the hollow cylindrical shell C, which has its marginal edge formed into a series of steps C<sup>2</sup>. This shell is provided for a purpose which will be hereinafter described in detail. The hub portion C' is journaled in a bearing C<sup>3</sup>, carried by an upright portion of the frame, which bearing is interposed between the end of said shell C and the hub C<sup>4</sup> of the type-wheel C<sup>5</sup>. Mounted in the hub is one end of the operating-shaft D, which is splined thereto, while the opposite end of said shaft is mounted in a sleeve D<sup>2</sup>, in which the inner end of said shaft is splined. From this construction it will be seen that the said sleeve and shaft D and the shell C, with hub C', are caused to rotate together, the inner end of the operating-shaft being contracted and allowed

50 a longitudinal or telescoping movement within said sleeve, which longitudinal movement is necessary in the operation of my check printing and adding mechanism, said shaft having also a longitudinal movement through the shell C, to which it is splined, as will be readily understood. Keyed or otherwise mounted on said shaft, so as to rotate with the same, are the hollow cylindrical shells E and F, which have their circumferences broken away and stepped, as at E' and F', respectively. These steps are provided to actuate a trip member which in turn causes mechanism to be operated which will effect the registering of a purchase amount, and

65 each step of the shell E, which is provided to register a purchase amounting to one dollar or more, represents a numeral—i. e., in

the drawings there are illustrated on said shell five steps, the first step representing one dollar and the fifth five dollars—and the steps are graduated in a spiral direction extending about only a portion of the circumference of the shell, leaving a blank portion at E<sup>2</sup> of the shell, at which place the cylinder is entirely cut away. This blank space extends about a portion of the circumference of the head of said shell. The second shell F, of slightly-larger diameter than shell E, is utilized when it is desired to register purchases amounting to cents and is similarly constructed, but has more steps, the first of which represents the purchase amount of five cents and the highest ninety-five cents. This shell has also a blank space F<sup>2</sup>, having no steps, which space is equal to that taken up by the steps on the shell E, and the two shells E and F are so keyed or otherwise fastened to the operating-shaft with relation to each other that when the steps on the shell E, for instance, are turned for engagement with the lug on the sliding rack-bar beneath the blank portion of the shell F will be presented adjacent to said lug, so as to pass over the same without striking it, and vice versa, when the shell F is brought forward for engagement with a lug which will actuate mechanism designed to register purchases amounting to cents. Keyed to the shaft D is a wheel I, which has a series of recesses I' about its circumference, the walls of which recesses taper, as seen at I<sup>2</sup>. Mounted on a suitable portion of the frame of the register is a block J, (shown in Fig. 5 of the drawings,) the forward end of which, or the end which is adjacent to said wheel I, is tapered, as seen at J'. This member J is held in a horizontal position and is provided as a guide over which the recesses in said wheel I are adapted to pass, so as to hold the wheel and the shaft carrying the same from rotation while the operating-shaft is being moved longitudinally for the purpose of registering a purchase amount. These recesses are disposed at equal distances apart about the circumference of the wheel, and one is provided for each step on the shells which are keyed to the operating-shaft, so that at whatever position the shaft is stopped in the act of indicating any purchase amount the wheel I will hold the shaft rigidly while the registering mechanism is being operated.

At the outer end of the operating-shaft is a knob D', whereby said shaft may be rotated and worked longitudinally. On this shaft is to be mounted the indicating-pointer, which is adapted to register with a dial carried on the outer face of the register, which parts, however, are not shown in the drawings, as they form no part of the present invention, but are included in and covered by my pending application, Serial No. 657,268. This shaft also actuates an indicating-dial Z, which is shown in section in Fig. 5.

Mounted in the frame of the machine and

adapted to have a longitudinal movement in suitable guideways therein are the rack-bars N and N'. These rack-bars are provided with teeth *n* on their under faces, and the bar N, which is provided to actuate mechanism for registering purchases amounting to dollars, has two upwardly-extending lugs or trips N<sup>2</sup> and N<sup>3</sup>, the former of which is longer than the lug N<sup>3</sup> for the purpose of allowing the steps on the shell E, which is of less diameter than shell F, to strike said lug N<sup>2</sup> and advance the rack-bar carrying the same, said rack-bar being returned to its starting position by the end of the shell F. The second of said rack-bars N' has two lugs N<sup>4</sup> and N<sup>5</sup>, the former of which is shorter than lug N<sup>5</sup> for the purpose of allowing the steps of the shell E to pass freely over said lug when the steps on the shell F are turned, so as to engage with the lug N<sup>5</sup>, carried by said rack-bar N'. As the shell F returns to its starting position its rear end strikes against the lug N<sup>4</sup>, carried by the rack-bar N', which causes a rotary movement to be imparted to the registering mechanism, indicating purchases from five to ninety-five cents. The said rack-bars N and N' are held in place in any suitable manner, and the rearward throw of each of said bars may be limited by means of a plate or any other suitable stop disposed across the path of the racks, and the forward throw of each of said rack-bars is limited by a particular step C<sup>2</sup> of the shell C, which step may be turned in such a position in the rotating of the operating-shaft so that it will come in alinement with the end of the particular rack-bar which is drawn forward when the shaft is pulled out in the act of registering a purchase amount. Mounted on the rods C<sup>3x</sup>, carried by the shell C, which rods pass through the head of the shell F, are coiled springs C<sup>4</sup>, which are provided to throw the shaft carrying said shells back to its normal position. The steps on the shell C are so arranged with reference to the steps on the shells E and F that they will always have the same relative position to one another, and when any particular step on the shells E and F is turned to strike a lug to actuate one of the rack-bars a corresponding step C<sup>2</sup> on the rotary shell C will be turned so as to come in alinement with and be presented in the path of the lug carried by the particular rack-bar that is being driven forward, thus forming a stop against which step C<sup>2</sup> the lug strikes to limit its forward movement.

Journalled in a portion of the framework of the machine is a sleeve P<sup>5</sup>, in which is journalled the shaft P'. This shaft P' is journalled at its outer end in the bearing P<sup>3</sup>, as shown in Fig. 10 of the drawings. Integral with one end of the said sleeve is a pinion-wheel P<sup>6</sup>, the teeth of which are adapted to mesh with the teeth on the under side of the rack-bar N'. At the opposite end of said sleeve is the enlarged integral disk Q, in the circumference

of which disk is a notch Q<sup>2</sup>, which is shown clearly in Fig. 15 of the drawings, in which said notch is shown as engaged by the free end of the spring-actuated pawl Q<sup>6</sup>, which is pivoted to a stud Q<sup>4</sup>, mounted on the stationary post Q<sup>5</sup>, forming a part of the frame of the register. Mounted in an aperture leading from the bore of said sleeve through the shouldered portion Q<sup>x</sup>, forming a part of the disk, is a spring-actuated pawl Q', held at its farthest outward throw by means of the coiled spring Q<sup>8</sup>, which is clearly shown in Figs. 10 and 15 of the drawings. Loosely journalled on the shaft P' is a registering-wheel R, which carries a series of numerals about its circumference, and securely fastened to or integral with said registering-wheel are the two ratchet-rings S and S', which are provided with external and internal teeth, the teeth on the external circumference of which rings are reversely arranged with reference to each other, as clearly shown in Fig. 11 of the drawings. These ratchet-rings are shown as being held to the registering-wheel R by means of bolts R', but may be fastened thereto in any other suitable way, if desired; or said reversely-arranged series of ratchet-teeth may be formed, if desired, of a part of said registering-wheel. Pivoted on a common pivot Q<sup>4</sup>, with the pawl Q<sup>6</sup>, is a second pawl Q<sup>3</sup>, which is adapted to mesh with the teeth S<sup>3</sup> on the circumference of the ring S. This pawl Q<sup>3</sup> is held normally in engagement with said teeth by means of the spring Q<sup>7</sup>. (Shown in Figs. 11 and 15 of the drawings.) The free end of said pawl Q<sup>3</sup> engages with the teeth S<sup>3</sup> on the outer periphery of the ring S. It will be noted that the free end of the pawl Q<sup>6</sup> when in its normal or starting position also engages with the single notch Q<sup>2</sup> in the periphery of the disk forming a part of the sleeve P<sup>5</sup>. It will also be noted that the pawl Q' normally engages with the teeth on the inner rim of the ratchet-rings S and S' and is allowed to turn idly over the ratchet-teeth when the rack-bar N' is drawn forward in the act of rotating the sleeve carrying said pawl, but to engage with the teeth on the inner circumference of said rings when rotated in the opposite direction, which causes the registering-wheel R to rotate in effecting a registration. The pawl Q<sup>3</sup> engages with the teeth in the outer circumference of the ratchet-ring S and allows the registering-wheel R, connected to said ring, to rotate only in one direction, that direction being the same as the motion which is imparted to the sleeve as the rack-bar actuating the same is thrown back to its starting position. As the rack-bar N' is thrown back to its starting position and in such movement rotating the sleeve the registering-wheel will be carried with the sleeve until the pawl Q<sup>6</sup> is allowed to fall into the single notch Q<sup>2</sup>, and as the said pawl Q<sup>6</sup> falls into the notch Q<sup>2</sup> it will also fall into one of the teeth of the ratchet-ring S', which tooth has come in alinement with said single notch in disk Q, which will

form a positive stop and prevent any further rotary movement to the registering-wheel. Loosely mounted on said shaft P' is a bail T, the ends of which are journaled, one as at T' 5 and the other at T<sup>2</sup>, about the circumference of the sleeve. Mounted in this bail is a shaft T<sup>3</sup>, on which is carried a collar T<sup>4</sup>, having a suitable set-screw and a spring-actuated pawl T<sup>6</sup>, is either carried by or forms a part of said 10 collar, and said pawl is actuated by means of a spring T<sup>5</sup>, (shown clearly in Figs. 10 and 13 of the drawings,) one end of said spring engaging with the bail and the other bearing against said pawl. Mounted on the upright 15 post B<sup>2</sup> of the frame on a stud B<sup>3</sup> is an angle-lever H, one end of which is notched, as at H', and has an upwardly-projecting arm H<sup>2</sup>, which is adapted to project into the path of and be struck by a lug R<sup>2</sup>, carried by the 20 registering-wheel R, said lug being adapted to strike the arm H<sup>2</sup> at each revolution of the registering-wheel R. The outer swinging portion of said bail is adapted to normally rest in the notched portion H' of said lever H, and as said lever is tilted on its bearing B<sup>3</sup> 25 the portion of the lever supporting the bail is thrown back and allows the latter to fall by gravity to the position shown in dotted lines in Fig. 13 of the drawings.

30 Keyed to the shaft P' is a disk G, which is similar in construction to the integral disk Q, forming a part of the sleeve P<sup>5</sup>. This disk G is provided with a spring-actuated pawl G', mounted in an aperture in the shoulder of said disk, and securely fastened to said 35 disk are the two ratchet-rings G<sup>2</sup> and G<sup>3</sup>, which are held to a registering-wheel J by means of the bolts J'. Said ratchet-ring G<sup>2</sup> has a series of ratchet-teeth G<sup>4</sup> about its outer 40 circumference and a row of teeth G<sup>5</sup> about its inner circumference, and about the circumference of the ratchet-ring G<sup>3</sup> is a series of teeth G<sup>6</sup>, which teeth are reversely arranged to the teeth G<sup>4</sup> about the outer 45 circumference of the ratchet-ring G<sup>2</sup>, while the inner circumference of the ratchet-ring G<sup>3</sup> has teeth G<sup>7</sup>, which are in alinement with the teeth G<sup>5</sup> on the inner circumference of the ratchet-ring G<sup>2</sup>. In these teeth G<sup>5</sup> and G<sup>7</sup> is 50 adapted to engage the pawl G', which pawl rides idly over the ratchet-teeth when the disk G is rotated in the forward throw of the rack-bar N, which rack-bar, meshing with the pinion P<sup>7</sup>, keyed to the operating-shaft 55 P', will cause the latter to rotate. Integral with said disk G is the flange G<sup>8</sup>, which has a single notch G<sup>9</sup> in its circumference, which notch is normally engaged by the pawl K, which pawl is also designed to engage with 60 the teeth G<sup>6</sup> on the outer circumference of the ratchet-ring G<sup>3</sup>. This pawl K is mounted on the stud K', which forms a common bearing for the pawl M, the ends of which pawls are connected by means of a spring M', which 65 spring is provided to throw the free ends of said pawls in engagement with the two series of reversely-arranged teeth G<sup>4</sup> and G<sup>6</sup>.

The rear end of the pawl K carries a lug K<sup>2</sup>, which engages in an elongated aperture h in the lever H. By this connection of the 70 pawl K to lever H, the free end of which pawl normally engages with the teeth G<sup>6</sup> on the outer circumference of the ratchet-ring G<sup>3</sup>, said pawl will be thrown out of engagement with said teeth as the lever H is thrown 75 back by means of lug R<sup>2</sup> striking the arm H<sup>2</sup>. Said pawl K being thus thrown out of engagement with the ratchet-teeth is held in such position, while the bail T is at its lowest limit, as shown in dotted lines in Fig. 13 of 80 the drawings, in which position the outer end of the bail will hold the lever H in its outwardly-tilted position, while the registering-wheel J is being advanced one notch, which partial rotation of said registering- 85 wheel is effected by the following mechanism: Mounted on the end of the shaft T<sup>3</sup> is a roller W, which is disposed in the path of the wedge-shaped end of the longitudinally-movable member V, which at each outward 90 pull of the operating-shaft is driven forward by the wheel I striking against the end of said member V, and when the bail carrying said wheel is at its lowest limit the inclined or upper edge of the wedge-shaped member 95 V strikes said wheel and raises the latter to its normal position or to the position shown in Fig. 13 of the drawings. Secured to said member V is a spring V', the other end being 100 attached to a stationary part of the frame, which is provided to draw back said member to its starting position. As the bail T, to which may be secured a coiled spring X, in order to assist in pulling down said bail to its 105 lowest limit, is caused to fall, the pawl carried by the bail will turn idly over a single tooth and be in readiness to rotate the registering-wheel, to which is secured the ratchet-ring engaged by said pawl, and as the member V is driven forward the bail is raised to 110 its starting position and the free end of the pawl K is thrown into one of the notches in the ratchet-ring G<sup>3</sup>. When the ratchet-rings are in this position, in which the pawls K and M are engaging with the reversely-ar- 115 ranged teeth, about the circumference thereof, the registering-wheel J is securely held from rotation in either direction and retained in such position until the registering-wheel R, which carries a lug R<sup>2</sup>, makes a complete 120 revolution, which will again trip the lever H, allowing the bail carrying the pawl to fall, so that its pawl will engage with an adjacent tooth in the ratchet-ring G<sup>3</sup>, in readiness to impart a partial revolution to said register- 125 ing-wheel J as the extensible shaft is operated or until said registering-wheel J is caused to effect a registration in its rotary movement by the manipulation of the rack-bar N, which meshes with the pinion P<sup>7</sup>, 130 keyed to the shaft P', in which latter case when the shaft P' is rotated in the act of registering purchases amounting to dollars, the one-notch flange G<sup>8</sup> will turn with the shaft,

throwing the pawl K out of engagement with the single notch of the flange G<sup>2</sup>, also out of engagement with the tooth in the ratcheting G<sup>3</sup>, the slight tilting movement thus imparted to the pawl K being allowed without dropping the bail T by reason of the lug K<sup>2</sup> carried thereby having a limited play in the slot in lever H. Upon reference to Fig. 1 of the drawings it will be observed that the said wedge-shaped member V is driven forward by means of its rear end being struck by the wheel I as the extensible shaft is drawn out.

Mounted on a shaft U, which is supported by brackets on the frame of the register behind the registering-shaft, is an angle-wheel U<sup>1</sup>, which has integral therewith a cog-wheel U<sup>2</sup>, and said angle-wheel has a plurality of teeth U<sup>3</sup>, between which the circumference of said wheel is concaved, as is common in intermittent gear-wheels, a view of a similarly-constructed wheel being shown in Fig. 12 of the drawings. Secured to the frame of the registering-wheel J is a disk J<sup>2</sup>, which has a single notch J<sup>3</sup> in its circumference, and secured to said disk J<sup>2</sup> is a notched plate J<sup>4</sup>, having a notch J<sup>5</sup>, which is in alinement with the notch J<sup>3</sup> in said disk J<sup>2</sup>. The curved surfaces between the teeth U<sup>3</sup> on said angle-wheel are adapted to contact with the circumference of said disk J<sup>2</sup>, and at each revolution of the registering-wheel J, carrying the disk J<sup>2</sup>, one of the teeth U<sup>3</sup> of said angle-wheel will engage in the tooth J<sup>3</sup>, and at the same moment one of the teeth of the cog-wheel U<sup>2</sup> will engage with the notch J<sup>5</sup> in plate J<sup>4</sup>, and in the further rotation of the said disk J<sup>2</sup> it will be noted that the angle-wheel will cause a partial revolution to be made to the pinion-wheel mounted on the shaft U, and after the notch J<sup>3</sup> in said disk has passed the tooth U<sup>3</sup> of the angle-wheel a concaved portion of the angle-wheel will ride on the circumference of said disk and prevent the latter from imparting a rotary movement to the angle-wheel until said disk has made another complete revolution.

Mounted loosely on the shaft P' is a third registering-wheel J<sup>6</sup>, which is provided with a disk J<sup>7</sup>, secured to its face adjacent to the pinion-wheel U<sup>2</sup>. This disk J<sup>7</sup> has a series of cog-teeth about its circumference, which are normally in mesh with the teeth of the pinion U<sup>2</sup>, and at each partial revolution of said pinion-wheel the registering-wheel J<sup>6</sup> will be caused to rotate one notch. Mounted on the outer face of the registering-wheel J<sup>6</sup> is a disk J<sup>8</sup>, having a single notch, (not shown, but similar to notch J<sup>3</sup>), and said disk has secured to its face a plate J<sup>10</sup>, having a single notch J, (shown clearly in Fig. 12,) which notch is in alinement with the single notch in the circumference of the said disk J<sup>8</sup>. Mounted on the shaft U is an angle-wheel J<sup>12</sup>, which is integral with a pinion-wheel J<sup>13</sup>, which angle-wheel and pinion are similar in construction to angle-wheel U<sup>1</sup> and pinion U<sup>2</sup>, here-

inbefore described. The concaved surfaces between the teeth J<sup>14</sup> of the angle-wheel J<sup>12</sup> are adapted to contact with the circumference of said disk J<sup>8</sup> during the rotary movement of the latter, and when the notch in said disk J<sup>8</sup> comes opposite a tooth J<sup>14</sup> on the angle-wheel J<sup>12</sup> said tooth will turn down into the notch in the disk J<sup>8</sup> and one of the teeth of the pinion J<sup>13</sup> will turn in the notch in the plate J<sup>10</sup>, thus causing a partial rotary movement to the pinion, which in turn transfers its motion to a fourth registering-wheel J<sup>15</sup>, which is provided with a disk J<sup>16</sup>, with a series of cog-teeth about its circumference. About the circumference of these registering-wheels are arranged numerals in such an order that all of the registrations which are made in the operation of the register will be added up and be visible at suitable sight-apertures in a casing surrounding said registering-wheels, but which casing has not been shown.

Mounted within the casing of the register is a frame 1, supporting the operating-rollers of the check-printing mechanism. In this frame are held the spindles 2 and 3, on which are journaled the spools 4 and 5, on which the inking-ribbon 6 winds. This ribbon, which unwinds from one spool 4 and winds upon the other 5, passes from spool 4 underneath spool 5, thence over roller 7, and in a horizontal direction over roller 8, thence back underneath roller 9, and is wound up on spool 5.

The strips of paper to be printed are designated by numerals 10 and 12, the former of which is the check-printed strip and is mounted upon a spindle 13. (Shown in Fig. 1 of the drawings.) The spindle 13 is loosely held in place in the slots 14, (shown in Fig. 1,) similar to the slot 23<sup>x</sup>. (Shown in Fig. 2.) By having said spindle carrying the check-printing strip loosely held in said guide-slots the spindle may be readily removed to replenish the supply of paper, and the roll of the check-printing strip will work down by gravity, keeping the strip taut over the roller 15, mounted stationary in the frame underneath the spindle 13. Journaled in the upright posts 16, secured to the casing of the register, is the diagonally-disposed roller 17, over which the paper is fed and caused to make a right-angled turn in its forward progress. Said check-strip after passing over the roller 17 passes under roller 17<sup>x</sup>, over the roller 7, thence underneath roller 8, and over roller 18, after which it is cut off by an automatically-operated knife, which will be presently described.

The continuous detail-strip 12, which is preferably of a transparent or partially transparent paper, unwinds from the roller 19, journaled on a spindle 20, which is mounted on a portion of the frame of the machine, and said strip is passed underneath the roller 9, above the two folds of the inking-ribbon, underneath roller 21, over the roller 22 and underneath the friction-roller 23, and may then



pass over a roller 24 and allowed to accumulate within the casing, from which it may be removed at any time in order to compare the detail amounts of the purchases, which strip  
 5 may form a check upon the total-adder, which has been hereinbefore described and which forms a part of the present invention. This strip is made, preferably, of a transparent or nearly transparent material, so that the im-  
 10 pressions of the type which are printed on the under surface of said strip may be read through the strip as positive numerals. Fastened to and turning with spool 19, on which the transparent detail-strip is wound, is a cog-  
 15 wheel 25, the teeth of which mesh with the teeth of a cog-wheel 26, which is secured to the spindle 3, on which the inking-ribbon is wound. Mounted on the spindle 27 is a friction-wheel 28, to which spindle is secured the  
 20 cog-wheel 29, the teeth of which are adapted to mesh with the teeth of the cog-wheel 30, and mounted in the upwardly-extending arms of the frame is a shaft 31, which carries at its inner end a cog-wheel 32, designed  
 25 to mesh with the teeth of the cog-wheel 30, while at the outer end of said shaft is keyed an operating-handle 32<sup>x</sup>. Mounted on the said shaft 31 is a ratchet-wheel 31<sup>x</sup>, having teeth about its circumference which are de-  
 30 signed to engage with a pawl 33, which is pivoted on the frame of the machine, and has secured at its rear end a spring 34, which spring is adapted to normally throw the free end of said pawl into the teeth of said ratchet-  
 35 wheel, so as to allow the shaft 31 to rotate only in one direction for the purpose of imparting a rotary movement to the rollers, and mechanism for advancing the strips of paper being  
 40 printed and the inking ribbon, in the courses described. Integral with the cog-wheel, which is carried by the spindle 27, is a shoulder 36, which has a single tooth 37 on its circumfer-  
 45 ence, and integral with said shoulder is a cam 38. Said tooth 37 at each revolution of the wheel carrying the same is adapted to mesh with one of the notches 39 in the intermittent  
 50 wheel 40, which is carried on the shaft carrying the roller 22 and causes a partial revolution to said roller 22, which will advance the strip of paper 12, which has been previously  
 55 printed. The outer circumference of said roller 22 and the contact-roller 23 may have a portion of their circumference milled and between which the said strip of paper 12 passes  
 60 and is slightly advanced at each partial revolution of the roller 22. Mounted on the pivots 42 in each side of the framework of the check-printing mechanism are the lugs 43, which are integral with the plate 44. The  
 65 said plate has its upper end forked, forming arms 45, which extend underneath the friction-roller 23, which roller is held yieldingly against the roller 22 by means of springs 46, which are held to the framework by means of the screws 47<sup>x</sup>. (Shown clearly in Fig. 3 of the drawings.) By this provision of the plate 44 it will be noted that when the lower end of

the same is pushed forward said friction-roller 23 is raised from contact with the strip of paper 12, and the roller 22 allows said strip 12  
 70 to be drawn forward over the rollers when it is desired to tear the strip off containing the detail registrations that have been printed on the same. Mounted on the main operating-  
 75 shaft and adapted to rotate with the same is a type-wheel C<sup>5</sup>, about the circumference of which are arranged the type 47, the type for the figures representing purchases from  
 80 naught to ninety-five cents being arranged on one side of the central line about the circumference of said wheel, while the type representing purchases amounting to dollars are  
 85 arranged in a parallel row on the opposite side of the central line, whereby when purchases amounting to dollars and fractional  
 90 parts thereof are printed upon the check and detail strips the figures representing the total amount will read in the same line. Mounted in the upright portion of the frame supporting the registering-shaft is a block or bar 48,  
 95 which has a slight longitudinal movement, and the rear end of said block or plate has an upwardly-projecting portion 49, which is disposed in the path of the wheel I, said upwardly-projecting portion being adapted to  
 100 be struck by said wheel I when the extensible shaft draws said wheel out to its limit. The opposite end of said bar 48 is reduced, forming a shoulder 50, which is designed to contact with the projecting end 51 of the platen 52,  
 105 which is pivoted at 53 to the upright portions 54 of the framework. The outer free end of said platen has an enlarged and flattened portion 55, which as the operating-shaft is driven forward causes the platen to be thrown up  
 110 against the type on the type-wheel, and as the detail and check printing strips, together with the two folds of the printing-ribbon, are interposed between the platen-head and the face of the type it will be noted that impres-  
 115 sions of the type will be printed on the upper face of the check-printing strip and on the under face of the detail transparent strip, thus making the numerals which are printed on the detail-strip clearly visible as positive  
 120 numerals through the paper. Securely held in a horizontal position is a plate 56, having a cutting edge 57, against which the pivoted knife 58 is adapted to shear as said knife turns on its pivot. To the outer end of said  
 125 knife is connected one end of the spring 59, the other end of said spring being secured to the casing, as at 60, this spring being provided to hold the said knife normally in the position shown in Fig. 6 of the drawings. At  
 130 the pivoted end of said knife is a projection 61, which is disposed in the path of the cam 38, and at each revolution of the wheel carrying said cam the latter is adapted to strike against the projection 61 and cause the check on which the amount of registration has been printed to be cut off, said check after being cut falling to an aperture, from which it may be readily withdrawn. In order

to allow the roller 18 to tarry slightly while the knife is cutting the check-strip, it is my purpose to flatten a portion of the roller 28, as shown at 62, which flattened portion is presented adjacent to the roller 18 while the knife is being actuated by the cam tripping the same. The ribbon which winds about the roller 8 is guided thereon between shoulders on said roller, as seen in Fig. 8, which latter is mounted in arms 8<sup>x</sup>, which are carried about the spindle supporting the roller 27. The crank 32<sup>x</sup> is allowed to be turned by depressing the spring-actuated lever 70, which is pivoted to the frame, so that its free end will rest normally in the path of said crank, but may be depressed by the thumb of the operator as he grasps the crank-handle, thus allowing the crank to make a complete revolution.

In operation the shaft which carries the indicating-pointer is first rotated so that the pointer will indicate the amount desired to be registered, and as said shaft rotates the particular step on the wheel E or F, which step corresponds with the particular numeral sought to be registered, is turned so that the said step will come in alinement with the particular rack-bar N or N', accordingly as purchases amounting to dollars or cents are to be registered. In the rotation of the shaft the shell C, which is keyed to it, will present the proper stop in alinement with the lug at the forward end of the rack-bar which is to be driven forward. The type-wheel C<sup>5</sup>, which has about its circumference the type, will be turned so that a numeral or numerals corresponding to the amount which is to be registered will come on the under side of the said wheel and directly above the platen 52, between which platen and type-wheel have been previously disposed the detail and check-printing strips, together with the inking-ribbon. When the shaft has been rotated so that the parts connected therewith will assume the position described, the machine is in readiness to have its extensible shaft pulled out, and in the latter operation one or the other of the rack-bars carrying the lugs on their upper surface will be driven forward to such a distance as will be limited by the particular step on the shell C which is disposed in the path of the lug carried by the plate being driven forward. As the shaft is drawn forward the wheel I, carried thereby, is adapted to strike against the longitudinally-movable plate or bar 48, which will cause the outer end of the platen to be thrown up against the strips to be printed and the interposed inking-ribbon with sufficient force to cause an impression to be made on the check-printing strip as well as on the detail transparent strip. On the return movement of the operating-shaft to its starting position the rack-bar which has been drawn forward will cause the registering-mechanism to be operated. For instance, if the rack-bar N' is being actuated to reg-

ister purchases amounting to less than one dollar, in the forward movement of said rack-bar N' the sleeve P<sup>5</sup> will be caused to rotate outward or in a direction which will cause the pawl Q' to turn idly on the ratchet-teeth on the inner circumferences of the ratchet-rings S and S'. As the disk forming a part of said sleeve begins to rotate the pawl Q<sup>6</sup> will be thrown out of the single notch in said disk, also out of the path of the teeth in the ring S', and will be held out of engagement with said teeth S' as the end of said pawl rides on the circumference of the disk. When the rack-bar has been withdrawn to its limit and the operating-shaft returns to its starting position, the rear end of the shell F, coming in contact with the lug at the rear end of the rack-bar N', will cause said rack-bar to return to its starting position and rotate the sleeve in a reverse direction from that imparted to it as the rack-bar is drawn forward. In said reverse motion which is imparted to the sleeve it will be observed that the registering-wheel R will be caused to rotate with said disk forming a part of the sleeve by reason of the pawl Q' engaging with the teeth of the ratchet-rings S and S'. The pawl Q<sup>3</sup>, which normally engages with the reversely-arranged teeth about the circumference of the ring S, will prevent any backward rotation of the said registering-wheel, and the pawl Q<sup>6</sup>, which is riding on the rim of the disk, is held out of engagement with the teeth on the ring S', allowing the ratchet-rings and registering-wheel, together with the disk, to rotate until the single notch Q<sup>2</sup> in the disk comes back to its starting position, in which position the free end of the pawl Q<sup>6</sup> will be thrown into the notch and will prevent any further momentum to the registering-wheel. This operation is repeated in making successive registrations, and at each revolution of the registering-wheel R, which carries a lug R<sup>2</sup> thereon, said lug R<sup>2</sup> will strike against the upwardly-projecting arm H<sup>2</sup> of the lever H, which arm is disposed in the path of said lug, and said lever will be tilted, allowing the bail T, carrying a pawl engaging with the teeth on the outer circumference of the ratchet-ring G<sup>2</sup>, to fall in the position shown in dotted lines in Fig. 13 of the drawings. As said lever H is tilted out so that its arm will clear the lug R<sup>2</sup> the pawl K, which has a lug K<sup>2</sup> engaging in an aperture in the lever, will have its free end thrown out of the notch, and the registering-wheel G is in position to be rotated one notch when the operating-shaft is drawn forward the next time. As the shaft is drawn forward the wheel I will strike against the wedge-shaped member V, the inclined edge of which will strike against the roller W, carried by the shaft in the swinging bail T and raise said bail to its normal position. As the bail is being raised the pawl carried thereby will cause the registering-wheel to rotate one notch, which movement imparted to the

registering-wheel G will cause the highest amount which can be registered on the wheel R (which is ninety-five cents) to be transferred to the wheel J. While the bail is in position shown in dotted lines in Fig. 13 it will be observed that the free end of the pawl K will be held out of the path of the teeth about the circumference of the ring G<sup>3</sup>, which will allow said ring G<sup>3</sup> to be driven forward as the bail is raised to its starting position. As the bail reaches its highest limit the shoulder II' on said lever is thrown underneath the same and the pawl K is automatically thrown back into a tooth in the ring G<sup>3</sup>, thus positively holding the registering-wheel J from further rotation. At each revolution of the registering-wheel J, which has a disk secured to its face, one of the teeth U<sup>3</sup> on the angle-wheel, which is made integral with the pinion-wheel U<sup>2</sup>, will engage in the notch J<sup>3</sup> in the circumference of said disk secured to the registering-wheel and cause a partial revolution to be imparted to said angle and pinion wheel. As the tooth on the angle-wheel engages in the recess J<sup>3</sup> one of the teeth of the pinion-wheel U<sup>2</sup> will engage in a notch J<sup>5</sup>, which is in alinement with the notch J<sup>3</sup> in said disk, which will allow the pinion to turn freely. As the pinion makes a partial revolution the teeth thereof engaging with the teeth on the disk secured to the registering-wheel J<sup>6</sup> will cause the latter to make a forward revolution one notch, sufficient to register the highest amount contained on the registering-wheel J. At each revolution of the wheel J<sup>6</sup> the registering-wheel J<sup>15</sup> is caused to make a partial revolution by a similarly constructed and arranged angle and pinion wheel, as will be readily understood. When it is desired to actuate the rack-bar N in effecting registrations amounting to dollars, the registering-wheel R is idle, and the shaft P' as the said rack-bar N is drawn forward will rotate, and with said shaft the registering-wheel J will turn outward, the pawl carried thereby will ride idly over the teeth on the ratchet-rings G<sup>2</sup> and G<sup>3</sup>, and the free end of the pawl K will be thrown out of the notch which it engages and will ride on the circumference of the flange G<sup>8</sup> of said registering-wheel G, the tilting movement sufficient to throw the pawl out of the notch which it engages being allowed by reason of the lug carried at the rear end of the pawl having a slight play in aperture h in the lever H. As the rack-bar N is driven back to its starting position by means of a lug carried thereon being struck by the rear end of the shell F the shaft P' will be rotated in the opposite direction and the pawl engaging with the ratchet-teeth on the inner rim of the rings G<sup>2</sup> and G<sup>3</sup> will cause the registering-wheel J, connected to said rings, to rotate with it until the notch in the flange G<sup>8</sup> comes back to its starting position, in which position the spring-actuated pawl will be thrown into the notch and positively

hold the registering-wheel from further rotation. This operation may be repeated in each successive registration of numerals amounting to dollars until the wheel J has made one revolution, and at each revolution of the registering-wheel J a partial revolution will be imparted to the wheel J<sup>6</sup> in the manner which has been described.

It will be observed that when registrations are being made of purchases amounting to dollars without using the registering-wheel R the lever K and bail supported thereby are idle and serve no function whatever excepting when registrations are being transferred from the wheel R to the wheel J. By providing the pawls engaging with the oppositely-disposed teeth in the ratchet-rings and the notch in the circumference of said disk and flange a positive lock is provided to prevent rotation of said disk and registering-wheels in either direction until the pawls are operated in the manner described for the purpose of registering the amounts.

After the purchase amount has been printed the operating-handle carried on the shaft 31 is rotated, said rotary movement being allowed by depressing the spring-actuated lever 70, as seen in Fig. 1, which is interposed in the path of the crank connected to said shaft and the detail and check strips are drawn forward, the check-strip, which passes between the rollers 18 and 28, being automatically cut off by the knife 58, which is actuated at each revolution of the wheel carrying the cam 38. At each revolution of said wheel carrying the cam 38 the lug 37, which is integral with a shoulder 36, will cause a partial revolution to be made to the wheel 22, which will advance the detail-strip a sufficient distance to receive the next imprint of the registration that is made adjacent to the last impression, so that the amounts printed on the detail-strip will be adjacent to one another and in columns.

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

1. In a registering mechanism, the registering shaft and wheel, reversely-arranged pawls for normally locking said wheel from rotation in either direction, a disk designed as it is rotated to disengage one of said pawls, to allow the registering-wheel to rotate with said shaft, and means for limiting the rotary movement of said wheel, as set forth.

2. In a registering mechanism for cash-registers, the combination with the registering-shaft of a registering-wheel and ratchet-rings with reversely-arranged teeth thereon, designed to rotate with said wheel, and pawls engaging with the teeth of the ratchet-rings, and means for releasing one of said pawls to allow the registering-wheel to rotate during the registering operation, and for limiting the rotary movement of said wheel, as set forth.

3. In a registering mechanism for cash-registers, the combination of the registering-

wheel, the ratchet-rings, with reversely-arranged teeth, stationary pawls normally engaging with said teeth, the rotary disk with notch in its circumference, in which notch one of said pawls normally engages and is lifted out of said notch and out of the path of the teeth of the notched ring, as the disk is rotated, and means for rotating the registering-wheel, as set forth.

4. In a registering mechanism for cash-registers, the combination of the registering-wheel, the ratchet-rings with reversely-arranged teeth, the pawls engaging with said teeth, the notched disk for throwing one of said pawls out of engagement with the teeth of one of said ratchet-rings, and for forming a momentum-stop to the registering-wheel after a registration has been effected, and a spring-actuated dog engaging with teeth on the inner circumference of said ratchet-rings to rotate the registering-wheel in one direction, as set forth.

5. In a registering mechanism for cash-registers, the combination of the registering-wheel, the ratchet-ring with reversely-arranged teeth, the pawls engaging with said teeth, the notched disk for throwing one of said pawls out of engagement with the teeth of one of said ratchet-rings, and for forming a momentum-stop to the registering-wheel, after a registration has been effected, a spring-actuated dog mounted in the hub of said disk, and normally engaging with the two rows of teeth of the inner circumference of said ratchet-rings, and adapted to ride idly over said teeth when the disk is rotated in one direction, but to rotate the registering-wheel when a reverse motion is imparted to said disk, as set forth.

6. In a registering mechanism for cash-registers, the combination of the registering-shaft, a loosely-mounted internal sleeve and notched disk thereon, means for rotating said sleeve, the registering-wheel and ratchet-rings with reversely-arranged teeth thereon, the spring-actuated pawls normally engaging with said teeth, the circumference of said disk of slightly-larger diameter than that of the ratchet-rings, the spring-actuated dog mounted in a radial aperture in the hub of the disk and designed to engage with the teeth on the inner circumference of said ratchet-rings and ride idly over said teeth when the said sleeve is turned in one direction, and when turned in the reverse direction to rotate the registering-wheel, as set forth.

7. In a registering mechanism for cash-registers, an extensible operating-shaft, a sleeve in which one end of said shaft is splined, a driving-wheel keyed to said operating-shaft, combined with the registering-shaft and gear mechanism for rotating the registering-shaft in opposite directions as the operating-shaft is moved longitudinally, a registering-wheel mounted on the registering-shaft, ratchet-rings secured to said wheel, a swinging bail

and pawl carried thereby, which pawl engages the teeth on the circumference of said ratchet-rings, a horizontally-movable tapering member for raising said bail, said member being disposed in the path of the driving-wheel and adapted to be struck thereby as the operating-shaft is pulled out.

8. In a registering mechanism for cash-registers, a registering-wheel, and shaft carrying same, ratchet-rings secured to said wheel, reversely-arranged teeth on said rings, stationary pawls normally engaging with said teeth and locking the registering-wheel from rotation in either direction, combined with swinging bail, and pawl carried thereby, engaging with the teeth of one of said ratchet-rings, a reciprocating member for raising the bail, and means for holding one of said stationary pawls out of engagement with said teeth until the bail is returned to its starting position, as set forth.

9. In a registering mechanism for cash-registers, a registering-wheel and shaft carrying same, ratchet-rings secured to said wheel, reversely-arranged teeth on said rings, stationary pawls normally engaging with said teeth, and locking the registering-wheel from rotation, combined with a swinging bail and pawl carried thereby, which latter engages with the teeth of one of said notched rings, and a rocking lever normally supporting the free end of the bail and means for tripping said lever for releasing one of the stationary pawls and returning the bail to its starting position.

10. In a registering mechanism for cash-registers, the registering-wheel, the shaft carrying same, the operating-shaft, ratchet-rings secured to or forming a part of said wheel, reversely-arranged teeth on said rings, stationary pawls normally engaging with said teeth, combined with a swinging bail and pawl carried thereby, which latter is adapted to engage with the teeth of one of the ratchet-rings, and a rocking lever normally supporting the swinging bail, said lever designed to release one of the stationary pawls, as the lever is tilted to allow the bail to drop, and means for rocking said lever and raising the bail to impart a partial rotary movement to the registering-wheel, as set forth.

11. In a registering mechanism for cash-registers, the registering-wheel, the shaft carrying same, the operating-shaft and means for rotating the registering-shaft as the operating-shaft is actuated, the ratchet-rings, the reversely-arranged teeth thereon, stationary pawls normally engaging with said teeth, combined with a swinging bail and pawl carried thereby, which latter is adapted to engage with the teeth of one of said ratchet-rings, a rocking lever designed to support the swinging bail, and engaging with one of said stationary pawls, and adapted to release the same as the said lever is rocked, and a longitudinally-movable wedge-shaped member for

returning the bail to its normal position supported by said lever, and means for rocking said lever and for operating the said wedge-shaped member, as set forth.

5 12. In a registering mechanism for cash- registers, the combination of the operating and registering shafts, and means for rotating the latter, the registering-wheel, the ratchet- rings and stationary pawls engaging with the  
10 reversely-arranged teeth thereon, the swing- ing bail, the shaft carried by said bail and pawl mounted thereon, an antifriction-wheel on the end of said bail-shaft, and an inclined or wedge-shaped member adapted, as it is  
15 driven forward when the operating-shaft is pulled out, to strike said antifriction-wheel and raise the bail, as set forth.

13. In a registering mechanism for cash- registers, the operating-shaft, the registering- wheel and shaft carrying same, the ratchet- rings secured to said wheel, the bail and pawl carried thereby, the stationary pawls, the rocking lever having one arm designed to sup- port the swinging portion of the bail, a second  
20 registering-wheel adapted at each revolution to rock said lever and cause the bail to fall, and one of said stationary pawls to be re- leased from engagement with one of said ratchet-rings, and means for raising said bail,  
25 combined as set forth.

14. In a registering mechanism for cash- registers, the combination of the registering- wheel and shaft carrying same, ratchet-rings secured thereto, or forming a part thereof,  
35 the bail and pawl designed to engage with the teeth of one of said rings, the stationary pawls reversely arranged, and engaging with the teeth of said ratchet-rings, the rocking lever having one arm designed to support the swing- ing  
40 portion of the bail, a second registering- wheel and lug carried thereby, which latter is adapted to strike an arm of said lever, at each revolution of the wheel carrying the lug, whereby the lever is rocked and one of the  
45 stationary pawls released, and means for rais- ing the bail and for operating the registering- shaft, as set forth.

15. In combination in a registering mech- anism, the registering-wheel and ratchet-rings  
50 secured thereto, the shaft on which the latter are mounted, and means for rotating same, the stationary pawls engaging with the re- versely-arranged teeth on said ratchet-rings, the bail, the pawl carried thereby, the rock- ing lever designed to support the bail, one of  
55 said stationary pawls having a lug which en- gages in an aperture in said lever, and means for rocking the latter, as set forth.

16. In a registering mechanism for cash- registers, the combination with the register- ing-shaft, the wheel, ratchet-rings provided with reversely-arranged teeth secured to said wheel, of the stationary pawls mounted on a common pivot, and having a spring connect- ing corresponding ends of said pawls, and

means for automatically releasing one of the pawls to allow a partial revolution to be im- parted to the registering-wheel, as set forth.

17. In a registering mechanism for cash- registers, the combination with the register- ing shaft and wheel and ratchet-rings mount- ed thereon, of the stationary pawls designed  
70 to engage with the reversely-arranged teeth of said ratchet-rings, the swinging bail and pawl carried thereby, the pivoted rocking lever adapted to support the swinging end of  
75 the bail, and a sliding pivotal connection be- tween one of said pawls and the lever, where- by, as said lever is tilted, said pawl, pivoted to the latter will be held out of the path of  
80 the teeth of the ratchet-ring until the bail is returned to its starting position and supported on said lever, and means for actuating the lever and bail, as shown and described.

18. In combination with the main rotary  
85 and reciprocating shaft, a registering-shaft and registering-wheels mounted thereon, pawls for normally locking one of the regis- tering-wheels from rotation in either direc- tion, one of said pawls adapted to be auto- matically released to allow the wheel to rotate  
90 during the registering operation, means for limiting the rotary movement of the latter and mechanism operated by the reciprocating shaft for actuating the registering-wheels,  
95 as set forth.

19. In combination with the main rotary and reciprocating operating-shaft of a cash- register, a registering-shaft and registering- wheel mounted thereon, means for operating  
100 said wheel, reversely-arranged pawls for nor- mally locking said registering-wheel from ro- tation in either direction, a disk designed as it is rotated to disengage one of said pawls to allow the registering-wheel to rotate, and  
105 means for limiting the rotary movement of said wheel, as set forth.

20. In combination with the main rotary and reciprocating operating-shaft of a cash- register, the registering-shaft and registering- wheel mounted thereon, means for operating  
110 the latter and ratchet-rings with reversely- arranged teeth thereon, designed to rotate with said wheel, and pawls engaging with the teeth of the ratchet-rings, and means for re- leasing one of said pawls to allow the regis- tering-wheel to rotate during the registering operation, and for limiting the rotary move- ment of said wheel.  
115

21. In combination with the main rotary  
120 and reciprocating shaft, a registering-wheel and shaft carrying the same, means for oper- ating said shaft, and ratchet-rings having re- versely-arranged teeth rotating therewith, pawls normally engaging with the teeth of  
125 said ratchet-rings, a rotary notched disk de- signed to throw one of said pawls out of en- gagement with one of said ratchet-rings to al- low a registration to be effected, said released pawl adapted to engage in the notch of the  
130

disk after the registration is made, and lock the registering-wheel against further rotation, as set forth.

22. A check-printing attachment for cash-registers, comprising the extensible operating-shaft of the register, the type-wheel keyed to rotate therewith, the check and detail strips fed adjacent to said type-wheel, inking-ribbons interposed between said strips and a hammer for striking the strips and inking-ribbons against the type-wheel, and means for operating the hammer, as set forth.

23. In a check-printing attachment for cash-registers, the combination with the extensible shaft of a register, a type-wheel mounted to rotate with said shaft, a pivoted platen and longitudinally-movable bar in contact with one end of said platen, and a wheel carried by said shaft, which is designed to strike against the end of the bar to cause the platen to strike against the type-wheel, as set forth.

24. In a check-printing attachment for cash-registers, the combination with the extensible shaft of a register, a type-wheel mounted to rotate with said shaft, the pivoted platen and a longitudinally-movable bar having a shouldered end designed to contact with the pivoted end of the platen, a wheel keyed to said shaft, adapted to strike against an upturned portion of said bar as the shaft is extended, whereby the platen may be thrown forcibly against the type on the type-wheel, as set forth.

25. In a check-printing attachment for cash-registers, the combination with the shaft, the type-wheel, the platen and means for operating the same, the reel of check-strip paper mounted on a spindle, and loosely held in brackets, a friction-roller against which said reel normally contacts, and a diagonally-disposed roller designed to turn at right angles to said strip and feeding mechanism for advancing the said strip between the platen and the type on the said type-wheel, as set forth.

26. In a check-printing attachment for cash-registers, the combination with the extensible shaft and type-wheel keyed to rotate therewith, the platen and means for operating same as the shaft is extended, the check and detail strips passed over suitable rollers and between said platen and type-wheel, the ribbon between said detail and check strips, a roller having a flattened portion designed to impart an intermittent movement to said check-strip, a knife actuated by said flattened roller for severing the check-strip, as set forth.

27. In a check-printing attachment for cash-registers, the combination with the extensible shaft, the type-wheel splined to rotate therewith, the pivoted platen and means for throwing the latter against the type-wheel as said shaft is extended, the check and detail strips, the friction-roller having a por-

tion of its circumference flattened, a second friction-wheel held in contact with said flattened wheel during a partial revolution of the latter, shearing-knives between which the check-strip is fed, and means for shearing off the check-strip as the flattened portion on said friction-wheel passes adjacent to said second friction-roller, as set forth.

28. In a feeding mechanism for check-printing devices, the combination with the check and transparent detail strip and inking-ribbon mounted on rollers as described, a shaft and feeding-roller turning therewith for advancing the check-strip, a gear-wheel turning with said shaft, a single tooth on a shoulder of said gear-wheel, a feeding-roller for the detail-strip, a gear-wheel rotating with said detail-strip-feeding roller, and designed to be engaged by said single tooth at each revolution of the wheel carrying the latter, shearing-knives, one of which is actuated by said check-feeding roller at each revolution of the latter, as set forth.

29. In a feeding mechanism for check-printing devices the combination of the check and transparent detail strips, and the inking-ribbon mounted on rollers as described, a shaft and feeding-roller mounted thereon, for advancing the check-strip, a gear-wheel turning with said shaft, a single tooth on a shoulder of said gear-wheel, a feeding-roller for the detail-strip, a gear-wheel rotating therewith designed to be engaged by said single tooth at each revolution of the wheel carrying the latter, and a friction-wheel held yieldingly against the detail-feeding roller, as shown and described.

30. In a feeding mechanism for check-printing devices, the feed-roller over which a detail-strip is designed to be passed, the spring-actuated friction-roller held yieldingly against said feed-roller, and a pivoted lever having an end resting underneath said friction-roller, whereby the latter may be raised and held from contact with the feed-roller, combined as set forth.

31. In a feeding mechanism for check-printing devices, the feed-roller over which a detail-strip is designed to be passed, the spring-actuated friction-roller held yieldingly against said feed-roller, combined with a bent lever having ears pivoted to the framework, integral arms on said lever resting under the feed-roller, whereby the latter may be raised and held out of contact with the feed-roller, as set forth.

32. In a cash-register, the combination with the rack-bars N and N', lugs at each of the ends of said rack-bars on their upper faces and the operating-shaft, the stepped shells mounted thereon designed to drive forward and return to their starting positions said rack-bars, and the registering mechanism actuated by said rack-bars, as shown and described.

33. In a cash-register, the combination with the operating-shaft, the stepped shells of different diameters mounted thereon, the rack-bars having each a lug at each end, said lug  
5 at corresponding ends of said rack-bars being of different heights and the registering mechanism actuated by said rack-bars as the operating-shaft is drawn forward and returned to its starting position, as shown and described. 10

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

DANIEL W. HARPER.

Witnesses:

AUGUSTA RAUM,

ELISBETH RAUM-HARPER.