

**No. 679,073.**

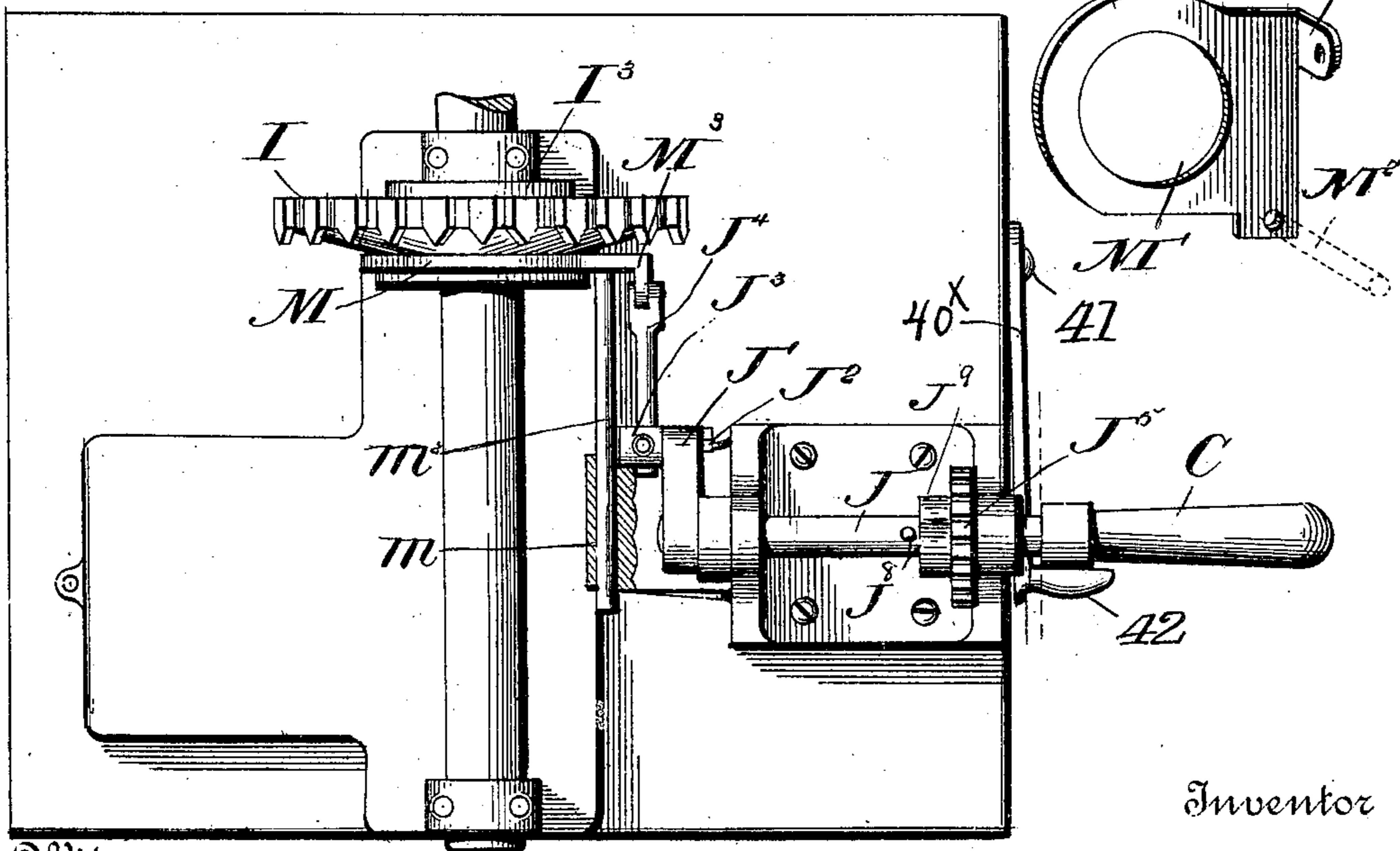
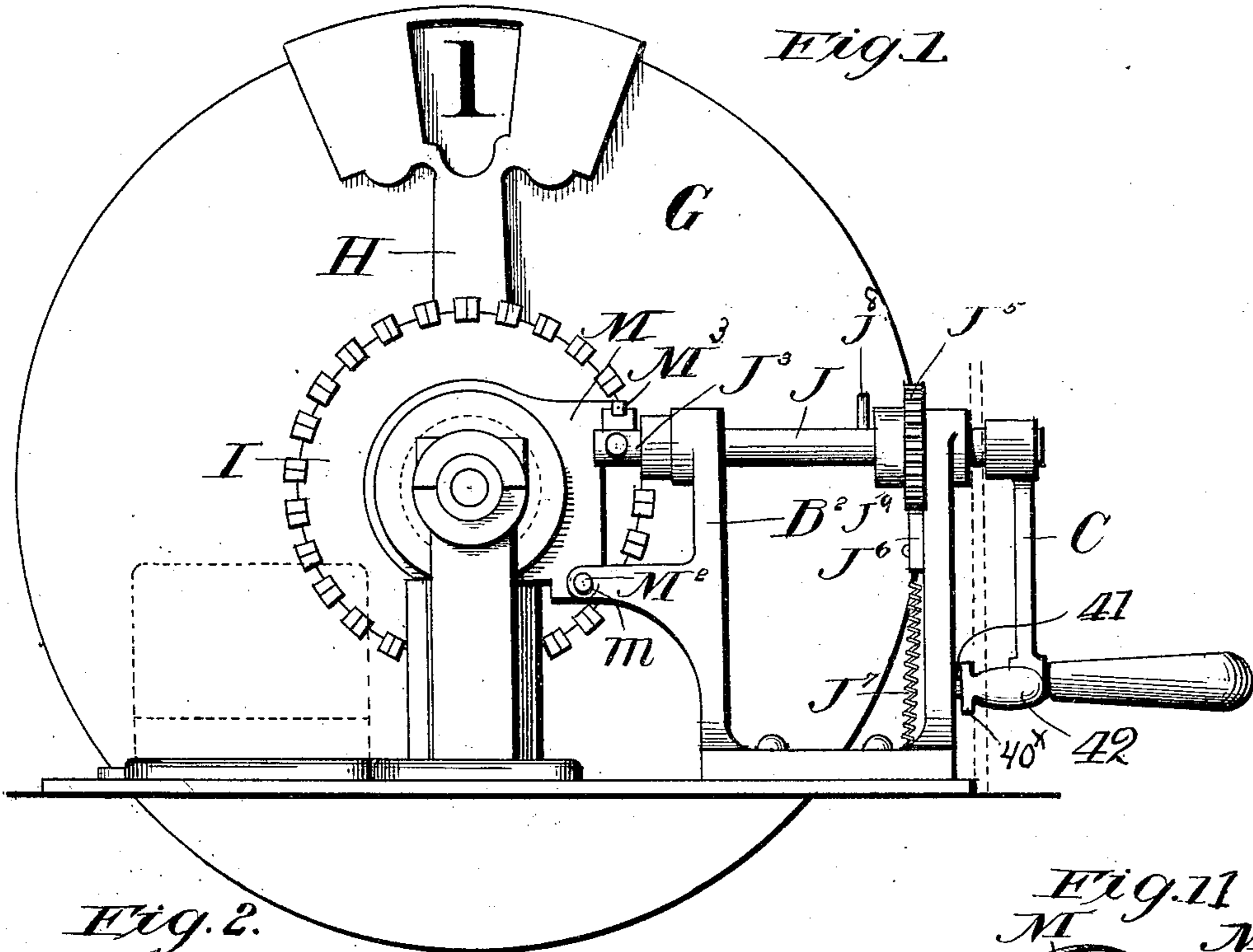
**Patented July 23, 1901.**

**D. W. HARPER.**  
**CASH REGISTER.**

(Application filed Apr. 6, 1900.)

(No Model.)

**6 Sheets—Sheet 1.**



Witnesses

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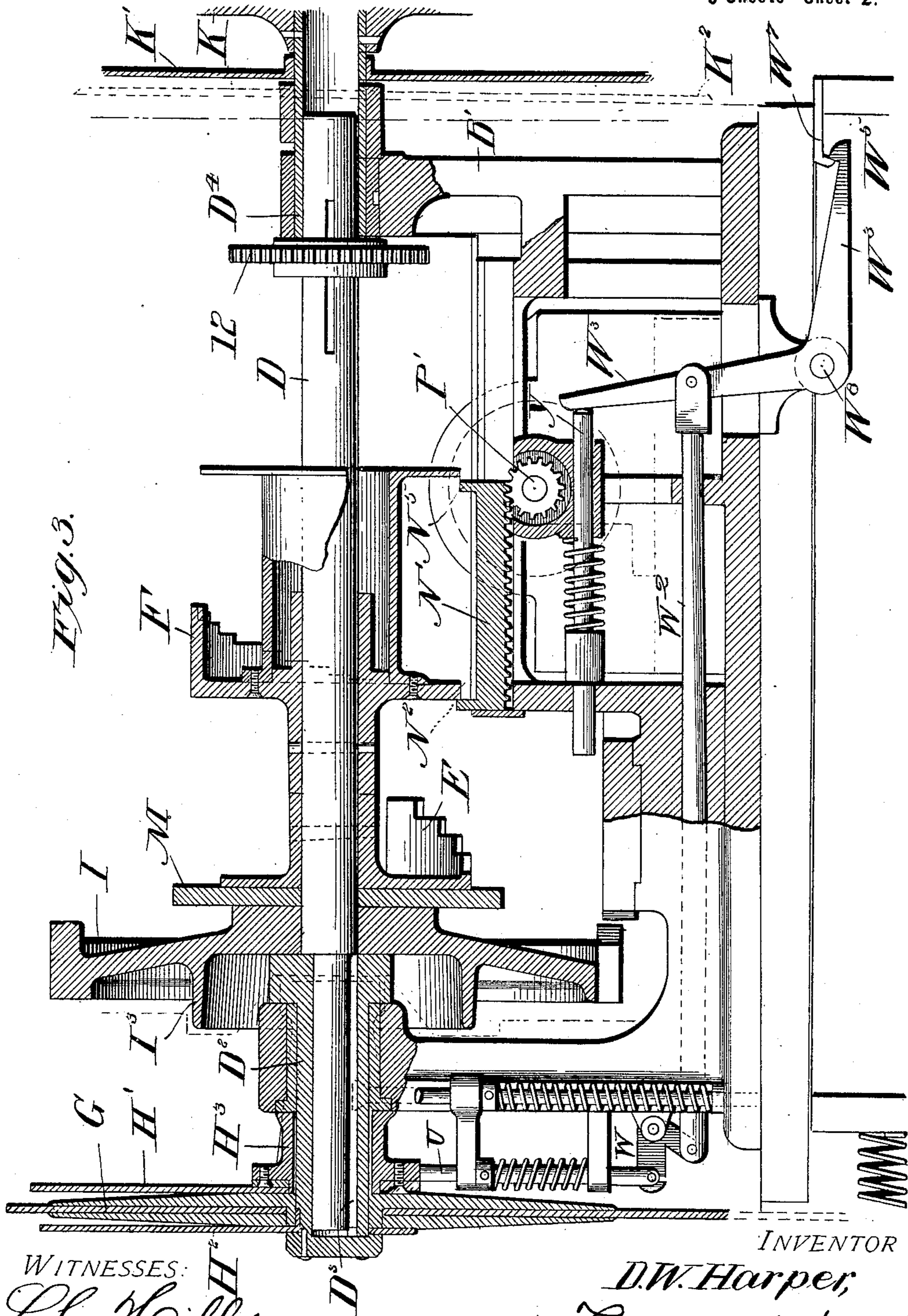


Fig. 3.

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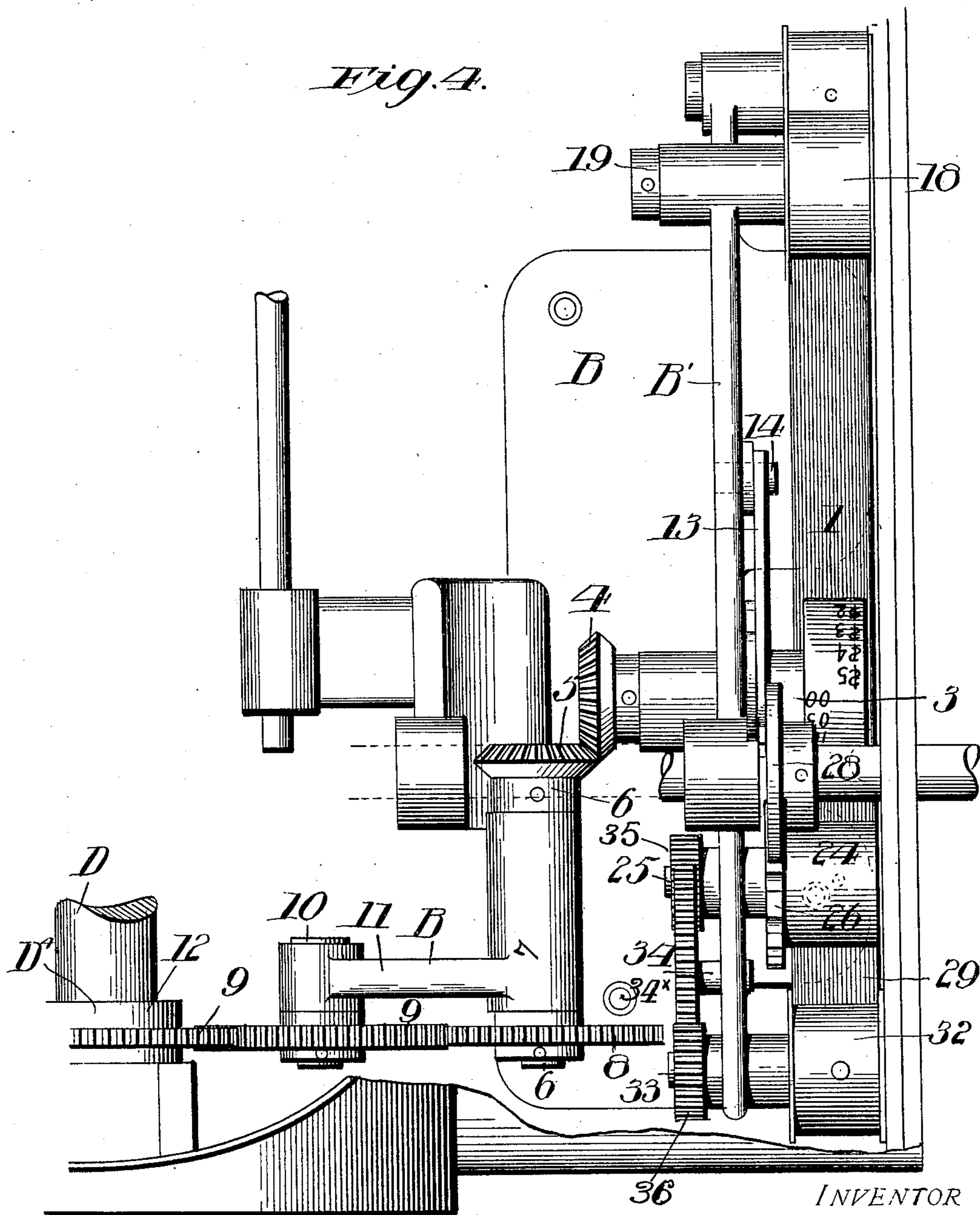
D. W. HARPER.  
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(Application filed Apr. 6, 1900.)

(No Model.)

6 Sheets—Sheet 3.

*Fig. 4.*



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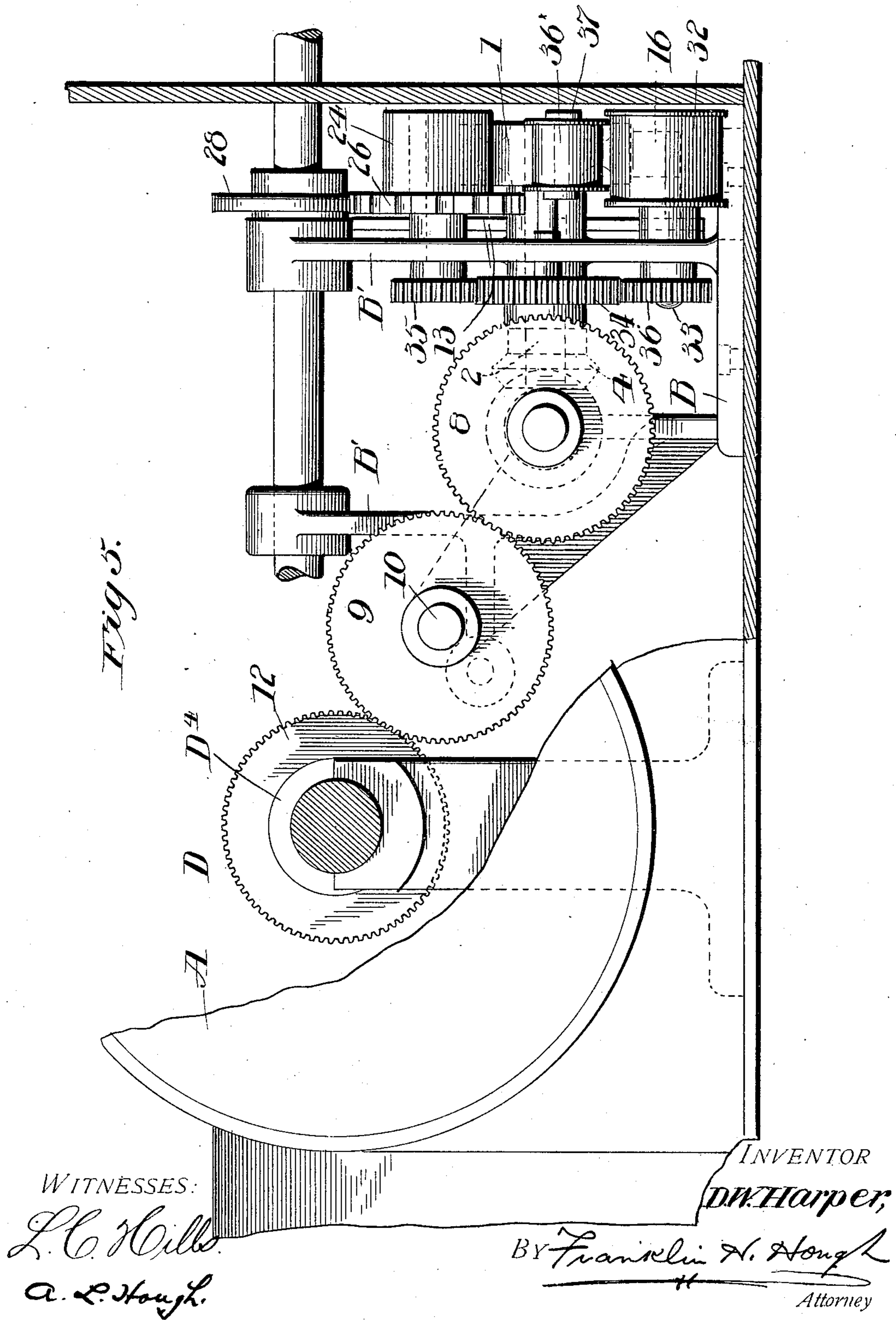
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**6 Sheets—Sheet 4.**



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(Application filed Apr. 6, 1900.)

(No Model.)

6 Sheets—Sheet 5.

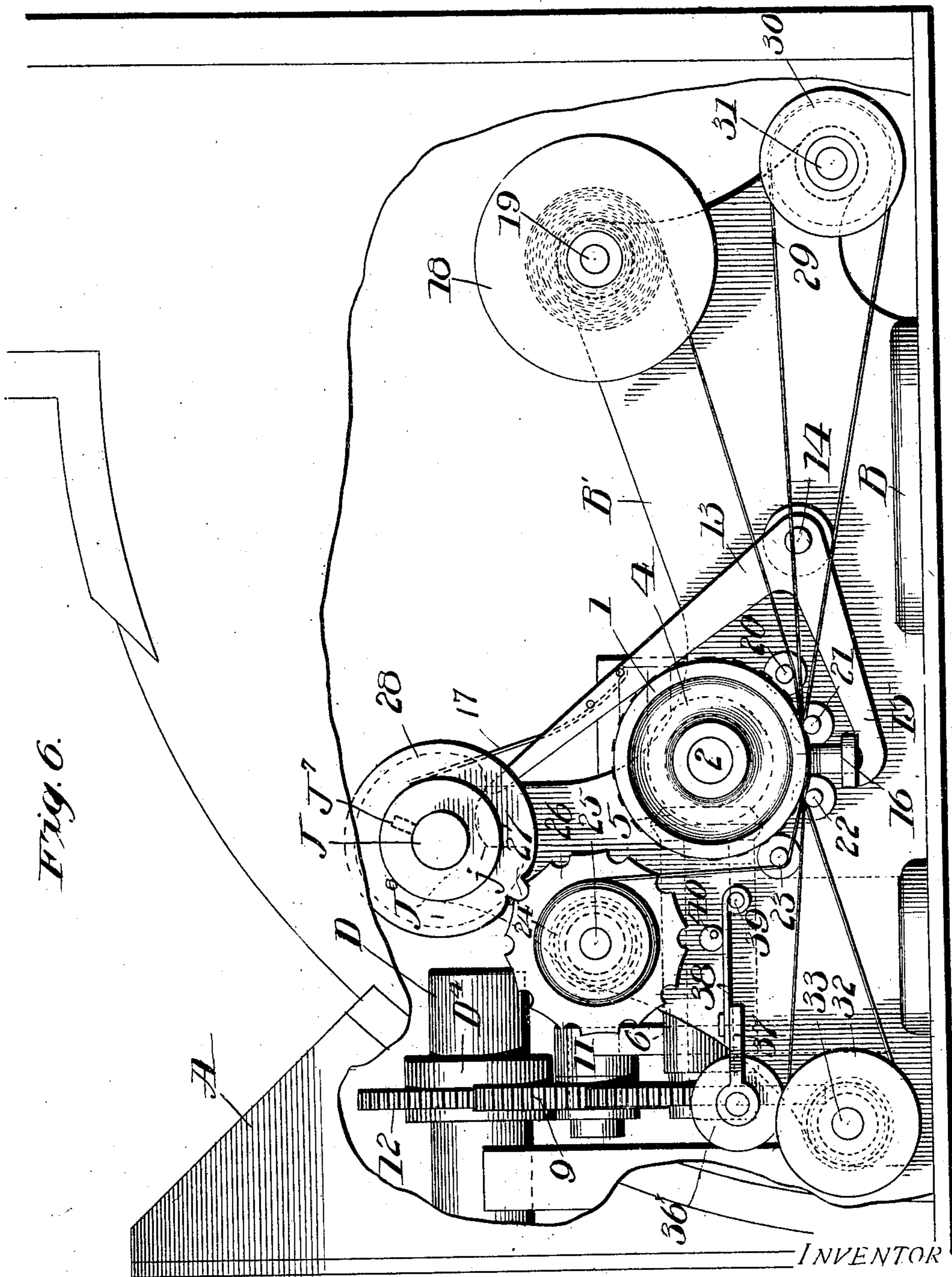


Fig. 6.

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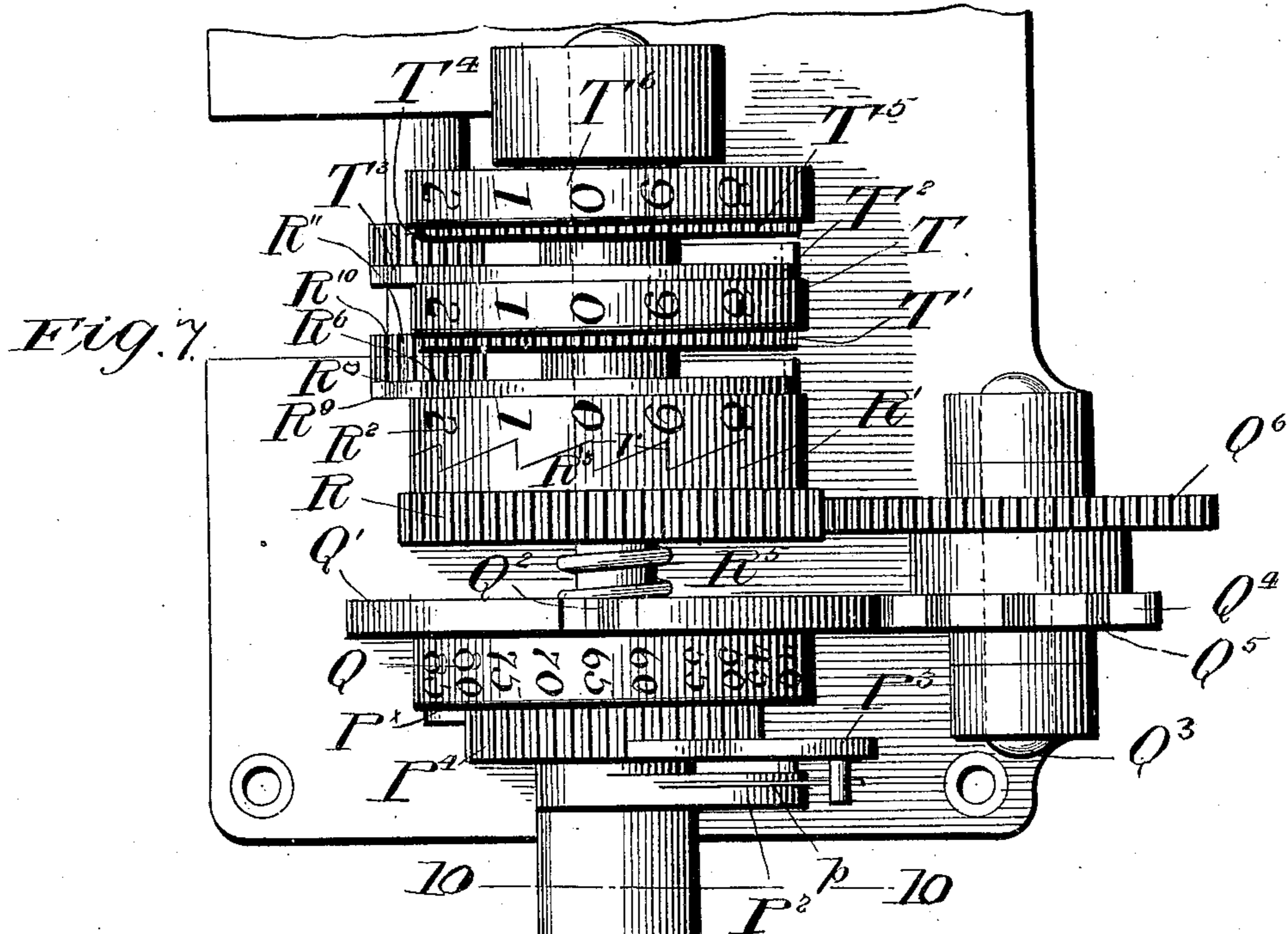
Patented July 23, 1901.

D. W. HARPER.  
CASH REGISTER.

(Application filed Apr. 6, 1900.)

(No Model.)

6 Sheets—Sheet 6.



# UNITED STATES PATENT OFFICE.

DANIEL W. HARPER, OF MEMPHIS, TENNESSEE, ASSIGNOR TO THE TOLEDO CASH REGISTER COMPANY, OF TOLEDO, OHIO.

## CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 679,073, dated July 23, 1901.

Application filed April 6, 1900. Serial No. 11,867. (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 ap-  
10 pertains 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.

15 This invention relates to improvements in cash-registers, and especially to registers of a rotary type; and in carrying out the present invention it is my object to generally improve upon and simplify the cash-registers embodied in my pending applications, Serial Nos. 20 657,268 and 706,828, respectively.

In the present application one of the essential objects attained is a novel means of converting a rotary into a reciprocating motion, 25 whereby a registration of various purchase amounts may be effected without the necessity of a direct pull of the reciprocating operating-shaft as employed in the constructions embodied in my previous applications for Let- 30 ters Patent above noted. To accomplish this result, I provide a suitable crank-shaft having crank-and-pitman connections with a swivel or loosely-mounted plate carried upon the reciprocating operating-shaft, so arranged 35 that at each revolution of the crank-shaft the reciprocating operating-shaft is thrown to its farthest outward limit and returned to its starting position, thereby causing the registration of any purchase amount. Another 40 feature of this part of the invention is the provision of means whereby I provide a full throw or stroke to the reciprocating shaft, making it impossible to effect a reverse rotary movement to the crank-shaft or to allow the 45 reciprocating shaft to make a partial longitudinal movement and return to its normal or starting position.

Another object of the present invention resides in improvements in the registering 50 mechanism or total-adder whereby at each revolution of the cent registering-wheel a par-

tial revolution is imparted to the first dollar registering-wheel, the transferring of the amount to be registered being effected through the medium of an intermittent gear, 55 which in turn actuates intermeshing gear-wheels, which cause the dollar registering-wheel to rotate.

Another part of the invention resides in the detail-strip-printing attachment whereby 60 each amount that is registered is printed upon a strip of paper and wound upon a suitable reel at each revolution of the crank operating-shaft, which actuates the extensible operating-shaft. 65

Another feature of the improved registering mechanism consists in the provision of means whereby the dollar registering-wheels may be operated independent of the cent registering mechanism, the detailed construction 70 of which will hereinafter appear and be clearly illustrated in the accompanying drawings.

The invention will be clearly understood when taken in connection with the drawings forming part of this application, in which 75 drawings similar characters of reference indicate like parts throughout the several views, in which—

Figure 1 is an end elevation of the reciprocating shaft and wheels carried thereby, showing the crank and shaft at right angles to the reciprocating shaft. Fig. 2 is a top plan view of the mechanism for operating the reciprocating shaft. Fig. 3 is a central vertical and longitudinal sectional view through the reciprocating operating-shaft and frame, parts of the mechanism being shown in elevation. Fig. 4 is a top plan view of the detail-printing attachment. Fig. 5 is a front view of the register, showing the printing mechanism in elevation. Fig. 6 is a side elevation of the detail-printing mechanism, the casing of the register being shown as broken away to better illustrate the mechanism within. Fig. 7 is a top plan view of the registering mechanism 85 forming part of the present invention. Fig. 8 is a detail view of one of the ratchet-wheels, which has lateral and internal teeth and is utilized for actuating the dollar registering mechanism. Fig. 9 is a detail view of the intermittent gear-wheel, which is carried on a counter-shaft and utilized in transferring mo- 90 100

tion to the dollar registering mechanism; and Fig. 10 is a sectional view taken on line 10 10 of Fig. 7. Fig. 11 is a detail view of a swivel-plate carried by the operating-shaft.

5 Reference now being had to the details of the drawings by letter, A designates the casing of the register, which is shown generally as broken away to better illustrate the operative mechanism within, and mounted in said  
10 casing is a frame B, which supports the operative parts of the register. In an upright portion B' of the frame is rotatably held a sleeve D<sup>1</sup>, in which one end of the operating-shaft is splined. Keyed or otherwise fastened  
15 to the outer end of said sleeve is a handle K, and fastened to rotate with said sleeve is a double-ended indicating-pointer K', and directly behind said indicating-pointer is a dial K<sup>2</sup>, both pointer and dial being substantially  
20 similar to those shown and described in my former applications herein referred to. The opposite end of the operating-shaft D is mounted in a sleeve D<sup>2</sup>, which is rotatably held in an upright portion of the frame, there  
25 being a spline D<sup>3</sup>, carried by the end of the shaft D, which works in a longitudinal recess in the bore of the sleeve D<sup>2</sup>, whereby the shaft may have a longitudinal movement independent of said sleeve D<sup>2</sup>, but the latter adapted  
30 to rotate with the shaft by means of the spline connection between the two. Mounted about and rotating with the sleeve D<sup>2</sup> is the indicating-dial G. Loosely journaled about the sleeve D<sup>2</sup> is a second sleeve H<sup>3</sup>, which latter  
35 carries a shutter having arms H' and H<sup>2</sup>, the former of which arms is secured about and caused to rotate with the sleeve H<sup>3</sup>, while the second arm H<sup>2</sup>, on the opposite side of the indicating-dial from the arm H', has an apertured end which is loosely journaled about  
40 the circumference of the sleeve D<sup>2</sup>. These features of the sleeves and shutters form no part of the present invention, but are covered in my former applications referred to.

45 To the reciprocating operating-shaft D is keyed the guide-wheel I, having a series of recesses about its circumference, and a frictional flange I<sup>3</sup> on the rear face of said wheel is designed to engage with the frictional arms  
50 of the screen or shutter for the purpose of actuating the latter as said guide-wheel is rotated, but which features, being covered in my former applications, form no part of the present invention. The dollar step-wheel E,  
55 which is fastened to and rotates with the shaft D, and the cent-wheel F, also rotating with the shaft D, are identical with the step members shown and described in my former applications. Interposed between the guide-  
60 wheel I and the dollar step member E and loosely mounted about said shaft is a plate M with circular aperture M' therein, and secured to said plate and extending at right angles therefrom is a guide-rod M<sup>2</sup>, which is  
65 adapted to slide in a guide-aperture m in the framework of the register. Mounted in suitable bearings at the upper ends of the up-

rights B<sup>2</sup> is the crank-shaft J, and to one end of said shaft is keyed the operating-handle C, and to the opposite end of said shaft J is  
70 keyed or otherwise fastened a crank J', to the end of which a pin J<sup>2</sup> is journaled in an aperture in said crank. Said pin is carried by a block J<sup>3</sup>, to which is fastened a pitman J<sup>4</sup>, having a forked end which is pivoted to the  
75 angled extension M<sup>3</sup> of the plate M. By this construction it will be noted that at each revolution of the crank-shaft J, which is actuated by the crank C, the extensible shaft  
80 will, through the connections described, be caused to be thrown to its farthest outward limit and returned to its starting position, whereby a registration is effected and a detail-strip printed by mechanism which will  
85 be hereinafter described.

Keyed or otherwise mounted upon the shaft J is a ratchet-wheel J<sup>5</sup>, the teeth of which are engaged by the pivoted pawl J<sup>6</sup>, which is mounted on one of the upright portions of the frame of the register, and by means of  
90 the spring J<sup>7</sup>, secured at its upper end to the pivoted end of said pawl and its lower end fastened to the frame of the register, the free end of the pawl is normally held in engagement with the teeth of said ratchet J<sup>5</sup>, thus  
95 allowing the shaft J to rotate only in one direction, which will insure a full throw to the main operating-shaft before a registration can be effected. Secured to the shaft J is a cam J<sup>9</sup>, on the circumference of which the end of  
100 the angle-lever 13 rides and holds the platen 16 out of contact with the type-wheel 1, excepting at each revolution the moment the offset j in the cam comes opposite the upper end of said lever 13, when the force of the  
105 spring 17 will throw the upper end of the lever into said offset and the platen, ink-ribbon, and tape against the type-wheel, and almost immediately the platen will be thrown away from the type-wheel by the upper end of the  
110 lever being forced down by the curved wall of said offset as the cam continues to rotate in making a complete revolution.

A lug or pin J<sup>8</sup>, carried by and rotating with the shaft, is provided to strike against  
115 the hammer of a bell, (not shown,) so that at each revolution of the shaft whereby the mechanism is actuated to release the catch of the money-drawer or the machine is actuated the bell is rung to indicate that the  
120 machine is being operated.

The detail-strip-printing mechanism will next be taken up and described in detail, and comprises a type-wheel 1, which is mounted to rotate with the shaft 2, which is journaled  
125 in bearings 3 (shown in Fig. 4) of the frame, and secured to said shaft 2 in any suitable manner and adapted to rotate with the said shaft is a beveled gear 4, which meshes with the teeth of the beveled gear 5, which latter  
130 gear-wheel is keyed to and rotates with a shaft 6, mounted in the bearings 7. Keyed or otherwise fastened to the outer end of the shaft 6 is a gear-wheel 8, which meshes with

the teeth of the gear-wheel 9, mounted on a stub-shaft 10, which latter is journaled in an aperture in an arm 11 of the framework of the machine. Said gear-wheel 9 in turn meshes with a gear-wheel 12, which is mounted on and rotates with the sleeve  $D^4$ , which is splined to the shaft D. By this geared connection between the main operating-shaft D and the type-wheel it will be noted that as the main operating-shaft and dial actuated thereby are rotated in one direction or the other a corresponding motion will be communicated to the type-wheel through the intermeshing gear described, thus causing a numeral on the type-wheel (which numeral corresponds to the numeral indicated on the dial) to come into position to print the numeral upon a detail-strip by means of a hammer or platen, which is actuated each time the crank-shaft J makes a complete revolution. The hammer or platen before referred to consists of the angle-lever 13, which is pivoted at 14 to the frame of the machine, and one arm extends up and adapted to ride on the circumference of the cam  $J^9$  before described and as clearly shown in Fig. 6 of the drawings. The other arm of said lever is bent at 15 at right angles and at its end has a flanged head 16, which normally rests directly underneath the type-wheel and in readiness to be thrown up against the type-wheel after the opposite end of the lever is thrown by the spring 17 into said offset of the cam. The spring 17 has its lower end secured to the frame of the register and bears against the upper edge of the arm of the lever and is provided to forcibly throw the hammer against the raised type on the circumference of the type-wheel as the upper end of the lever 13 enters said offset  $j$ , thus causing an impression to be made upon the detail-strip, which is fed between the face of the hammer and the type-wheel. This detail-strip has one end secured to and wound about the wheel 18, which is loosely journaled on a stub-shaft 19 on the frame of the machine, and said detail-strip after passing underneath the roller 20 and over the rollers 21 and 22 passes underneath the roller 23 and thence upward and about the reel 24, which is mounted on a stub-shaft 25, carried by the frame of the machine. The reel 24 has secured thereto an intermittent wheel 26, (illustrated in the detail view shown in the drawings,) said intermittent wheel having a series of notches which are singly engaged by the tooth 27, mounted on the circumference of the wheel 28, which wheel is keyed to or fastened to rotate with the shaft J. By this mechanism it will be noted that at each revolution of the wheel 28 a partial revolution will be imparted to the wheel 26 sufficient to cause a slight advancement of the detail-strip from the reel 18 to the reel 24. The endless inking-ribbon 29 passes about the reels 30 and 32, carried, respectively, by the stub-shafts 31 and 33, and passes over the rollers 21 and 22 and underneath the detail-strip. In order

to impart movement to the inking-ribbon, a gear-wheel 34, journaled on a stub-shaft  $34^x$ , Fig. 4, is provided, which is in mesh with the gear-wheels 35 and 36, which are mounted, respectively, on and rotate with the stub-shafts 25 and 33. In order to hold the inking-ribbon from a backward movement and causing said ribbon to turn with the reel 32, a contact-wheel  $36^x$  is provided which is mounted on a yoke 37, which yoke is fastened to and supported by the flat spring 38, which is mounted upon a pin 39. The detail construction of this contact-roller and its connections is clearly illustrated in detail view Fig. 8 of the drawings. This pin 39 is mounted on a portion of the frame of the machine, and in order to hold the spring and the contact-wheel fastened thereto against the inking-ribbon, which winds about the reel 32, a cam-pin 40 bears against the upper surface of the spring, as shown in Fig. 6 of the drawings.

A suitable stop-lever  $40^x$ , Figs. 1 and 2, is pivoted at 41 to the frame of the register, and its free angled end 42 normally rests in the path of the handle on the crank C. This stop is held in its normal position by means of a spring, (not shown,) and when it is desired to rotate the shaft J the thumb of the hand of the operator grasping the crank-handle may easily depress said stop-lever out of the way of the crank-handle, allowing the latter to rotate. After the thumb is released from said stop it returns to its normal position and serves to limit further rotary movement of the crank after a complete revolution of the latter has been made.

The registering mechanism forming part of the present invention consists of the shaft  $P'$ , which is journaled in suitable bearings at right angles to the longitudinal shaft, and said shaft has loosely mounted thereon a sleeve P, having a series of cog-teeth forming an integral wheel  $P^6$  at one end, which teeth are adapted to be engaged by the teeth of the rack-bar  $N'$  as the rack-bar is driven forward by means of one of the steps of the cylinder F striking against a lug  $N^5$ , projecting above the upper surface of the said rack-bar. Said sleeve P is loosely journaled upon the shaft  $P'$  and has an integral arm  $P^2$ , carrying a pivotal pawl  $P^3$ , the free or hooked end of which pawl is normally held in engagement with the teeth of the ratchet-wheel  $P^4$ , which is loosely mounted on the shaft  $P'$  independent of the sleeve. Said pawl  $P^3$  is held in engagement with the teeth of the ratchet-wheel  $P^4$  by means of a spring  $p$ , and as the extensible operating-shaft, which has been set to indicate and register an amount less than a dollar, is drawn out the sleeve is caused to rotate toward the front of the register, and the pawl  $P^3$  will turn idly on the ratchet-wheel  $P^4$ , said ratchet-wheel being prevented from rotating forward or in a similar direction with the sleeve P as the shaft is drawn out by means of a stationary pawl  $P^x$ , which allows said ratchet-wheel  $P^4$  to rotate only in one direction, and

that in the direction in which a registration is made on the return stroke of the extensible operating-shaft. Integral with or secured to said ratchet-wheel P<sup>4</sup> is the cent registering-wheel Q, which has about its circumference a series of numerals indicating purchases less than a dollar, and integral with or secured to the said wheel Q is a wheel Q', having a single notch Q<sup>2</sup> on its circumference. Mounted on a counter-shaft Q<sup>3</sup>, which turns in suitable bearings in the frame of the registering mechanism, is an intermittent wheel Q<sup>4</sup>, having a series of notches Q<sup>5</sup> spaced apart, as clearly illustrated in the drawings, and the circumference of said single-toothed wheel Q' is adapted to contact with the circumference of said notched wheel Q<sup>4</sup>, and at each revolution of the wheel Q' as its single tooth engages one of the notches in wheel Q<sup>4</sup> a partial revolution is imparted to the latter. This wheel Q<sup>4</sup>, which is keyed to the shaft Q<sup>3</sup>, rotates said shaft Q<sup>3</sup>, and with the same a geared wheel Q<sup>6</sup>, which is also mounted to rotate with the shaft Q<sup>3</sup>. Mounted loosely on the shaft P' is a gear-wheel R, and secured to or integral with the latter is a toothed disk R', having teeth r upon its face. Loosely mounted upon the shaft P' is a dollar registering-wheel R<sup>2</sup>, which latter has a series of teeth R<sup>3</sup>, adapted to normally intermesh with the teeth r on the disk R', whereby the two wheels R and R<sup>2</sup> are caused to rotate together when the shaft is effecting a registration; but when the dollar step member E is turned so that one of its steps will strike a lug N<sup>2</sup> on a rack-bar (not shown) said rack-bar will cause the shaft P' to rotate in a direction toward the front of the register by means of said rack-bar having a lug N<sup>2</sup>, which rack-bar meshes with the teeth of the pinion P<sup>7</sup>, which latter is keyed to the shaft P'. As the shaft P' is rotated forward by the dollar step member the dollar registering-wheel R<sup>2</sup>, which is loosely mounted on said shaft P', remains idle, while the pawl S', pivoted to the disk S, keyed to the shaft P', turns idly over the internal teeth of the wheel R<sup>2</sup>. On the return movement of the reciprocating shaft the shaft P' rotates in a reverse direction, and the pawl S', engaging a ratchet-tooth on the inner periphery of the wheel R<sup>2</sup>, will cause the latter to rotate with the shaft P'. As the wheel R<sup>2</sup> begins to rotate, the toothed disk R' and gear-wheel R will be forced away from the dollar registering-wheel R<sup>2</sup>, the spring R<sup>5</sup> yielding under the pressure. When the shaft returns to its starting or normal position, the tension of the spring R<sup>5</sup> will cause the toothed disk R' to engage the teeth of said wheel R<sup>2</sup>. Integral with or secured to rotate with the wheel R<sup>2</sup> is a disk R<sup>6</sup>, having a single notch in its circumference, which notch is engaged by a tooth R<sup>8</sup> of the star-wheel R<sup>9</sup>, which latter is integral with a pinion-wheel R<sup>10</sup>, loosely mounted on a stub-shaft R<sup>11</sup>. The second dollar registering-wheel T is loosely mounted on the shaft P', and fastened to or integral with said wheel T

is a gear-wheel T', the teeth of which are designed to mesh with the teeth of the pinion-wheel R<sup>10</sup>, whereby as the dollar registering-wheel R<sup>2</sup> makes a complete revolution, and with it the disk R<sup>6</sup>, the single notch in the circumference of the latter will be engaged by a tooth R<sup>8</sup> of the star-wheel and impart a partial revolution to the second dollar registering-wheel T. To the outer face of the registering-wheel T is fastened a disk T<sup>2</sup>, having a single notch in its circumference, which notch at each revolution of the disk T<sup>2</sup> engages a tooth of a wheel T<sup>3</sup>, similar to wheel R<sup>9</sup>, before described. A pinion T<sup>4</sup>, integral with the wheel T<sup>3</sup>, in turn meshes with a gear-wheel T<sup>5</sup>, which rotates a third dollar registering-wheel T<sup>6</sup> in a similar manner as the other dollar registering-wheels are operated.

The means for releasing the money-drawer and allowing the same to open when the extensible shaft is drawn forward, consisting of the angle-lever W<sup>3</sup>, pivoted at W<sup>8</sup> to a portion of the frame of the register, and having an arm W<sup>5</sup> engaging a catch W<sup>7</sup> on the money-drawer, and the longitudinally-movable rod Y, which strikes against the upwardly-extending arm of said angle-lever W<sup>3</sup> when the wheel I is drawn forward to its outermost limit and releases said lever from the catch, are similar to the constructions shown in my former applications hereinbefore alluded to, also the means for releasing the shutter to allow it to return to its normal position after being tilted, comprising the spring-actuated bolt U, engaging with a shutter-arm and connected to the angle-lever W, which latter is in turn pivoted to the rod W<sup>2</sup>, actuated by the angle-lever W<sup>3</sup>, are substantially like the constructions in my former applications. Hence it is not thought necessary to give further detail description of these parts.

In operation when it is desired to register a purchase amounting to less than one dollar the operator rotates the shaft D by means of the handle K, so that the indicating-pointer K' will indicate upon the dial the amount to be registered. As the shaft D is rotated in one direction or the other, so as to bring said indicating-pointer opposite the amount to be registered, the particular step member on the shell F corresponding to the purchase amount to be registered will assume a position directly underneath the operating-shaft and in the path of the lug N<sup>5</sup> on the rack-bar N'. When the register is being operated to register amounts less than one dollar, the blank portion of the circumference of the shell E is presented over the lugs on the rack-bar N', only one of which, N', (shown in the drawings in Fig. 3,) passes over the same without contact with said lugs. These rack-bars mesh, respectively, with the pinions P<sup>6</sup> and P<sup>7</sup>, (shown in Fig. 7,) as in my former applications herein referred to. The amount of the purchase being thus indicated by the rotation of the shaft D and the shutter being thrown

over the sight-aperture of the rotary dial, the operator makes a complete revolution of the shaft J by means of the crank C. The crank C is allowed to turn only in a forward direction by means of the pawl J<sup>6</sup> engaging the teeth of the gear-wheel rotating with the shaft J, thus making it necessary to complete the revolution of the shaft J to produce a full throw and return stroke to the extensible shaft in order to cause a registration and printing of the purchase amount. As the operator makes a complete revolution of the crank C, the shaft D, by means of the crank-and-pitman connections with the plate M, carried on the shaft D, will cause said shaft to be thrown forward to its outermost limit and returned to its starting position. As the operating-shaft D is rotated in one direction or the other for the purpose of bringing the indicating-pointer turning with said shaft opposite the numeral on the dial corresponding to the amount to be registered, the type-wheel 1, through its connections, by means of the geared wheels intermeshing with one another and with a gear-wheel turning with the shaft D<sup>2</sup>, will rotate, so that the type-numerals corresponding to the amount to be registered will come in a position directly underneath the lowest part of the type-wheel. As the shaft J is rotated sufficiently to bring the offset portion of the cam J<sup>7</sup> opposite the upper end of the lever 13, the spring bearing against said lever will throw it upward and the platen will strike against the type-wheel. After the offset portion of said cam passes the upper end of the lever the platen will be thrown away from the type-wheel and the detail-strip and inking-ribbon being interposed between the hammer and the circumference of the type-wheel the amount being registered will be printed on said detail-strip. As the tooth 27, carried by the wheel 28 on the registering-shaft J, comes in registration with the notch in the wheel 26 a partial revolution will be imparted to the wheel 26, about which the detail-strip winds, and said detail-strip will be drawn forward after the amount has been printed, thus leaving a clear space for the printing of the next amount to be registered. By means of the geared connection between the wheels 35 and 36 rotating with the reels 24 and 32 at each partial revolution of the reel on which the printed detail-strip winds a slight rotary movement is imparted to the reel 32, about which the inking-ribbon passes. In order to prevent said inking-ribbon from slipping when the spool 32 is turned, a friction-roller 36<sup>x</sup>, carried by a yoke which is mounted on a spring-arm, bears against said inking-ribbon and holds the same in contact with the reel 32. As the shaft J is rotating a pin carried thereon strikes against the arm of a bell, which will ring the latter as a signal that the machine is being operated. As the step member F strikes against the lug N<sup>5</sup> on the rack-bar N' the latter is drawn forward, and by

reason of said rack-bar meshing with the teeth of the pinion forming part of the sleeve P the latter turns idly on the outward throw of the reciprocating operating-shaft; but on the return movement of the operating-shaft to its starting position the pawl P<sup>3</sup>, which on the outward throw of the operating-shaft turns idly over the teeth of the ratchet P<sup>4</sup>, will engage one of the teeth on said ratchet and cause the latter to rotate with the sleeve and to describe an arc of a circle corresponding with the longitudinal movement of the rack-bar. As the wheel for registering amounts less than one dollar rotates with the ratchet-wheel P<sup>4</sup> the amount of the registration will appear at a sight-aperture directly over the registering-wheel. When the cent registering-wheel Q makes a complete revolution, the single tooth Q<sup>2</sup> on the disk Q', which rotates with the registering-wheel Q, will engage one of the notches Q<sup>5</sup> in the intermittent wheel Q<sup>4</sup>, which is mounted on a counter-shaft Q<sup>3</sup>, thus imparting a partial revolution to said wheel Q<sup>4</sup>, which in turn will cause the gear-wheel Q<sup>6</sup> to make a partial revolution, and said wheel Q<sup>6</sup>, meshing with the gear-wheel R, which is in engagement with the dollar registering-wheel R<sup>2</sup>, will cause said dollar registering-wheel to make a partial revolution. The registered amount being thus transferred, the operation may be repeated, and the highest amount on the cent registering-wheel will be transferred at each revolution of the latter.

When it is desired to register an amount of one dollar or more, the mechanism for registering purchases amounting to less than a dollar remains idle, while the dollar step member E is turned so that one of its steps will trip against a lug N<sup>2</sup> on the rack-bar N as the extensible shaft is driven forward. Said rack-bar N meshing with the pinion P<sup>7</sup> will cause the latter to rotate, and the pawl S', pivoted to the disk S on the shaft P', will turn idly over the series of internal teeth on the wheel R<sup>2</sup>, and when the operating-shaft is drawn to its farthest outward throw and back to return to its starting or normal position said pawl S' will engage one of the internal teeth S<sup>2</sup> on the dollar registering-wheel R<sup>2</sup> and cause the latter to rotate with said shaft P' to an extent corresponding to the longitudinal movement of the rack-bar N. As the dollar registering-wheel R<sup>2</sup> begins to rotate with the shaft said wheel will be disengaged from the teeth *r* on the disk R' and said disk and the gear-wheel R will be forced laterally on the shaft P' away from the dollar-wheel R<sup>2</sup> and under the tension of the spring R<sup>5</sup>, and the gear-wheel R and disk R' secured thereto will be held from rotation by geared connections with the gear-wheel Q<sup>6</sup>, and after the reciprocating operating-shaft has returned to its normal or starting position and the shaft P' also to its starting position the spring R<sup>5</sup> will throw the disk R' so that its laterally-disposed teeth will be in their normal position or in mesh with the teeth on the face of

the registering-wheel  $R^2$  and the registered amount will appear at a sight-aperture directly over the registering-shaft. It will thus be noted that when purchases amounting to  
 5 a dollar or more are registered by means of the rotary movement imparted to the registering mechanism when the shaft  $P'$  is actuated the mechanism for registering purchases of less than one dollar remains idle, but at  
 10 the moment a registration of one dollar or more has been made the connections between the dollar registering and the transferring mechanism are automatically thrown into gear, so that transfers from the cent to the  
 15 dollar wheels may be made at any time.

At each revolution of the dollar registering-wheel  $R^2$ , by means of the combined star and pinion wheel, which is mounted on the stub-shaft, one of the teeth of said star-wheel will  
 20 engage a notch in the disk  $R^6$  and impart a partial revolution to said star-wheel, which in turn will communicate a partial rotary movement to the second dollar registering-wheel  $T$ , and by means of a similar transferring mechanism at each revolution of the  
 25 wheel  $T$  the amount will be transferred to the third dollar registering-wheel through the pinion  $R^{11}$ .

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

1. In a cash-register, a rotary, reciprocating operating-shaft, a registering mechanism actuated thereby, a handle for rotating said  
 35 shaft, a crank, connection between the latter and said shaft, whereby the shaft is given a longitudinal movement, a type-carrier, and connections intermediate the shaft and type-carrier, whereby the two are caused to rotate  
 40 in unison.

2. In a cash-register, a reciprocating operating-shaft, crank mechanism for operating the latter, a type-wheel actuated by said operating-shaft, and a platen actuated by the  
 45 crank mechanism.

3. In a cash-register, a rotatable, reciprocating operating-shaft, an indicating mechanism controlled by the rotation of said shaft, a registering mechanism controlled by the  
 50 longitudinal movement of said shaft, a handle adapted to rotate said shaft axially, a type-carrier coöperating with said handle, a platen and mechanism for contacting the platen and type-carrier, and a second handle  
 55 controlling the longitudinal movement of the shaft and said contacting mechanism.

4. In a cash-register, a rotatable, reciprocating, operating-shaft, a handle for rotating same, a crank adapted to reciprocate said  
 60 shaft, a type-carrier, connections intermediate said operating-shaft and type-carrier, whereby shaft and type-carrier are caused to rotate in unison, and means for feeding a paper strip adjacent to the latter.

5. In a cash-register, a rotary reciprocating operating-shaft, a crank-shaft and crank-

handle secured thereto, a loosely-mounted plate carried by the reciprocating shaft, and crank-and-pitman connections between said plate and the crank-shaft, as set forth. 70

6. In a cash-register, a rotary reciprocating operating-shaft, and crank-shaft and crank-handle secured to said operating-shaft, a swivel-plate mounted on said operating-shaft, pitman-and-crank connections between  
 75 said plate and the crank-shaft, and a sliding guide-rod secured to the swivel-plate, and working in an aperture in the frame, as set forth.

7. In a cash-register, a reciprocating operating-shaft, a handle for rotating and a crank mechanism for longitudinally actuating said shaft, a type-carrier and means intermediate the latter and said shaft for operating the type-carrier, a spring-actuated platen and a  
 85 cam on the crank-shaft for tripping said platen, as set forth.

8. In a cash-register, a rotary and longitudinal movable operating-shaft, an indicating-dial mounted about and rotating with said  
 90 shaft, crank mechanism for imparting a longitudinal movement to the operating-shaft, registering mechanism operated by the said operating-shaft, a type-wheel rotating in unison with said dial, a spring-actuated platen  
 95 and means intermediate the latter and said crank mechanism for throwing said platen up against the type-carrier, as set forth.

9. In a cash-register, a rotary and reciprocating operating-shaft, a dial mounted about  
 100 and rotating therewith, a registering mechanism controlled by the rotary and longitudinal movement of said shaft, a crank mechanism for operating the shaft longitudinally, a type-carrier and means for rotating same  
 105 in unison with said dial, a spring-actuated platen driven against the type-wheel at each revolution of the crank mechanism, as set forth.

10. In a cash-register, the combination with  
 110 the rotary and reciprocating operating-shaft, a dial rotating therewith, a registering mechanism controlled by the rotary and longitudinal movement of said shaft, a crank-shaft and connections between the latter and said  
 115 operating-shaft for reciprocating said operating-shaft, a type-wheel rotating in unison with said dial, a spring-actuated platen, a trip for actuating the latter, which rotates with the crank-shaft, as set forth. 120

11. In a cash-register, the combination with the rotary and reciprocating operating-shaft, the dial rotating therewith, the registering mechanism operated by the longitudinal movement of said shaft, type-wheel and  
 125 geared connection between the latter and said operating-shaft, whereby the type-wheel and dial rotate in unison, a crank and its connections with said operating-shaft, a spring-actuated platen-carrying lever, a cam mounted  
 130 on said shaft and having an offset in its circumference in which one end of said lever

is designed to be sprung at each revolution of the crank-shaft, whereby the platen is thrown against the type-wheel.

12. In a cash-register, the combination with the rotary and reciprocating operating-shaft, the dial rotating therewith, the registering mechanism operated by the longitudinal movement of said shaft, the type-wheel and geared connection between the latter and said operating-shaft, whereby the type-wheel and dial rotate in unison, a crank and its connections with said operating-shaft, a spring-actuated platen-carrying lever, a cam mounted on said shaft, and having an offset in its circumference, which offset has an abrupt wall at one end into which the end of the platen-carrying lever is adapted to be sprung at each revolution of the shaft, as set forth.

13. In a cash-register, the combination with the rotary and reciprocating operating-shaft, the dial rotating therewith, the registering mechanism operated by the longitudinal movement of said shaft, the type-wheel and geared connection between the latter and said operating-shaft, whereby the type-wheel and dial rotate in unison, a crank and its connections with said operating-shaft, a spring-actuated pivoted and angled platen-carrying lever, a cam rotating with the crank-shaft and having in its circumference an offset with an abrupt end wall and curved bottom merging into the circumference of its cam, the end of said lever adapted when opposite the offset to be sprung therein at each revolution of the crank-shaft, and throw the platen up against the type-wheel, as set forth.

14. In a cash-register, a registering-shaft, dollar and cent registering-wheels loosely mounted thereon, geared connection between said wheels, said dollar-wheel having a sliding movement longitudinally on the registering-shaft, while in gear, and means for rotating said dollar-wheel independently of the cent-wheel.

15. In a cash-register, a registering-shaft, dollar and cent registering-wheels loosely mounted thereon, geared connection between said wheels, said dollar-wheel having a yielding spring-actuated movement on the registering-shaft when in gear, whereby the dollar-wheel may rotate independently of the cent registering-wheel.

16. In a registering mechanism for a cash-register, the registering-shaft, the cent and dollar registering-wheels loosely mounted thereon, a loosely-mounted yielding gear-wheel on said shaft, a ratchet-disk turning with the latter and which normally engages and rotates said dollar-wheel in one direction, the latter being allowed to register independent of the ratchet-disk, and means for transmitting an intermittent rotary movement from the cent-wheel to said gear-wheel, as set forth.

17. In a registering mechanism of a cash-register, the registering-shaft, the cent and dollar registering-wheels, yielding gear-wheel

and ratchet-disk, the sleeve, pawl carried thereby, and the ratchet-wheel loosely mounted on said shaft, the adjacent faces of said dollar-wheel and ratchet-disk having intermeshing teeth, a spring for holding same in mesh with one another, and means for transmitting an intermittent rotary motion from the cent registering-wheel to said ratchet-disk.

18. In a registering mechanism of a cash-register, the registering-shaft, the cent and dollar registering-wheels and sliding gear-wheel, and ratchet-disk rotating therewith, loosely mounted thereon, the adjacent faces of said dollar-wheel and ratchet-disk having intermeshing teeth, a spring for holding same in mesh with one another, means for transmitting an intermittent rotary motion from the cent registering-wheel to said gear-wheel, the dollar-wheel adapted to rotate independently of the cent registering-wheel.

19. In a registering mechanism of a cash-register, a registering-shaft, a dollar and a cent registering-wheel loosely mounted thereon, a sliding and spring-actuated gear-wheel loosely journaled on said shaft, a disk secured to said gear-wheel and having a series of laterally-disposed ratchet-teeth normally held in mesh with teeth on the face of said dollar-wheel, sliding geared connection between said cent registering-wheel and the loosely-mounted gear-wheel, whereby an intermittent rotary motion is imparted to the latter, said dollar registering-wheel adapted to rotate independently of the cent-wheel, as set forth.

20. In a registering mechanism for a cash-register, the combination with the registering-shaft, the dollar and cent registering-wheels loosely journaled thereon, a sliding and spring-actuated gear-wheel loosely mounted on said shaft, a disk secured to said geared wheel, intermeshing teeth on the adjacent faces of said disk and dollar registering-wheel, which are normally held in contact by said spring, geared connections between the cent-registering and loosely-mounted gear-wheel, a pawl rotating with the registering-shaft, and engaging internal ratchet-teeth on the dollar-wheel, whereby the latter is allowed to rotate in one direction independently of the cent registering-wheel, as set forth.

21. In a registering mechanism for cash-registers, the combination with the registering-shaft, the cent registering-wheel and the sliding and spring-actuated gear-wheel loosely journaled on said shaft, means for transmitting motion from said cent registering-wheel to the geared wheel, a disk secured to the face of the latter and having a series of laterally-disposed ratchet-teeth, a dollar registering-wheel having a series of ratchet-teeth on its face adjacent to said disk, and an internal series of ratchet-teeth and a pawl rotating with said shaft and engaging said internal series of teeth, as set forth.

22. In a registering mechanism of a cash-register, a registering-shaft, a cent registering-wheel loosely journaled thereon, means for rotating said wheel, a single-toothed wheel  
 5 rotating with said registering-wheel, an intermittent wheel actuated by said toothed wheel, a dollar registering-wheel loosely mounted on the registering-shaft, lateral and internal  
 10 ratchet-teeth on said dollar registering-wheel, a pawl rotating with the registering-shaft, and engaging said internal teeth, a sliding and spring-actuated and loosely-mounted gear-wheel, a disk secured to the latter, and provided with a circular series of teeth on its  
 15 face, designed to engage teeth of said dollar registering-wheel, a second gear-wheel actuated by said intermittent wheel and having an intermeshing contact with said loosely-mounted sliding gear-wheel, as set forth.

23. In a registering mechanism for a cash-register, the combination with the registering-shaft, the cent registering-wheel and means for operating same, the loosely-mounted and sliding and spring-actuated gear-wheel, and  
 25 ratchet-ring with teeth thereon rotating with said gear-wheel, and connections between same and the cent registering-wheel, the dollar-wheel having a series of lateral and internal teeth, said lateral teeth engaging the  
 30 teeth on the ratchet-ring, the transferring-disk secured to said dollar-wheel, a pawl carried by said shaft and engaging the internal series of teeth of the dollar registering-wheel, as set forth.

24. In a cash-register, a registering mechanism comprising a shaft, a sleeve mounted loosely thereon, means for rotating the shaft and sleeve independently of each other, a  
 35 pawl carried by said sleeve, a cent numeral-wheel loose upon said shaft, adapted to be ro-

tated by said sleeve-pawl, a series of dollar numeral-wheels loose upon said shaft, a pawl-and-ratchet connection between said shaft and the unit-dollar numeral-wheel, intermittent gear connection between the several dol-  
 45 lar numeral-wheels, a gear-wheel and ratchet-disk secured thereto, loose upon said shaft, which latter is normally in detachable engagement with said unit-dollar numeral-wheel, intermittent gear intermediate the said  
 50 gear-wheel and the cent numeral-wheel, and means for automatically throwing said gear-wheel into and out of engagement with said dollar numeral-wheel.

25. In a cash-register, a shaft, a dollar numeral-wheel loose upon said shaft, a pawl-and-ratchet connection between said shaft and dollar numeral-wheel, a gear-wheel and ratchet-disk secured to the said gear-wheel,  
 60 loose upon said shaft and sliding thereon, ratchet-teeth upon the adjacent faces of said ratchet-disk and dollar numeral-wheel adapted to engage each other and rotate together in one direction, a spring adapted to press  
 65 the ratchet-teeth of said gear-wheel normally into engagement with the ratchet-teeth of the dollar numeral-wheel, whereby when the gear-wheel is held against rotation, the wedge-like action of the inclined faces of the ratchet-teeth of the dollar numeral-wheel, will over-  
 70 come the stress of said spring, and force the said gear-wheel along said shaft out of engagement with the dollar numeral-wheel.

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

DANIEL W. HARPER.

Witnesses:

WILLIAM F. DEWEY,  
 JAS. W. CORWIN.