

No. 631,488.

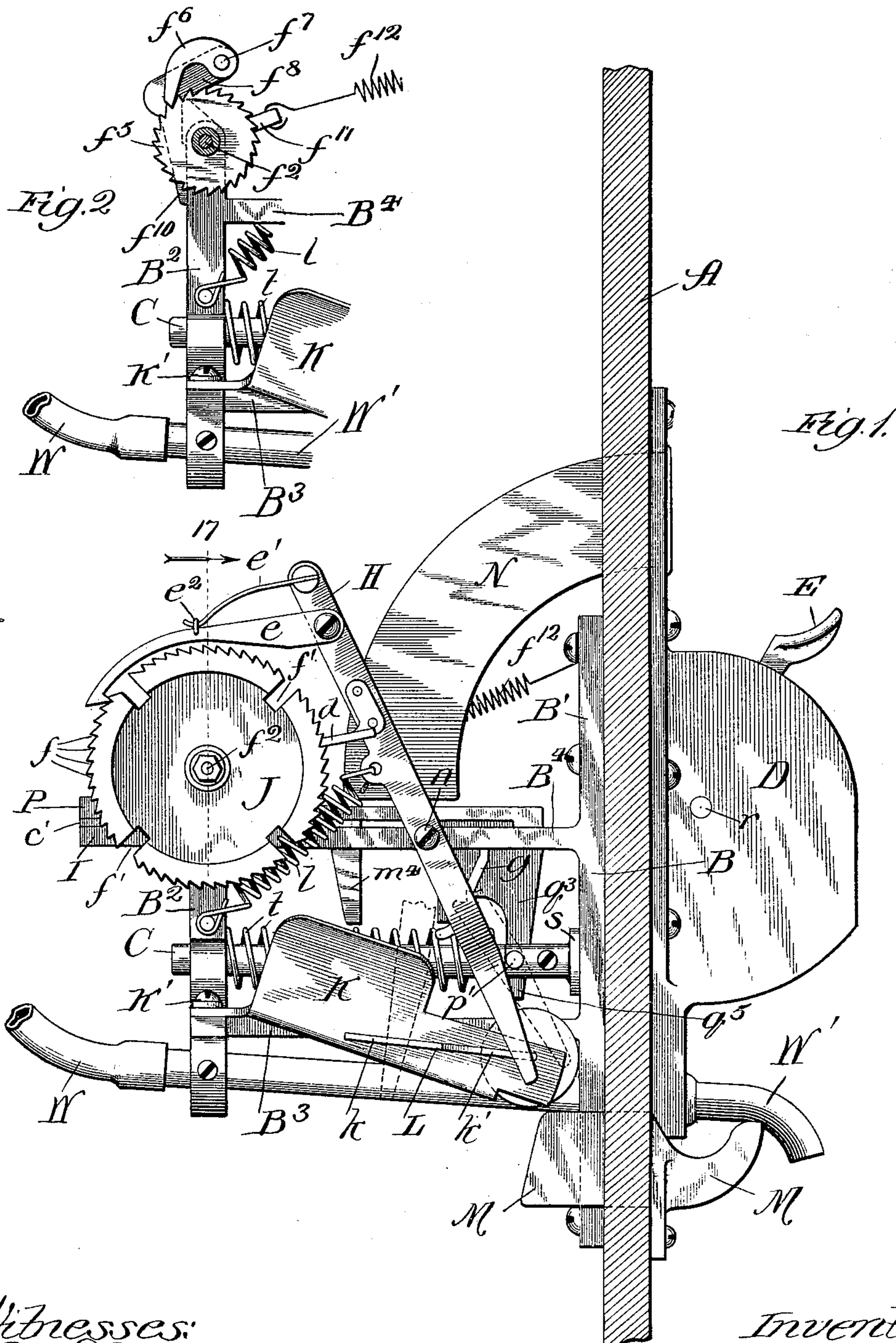
Patented Aug. 22, 1899.

W. L. HARRIS.  
VENDING MACHINE.

(Application filed Oct. 29, 1898.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:  
E. C. Gaylord,  
L. S. Altier

Inventor:  
William L. Harris,  
By Syrenforth & Syrenforth,  
Attys.



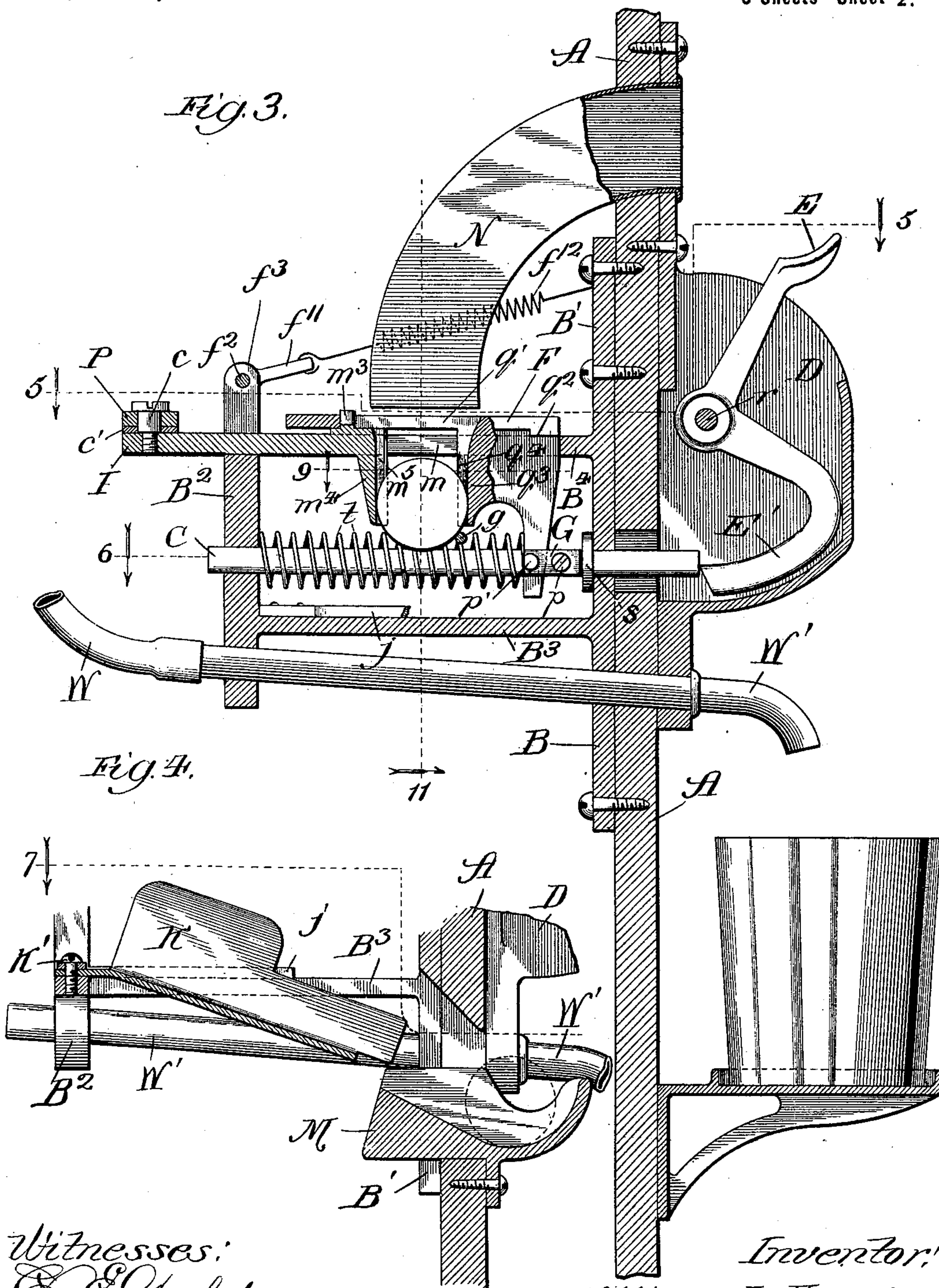
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Witnesses:  
E. S. Gaylord,  
J. S. P. P. P.

Inventor:  
William L. Harris,  
By Syrenforth & Syrenforth,  
Attys.



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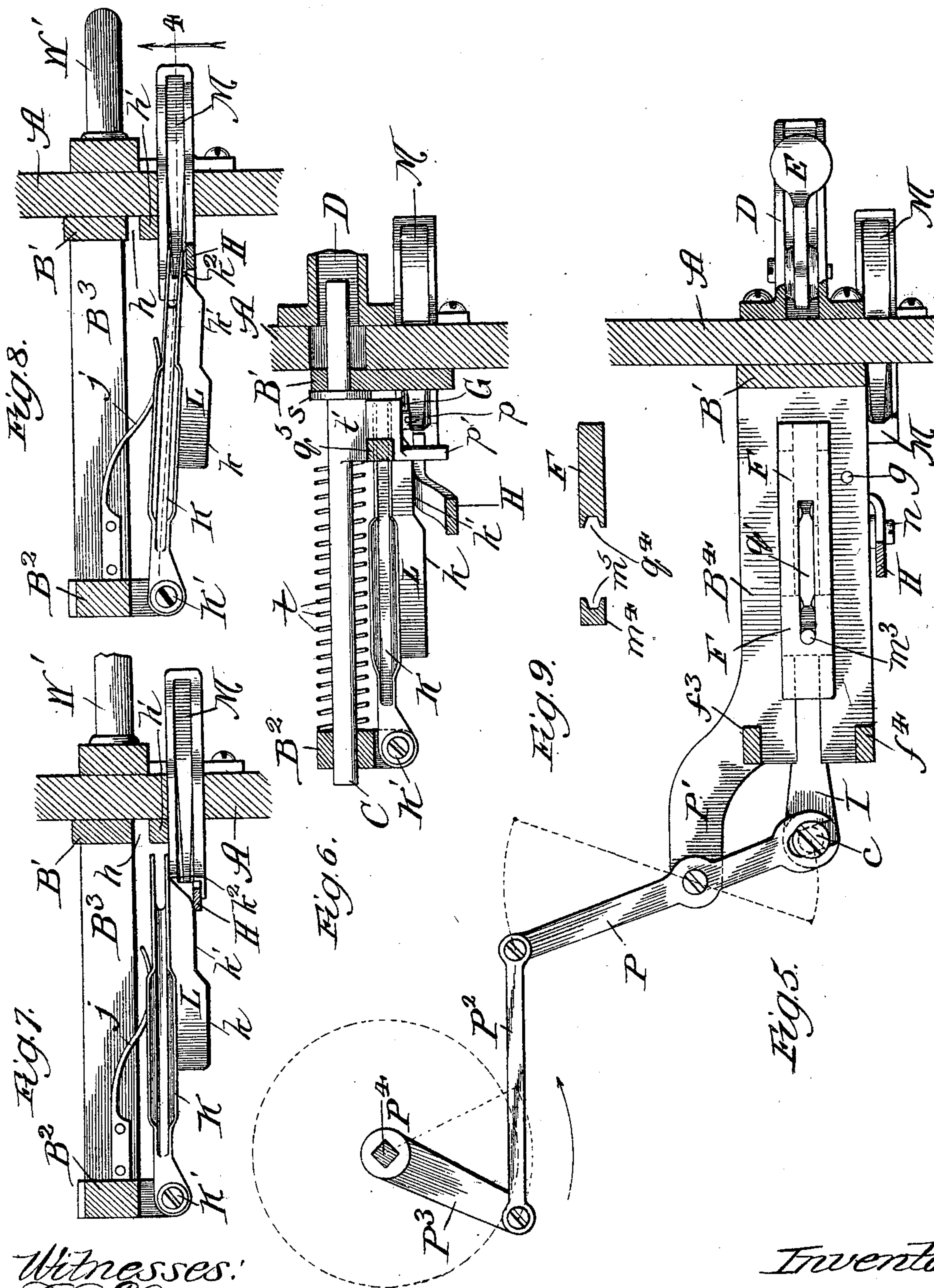
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5 Sheets—Sheet 3.

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Witnesses:  
Chas. C. Gaylord,  
Lute S. Altis

Inventor:  
William L. Harris,  
By Dyrenforth & Dyrenforth,  
Attorneys

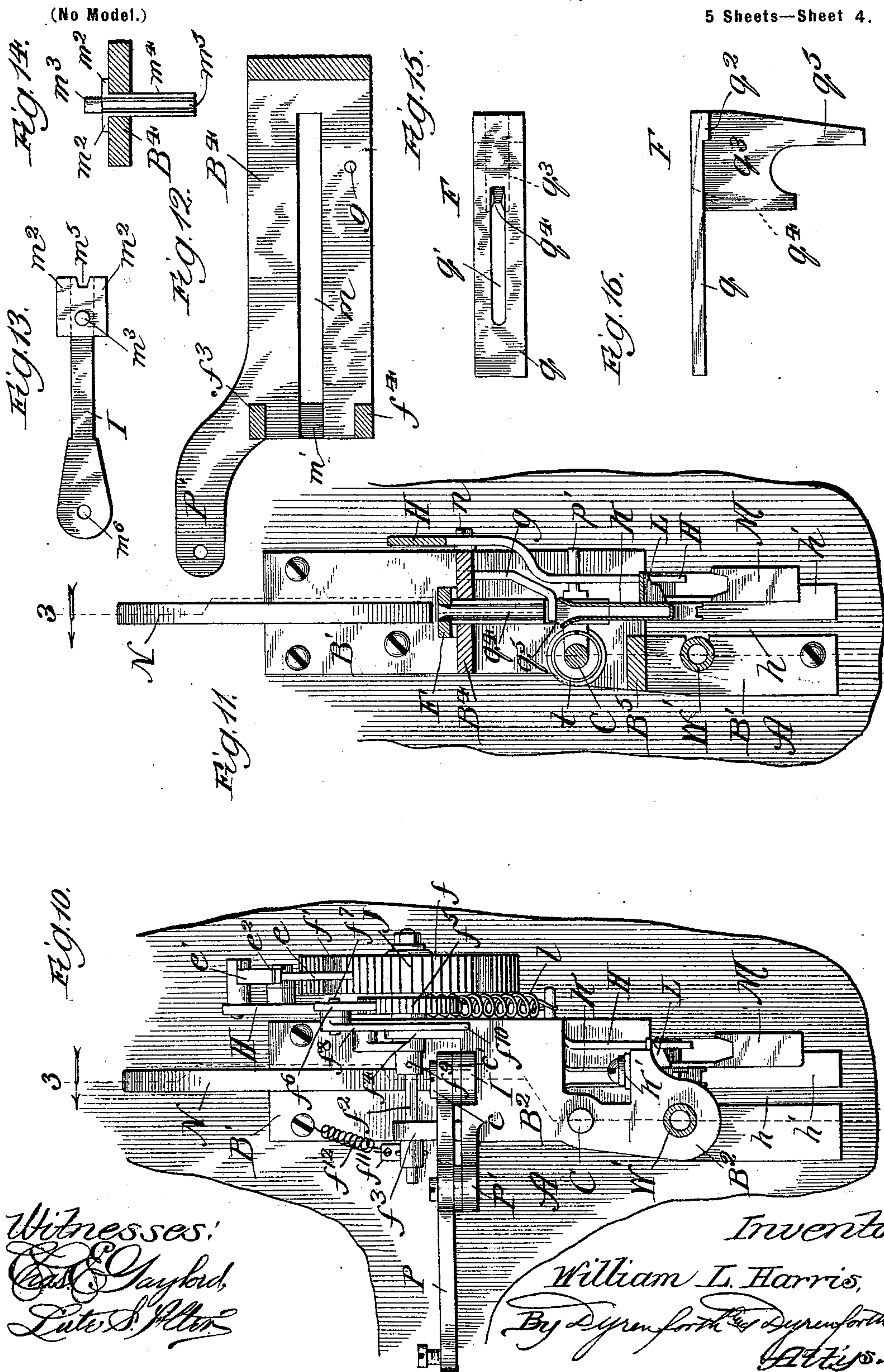
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5 Sheets—Sheet 4.





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5 Sheets—Sheet 5.

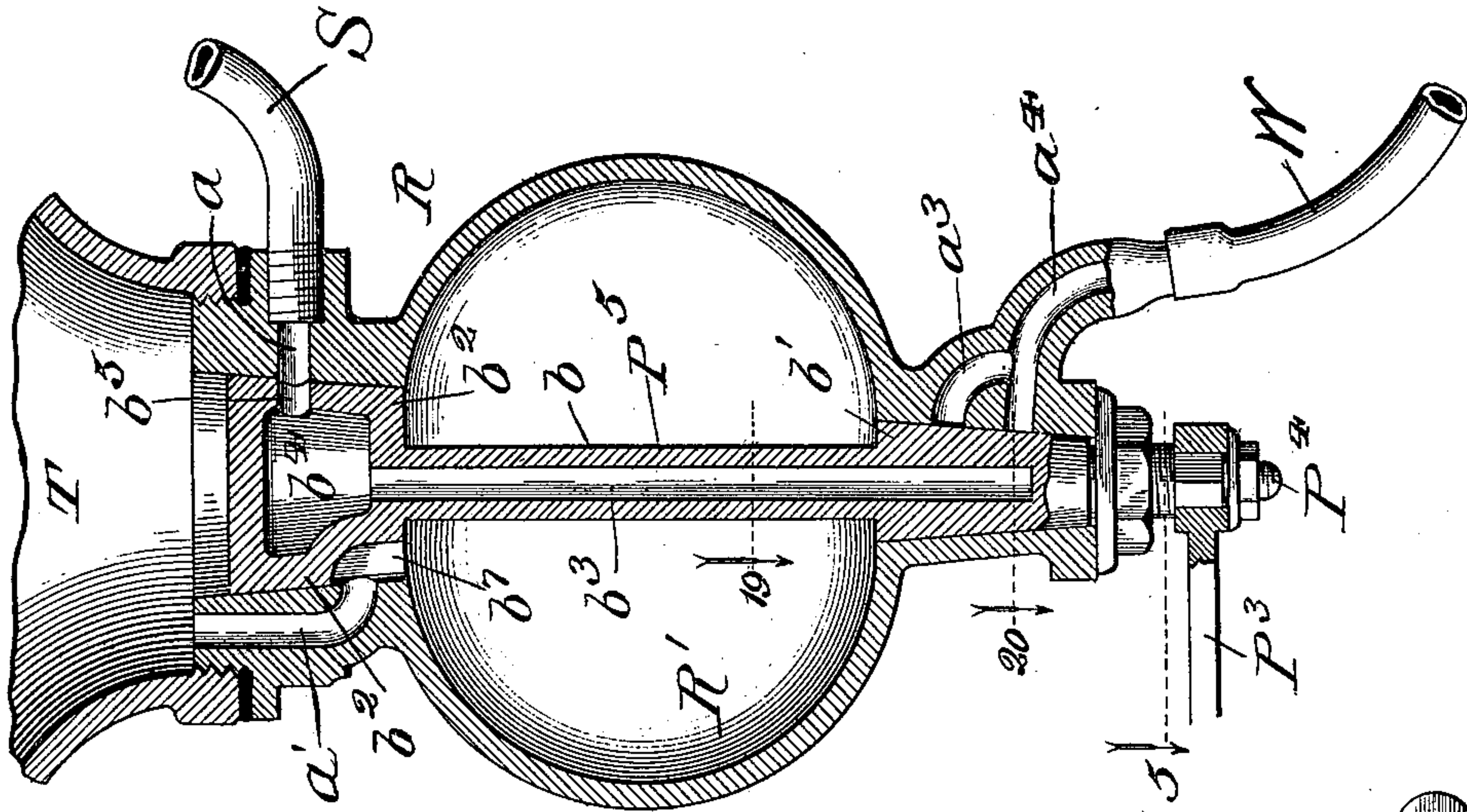


Fig. 18.

Fig. 19.

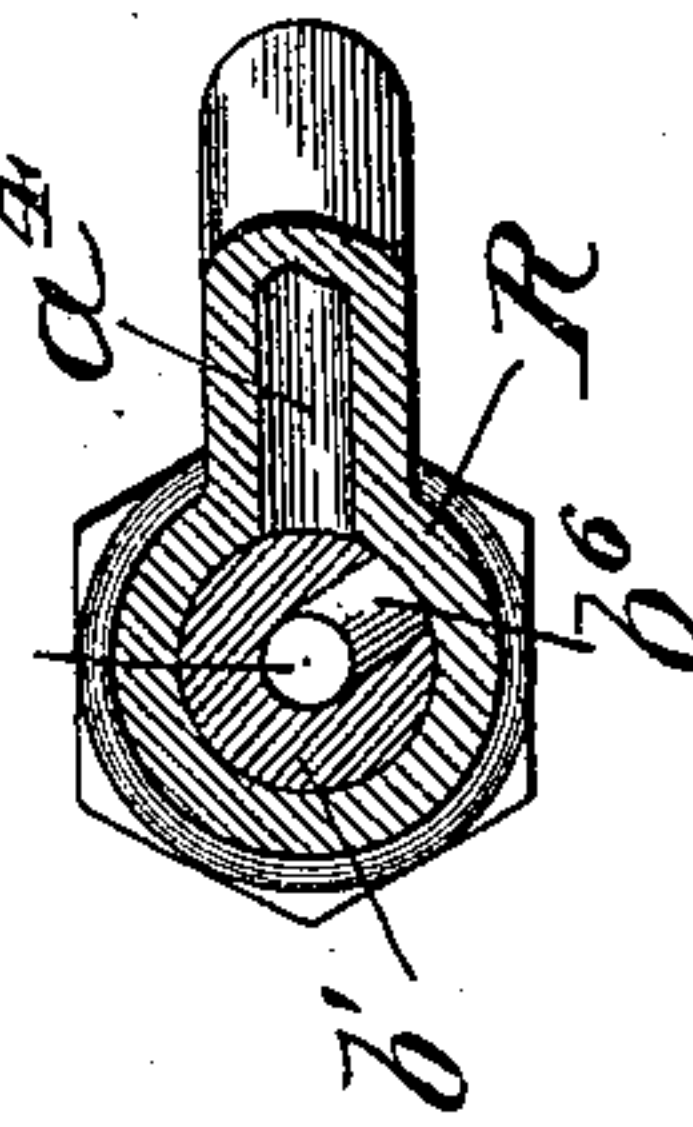
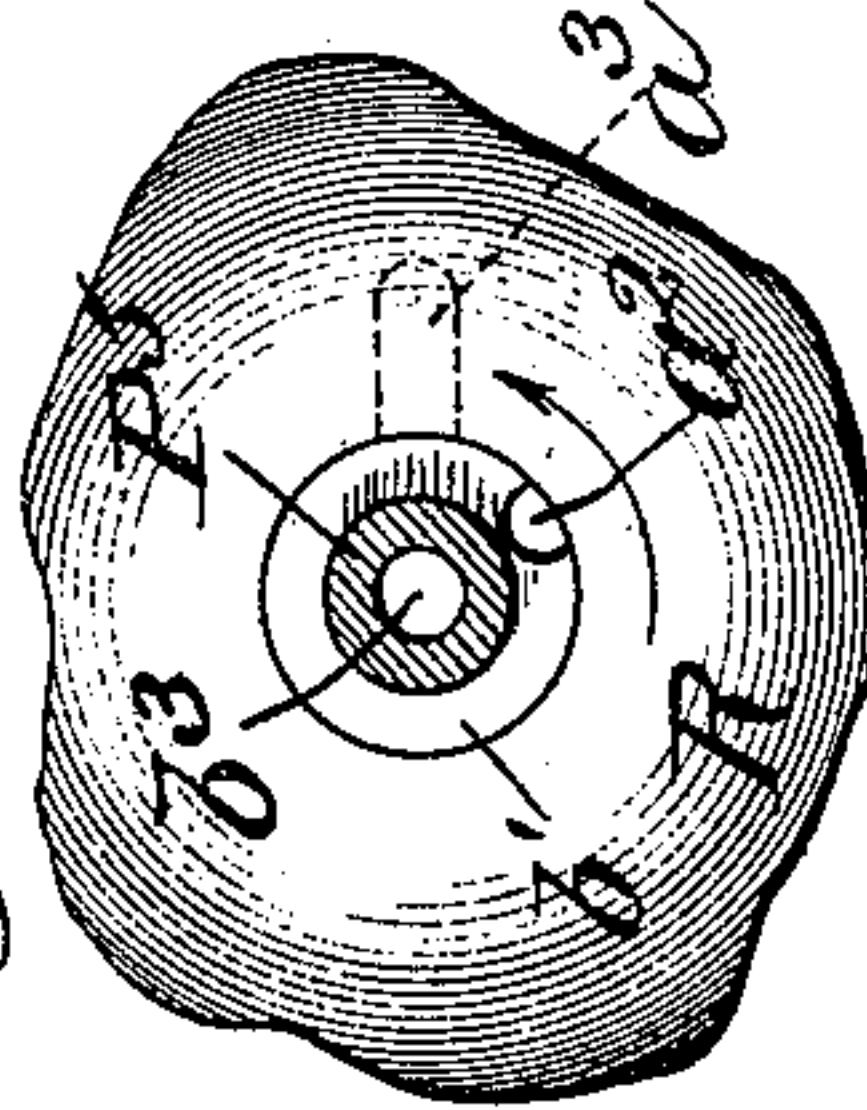
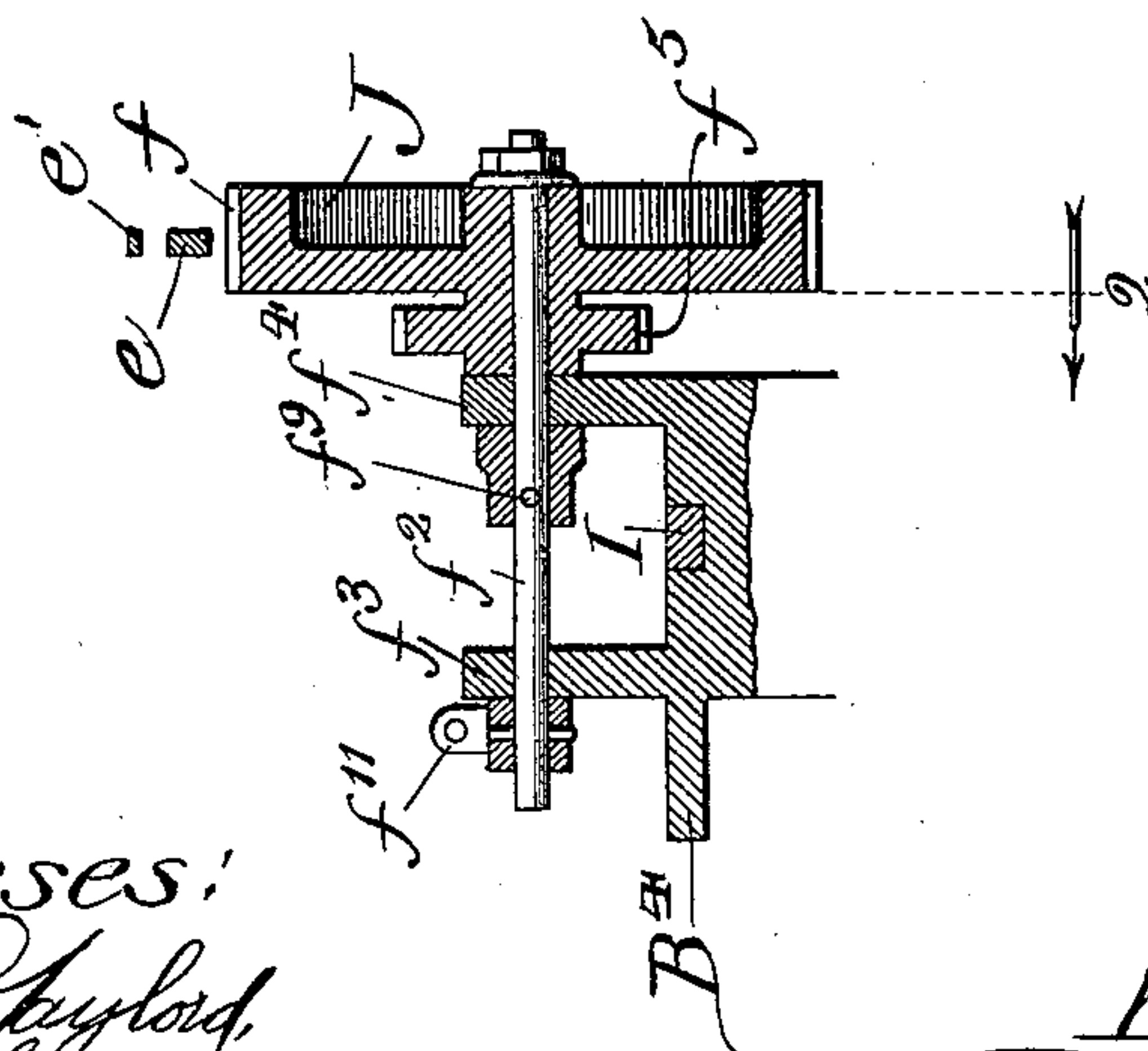


Fig. 20.

Fig. 17.



Witnesses:  
E. S. Chylod,  
L. S. Alter

Inventor:  
William L. Harris,  
By Dymally & Dymally,  
Attorneys



# UNITED STATES PATENT OFFICE.

WILLIAM L. HARRIS, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO  
ARTHUR H. PEIRCE AND JAMES B. McMAHON, OF SAME PLACE.

## VENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,488, dated August 22, 1899.

Application filed October 29, 1898. Serial No. 694,915. (No model.)

*To all whom it may concern:*

Be it known that I WILLIAM L. HARRIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Vending-Machines, of which the following is a specification.

My invention relates more particularly to apparatus for automatically vending liquid refreshments, though certain features of the invention are applicable to automatic vending-machines for other purposes.

My object is to provide coin-controlled mechanism which shall insure at all times a return of a quantity of beverage for the money dropped into the machine and shall at times under chance conditions return to the purchaser the coin dropped into the machine.

My further object is to provide improved means for measuring the liquid to be vended, making provision therein for the mixing of a diluent with the flavoring fluid used.

In the accompanying drawings, Figure 1 is a broken sectional view of the front portion of a vending-fountain embodying my improvements, the section being vertical and taken from front to rear; Fig. 2, a broken section taken as indicated at line 2 of Fig. 17 and showing a detail of the mechanism for rotating a slotted disk employed; Fig. 3, a broken vertical section taken as indicated at the corresponding line on Figs. 10 and 11; Fig. 4, a broken vertical section taken on line 4 of Fig. 8; Fig. 5, a broken horizontal section taken on the correspondingly-numbered lines of Figs. 3 and 18; Fig. 6, a broken horizontal section on line 6 of Fig. 3; Fig. 7, a broken horizontal section on line 7 of Fig. 4; Fig. 8, a similar view with the pivoted discharge-chute employed shifted; Fig. 9, a horizontal section on line 9 of Fig. 3; Fig. 10, a rear elevational view showing the slotted disk and mechanism for rotating it; Fig. 11, a vertical transverse section taken on line 11 of Fig. 3; Fig. 12, a plan sectional view of the bracket supporting the operative parts, the section being taken on line 5 of Fig. 3; Fig. 13, a plan view of a slide-bar actuated through the medium of a coin and serving to operate the valve-moving mechanism; Fig. 14, an end view of the same bar shown in its position on

the bracket; Figs. 15 and 16, plan and side elevational views, respectively, of a coin-engaging slide employed; Fig. 17, a sectional view on line 17 of Fig. 1; Fig. 18, a broken vertical section through the liquid-measuring apparatus connected with the fountain; Fig. 19, a broken plan section on line 19 of Fig. 18, and Fig. 20 a broken plan section on line 20 of Fig. 18.

A is the front wall of the vending-machine, from the inner surface of which projects rearwardly a bracket B, upon which are supported certain of the movable parts. The bracket comprises vertical front and rear members B<sup>1</sup> B<sup>2</sup>, respectively, and lower and upper horizontal members B<sup>3</sup> B<sup>4</sup>, respectively. C is a reciprocable horizontally-disposed plunger-rod moving in guides or perforations in the vertical portions of the bracket. The rod C projects at its front end through the front wall of the machine and is held normally in its forward position by a coil-spring t thereon, confined between the rear vertical member B<sup>2</sup> of the bracket and a boss t', Fig. 6, on the rod. A collar s on the rod serves to limit its forward movement.

D is a forward-projecting housing-like bracket in which is pivoted on a pin r a bell-crank-operating lever E, the lower end E' of which engages the forward-projecting end of the plunger-rod and serves to press the latter inwardly against its spring. Attached to the plunger-rod to move therewith is a coin-engaging slide F, having a horizontal member q, provided with a slot q' and lugs q<sup>2</sup>, and having also a vertical member q<sup>3</sup>, provided at its front edge with a groove q<sup>4</sup> and at its rear with a downward-projecting arm q<sup>5</sup>. The slide F is secured to the boss t' on the plunger-rod C, Fig. 6, by means of a clamp G, fastened by a screw p. The clamp G is provided with a laterally-projecting lug p', which in the movement of the plunger-rod engages the lower portion of the lever E, pivoted near its center at a point n to the upper member B<sup>4</sup> of the bracket B. The lugs q<sup>2</sup> of the slide F rest and slide upon the upper horizontal member B<sup>4</sup> of the bracket B, while the vertical portion of said slide projects downwardly through a slot m in said horizontal member. Beneath the rear end of the slide



F projects the forward end of a slide-bar I, which rests partially upon a depressed portion  $m'$  of the vertical member  $B^2$  and is provided with flanges  $m^2$ , which slide on the member  $B^4$ , a pin  $m^3$ , which engages the slot  $q'$  of the slide F, and a downward-projecting member  $m^4$ , supplied with a coin-engaging slot  $m^5$ . The rear end of the bar I is provided with a perforation  $m^6$ , at which point pivotal connection is had with the valve-operating levers. The lever H, which has motion imparted to it in one direction by the plunger-rod C and is drawn in the opposite direction by a spring  $l$ , serves through the medium of suitable connections to impart motion in one direction to a slotted disk or wheel J, which has to do with the chance feature of the device, and to swing or shift a coin-discharge chute K, pivoted at  $K'$ , which regulates the discharge as it in turn is itself regulated in its own position by the disk and lever. The pivoted trough or discharge-chute is provided on one side with a cam L, Fig. 8, having a high surface  $k$  and a lower surface  $k'$ . The end of the trough projects somewhat beyond the front end of the cam and affords a still lower surface  $k^2$ , which is virtually a continuation of the cam-surface. The cam-surface is engaged by the lower end of the lever H, the trough being forced toward the lever by a spring  $j$ .

The three cam-surfaces  $k$ ,  $k'$ , and  $k^2$  correspond to three positions of the trough K, according to the surface engaged by the lower end of the lever H. When the surface  $k$  is engaged, the trough is moved against its spring close up against the plunger-rod, in which position it registers with a slot  $h$ , Figs. 7 and 10, in the front upright  $B'$  of the bracket B and any coin in the trough drops into a suitable receptacle (not shown) within the fountain. When the surface  $k'$  is engaged, the end of the trough is closed by a portion  $h'$  of the upright  $B'$  and the coin is prevented from escaping. When the surface  $k^2$  is engaged, the lower end of the trough is forced by its spring as far as possible from the plunger-rod and in such a position registers with a trough M, which extends through the front wall of the machine and serves to return the coin when the parts of the mechanism assume such a relative position as to permit this action.

A coin-chute N serves to conduct the coin to the slot  $q'$  in the slide F, whence it falls into the grooves on the downward extensions on this slide and the coacting slide-bar I. The coin is prevented from falling too far previous to the actuation of the bell-crank lever E by a short wire stop  $g$ , Figs. 1 and 3, fixed firmly in the horizontal member  $B^4$ , from which it depends, and provided with a horizontal portion which projects transversely of the coin, as shown in Fig. 3.

The disk or wheel J is provided with peripheral inclined teeth  $f$  and with slots  $f'$ . It is journaled loosely on a shaft  $f^2$ , Fig. 17,

which is in turn journaled in uprights  $f^3$   $f^4$  at the rear upper corners of the bracket B. The wheel is provided with a projecting hub equipped with a ratchet-wheel  $f^5$ , engaged by a pawl  $f^6$ , Figs. 2, 10, and 17, pivoted at  $f^7$  on an arm  $f^8$ , rigidly attached by collar-and-pin connection at  $f^9$  to the shaft  $f^2$ . The arm  $f^8$  projects downwardly to afford a stop  $f^{10}$ , which limits the turning movement of the shaft  $f^2$  in one direction. At the opposite end the shaft is provided with a rigidly-attached arm  $f^{11}$ , to which is attached a coil-spring  $f^{12}$ , connected with an immovable part of the frame, as shown in Figs. 3 and 10.

Continuing now with a description of the mechanism for imparting an initial movement to the wheel J, the lever II is equipped with a pivoted forwardly-acting pawl  $e$ , which engages the ratchet-teeth on the periphery of the wheel. This pawl is held under a certain compression against the wheel when the parts are in the position shown in Fig. 1 by a spring  $e'$ , firmly fixed at one end to the lever II and linked at the other end to the pawl  $e$  by a small loop or ring  $e^2$ . The lever II is supplied with a lug or stop  $d$ , which rests normally against the notched periphery of the wheel J. When this lug bears upon the periphery, the position of the lever is such as to engage the cam-surface  $k'$  and hold the trough K in such position as to prevent the escape of the coin therefrom, as above explained. When the stop  $d$  drops into one of the peripheral slots, however, the trough is allowed to swing into registry with the return-chute and the coin is returned to the purchaser. The slide-bar I, which is actuated rearwardly through the medium of the slide F and a coin interposed between said slide and slide-bar, is provided at its rear end with a stud  $c$  and washer  $c'$  and there connects with the slotted end of a horizontally-disposed lever P, Fig. 5, pivotally supported on a rearward projection  $P'$  at the rear end of the bracket B. The opposite end of the lever P is joined by a connecting-rod  $P^2$  to an arm  $P^3$ , rigidly secured to a downwardly-projecting stud  $P^4$  on the lower end of a hollow rotatable measuring-valve  $P^5$ , Fig. 18. The valve  $P^5$  is preferably in the form of a stem  $b$ , provided with heads  $b'$   $b^2$  and supplied with a longitudinal perforation  $b^3$  and enlarged cavity  $b^4$ , serving as the smaller measuring-chamber. Inlet and discharge ports  $b^5$  and  $b^6$ , respectively, lead from the central passage of the valve to the cylindrical surfaces of the valve-heads.

The measuring-valve  $P^5$  fits within a measuring-valve chamber R, having an enlargement  $R'$ , which serves as the larger measuring-chamber. At the upper portion of the valve-chamber wall is a passage  $a$ , communicating with a tube S, which leads to a suitable chamber or fountain (not shown) for holding the flavoring extract used. The passage  $a$  registers with the passage  $b^5$  in the upper valve-head when the parts are in the po-



sition shown in Fig. 18. In this position also a passage  $b^7$  in the upper valve-head registers with a passage  $a^1$ , leading to a water-fountain T. At the lower valve-head is a vertical passage  $a^2$ , Fig. 19, which may be brought into registry with a passage  $a^3$ , leading to a passage  $a^4$  in the lower portion of the valve-chamber wall, the latter passage being also registrable with the passage  $b^6$  in the lower valve-head. The passage  $a^4$  communicates with a tube W, leading to a discharge-spout W', Fig. 3. The relation of the various passages of the valve and valve-chamber named is such that when the lower passages are closed the upper ones are open to allow the two measuring-chambers to fill. Rotation of the arm  $P^3$  on the valve-stem causes the upper passages to cut off simultaneously and immediately thereafter the lower ones to open simultaneously and discharge their contents into the common passage  $a^4$ , where the fluids are mixed and whence they pass to the discharge-spout.

The operation of the machine is readily understood. The purchaser desiring a drink drops a coin into the chute N, whence it passes through the slot  $q'$ , Fig. 3, of the slide F and between what may be termed the "jaws"  $q^3$  and  $m^4$  of the slide and slide-bar, being supported in this position for an instant by the wire stop  $g$ . The purchaser now depresses the bell-crank lever E, thus forcing rearward the plunger-rod and slide F, clamping the coin between the jaws and forcing the slide-bar I backward through the medium of the coin, thereby causing the slide-bar to actuate the valve through the medium of the connecting lever mechanism. Liquid now issues from the fountain, as already described. In its rearward movement the plunger-rod actuates the lever H, drawing the top of said lever forward. This movement rotates the wheel J and, through the medium of the pawl  $f^6$ , produces a torsion in the shaft  $f^2$ , turning the latter through a certain arc. This in turn produces a tension on the spring  $f^{12}$ , connected with the arm  $f^{11}$  on the shaft  $f^2$ . After the lever H has moved a certain distance the pawl  $e$ , carried thereby, becomes disengaged from the ratchet-teeth on the circumference of the wheel, when the shaft is at once thrown in the opposite direction by the force of the spring  $f^{12}$ . In this movement the pawl  $e$  is gradually carried by the upper end of the lever H away from the wheel J, till finally the force exerted through the spring  $e'$  is changed to a lifting force, which suffices to raise the pawl clear from engagement with the periphery of the wheel. The wheel being free to rotate on the shaft in this direction continues to rotate through inertia after the shaft has come to rest by the striking of the arm  $f^{10}$  against a stationary part. When the lever E is released, the stop  $d$  on the lever H is drawn through the force of the spring  $l$  against the periphery of the wheel J. In this position the coin (which at the instant of release of the lever E drops

into the trough K) is prevented from escaping from the trough by engagement with that portion of the upright  $B'$  adjacent to the slot  $h$ . When the rest  $d$  chances to engage one of the slots  $f'$  instead of the lightly-notched periphery of the wheel, the lever H is tilted so far as to cause the lower end to pass the cam L, as shown in dotted lines in Fig. 1, in which case the trough K is forced into registry with the return-chute M and the coin passes outside the casing. As already stated, when the parts are in the position shown in full lines in Fig. 1 the coin is prevented from escaping from the trough K. In such case the coin is freed by the next movement of the plunger-rod, the lower end of the lever engaging the high cam-surface and forcing the pivoted trough into registry with the slot  $h$ , permitting the coin to escape into a suitable collecting-box (not shown) within the casing. It should be added that as the plunger-rod is retracted under the action of its spring, drawing with it the slide F, the rear end of the slot  $q'$  of the latter engages the pin  $m^3$  of the slide-bar I and draws the latter forward to close the valve-discharge ports and open the admission-ports. This loose-joint connection, wherein a coin serves as a medium for transmitting motion to the levers in one direction and means is provided connected with the plunger-rod for effecting a return of the levers to their first position, is deemed an important improvement.

It is obvious that the mechanism described not directly associated with the valve may be employed in machines for vending other articles. Changes in details of construction within the spirit of my invention may be made. I therefore desire to be understood as intending no limitation by the above particular description, except as appears from the appended claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a vending-machine, the combination of a casing, a bracket, a slotted wheel, means for rotating said wheel, actuating means extending through the casing-wall, a pivoted spring-held coin-receiving trough, a coin-returning chute extending through the casing-wall, a coin-feed chute, means engaging said wheel and trough to permit a shifting of the trough, and means actuated through the medium of a coin for effecting a discharge of the article to be vended, substantially as and for the purpose set forth.

2. In a vending-machine, the combination of a casing, a stationary bracket or frame, a wheel provided with a slotted periphery, means for rotating said wheel, a spring-held lever provided with a rest adapted to engage the wheel periphery or slot therein, a pivoted spring-held coin-receiving trough provided with a cam-surface engaging said lever, a projection carried by said plunger-rod for moving said lever, a coin-returning chute extending through the casing with which said piv-



oted trough may be caused to register, and means connected with the slide-bar for effecting a discharge from the machine of the article to be vended, substantially as and for the purpose set forth.

3. In a vending-machine, the combination of a casing, a bracket, a coin-feed chute, a coin-returning chute, pivoted spring-held coin-receiving chute, means for preventing an escape of the coin from said pivoted trough when the latter is in a certain position, means for shifting the trough to cause it to register with said coin-returning chute or to bring its discharge end to the non-discharge position, or to shift it away from said non-discharge position to permit the coin to fall inside the casing, and means provided with coin-receiving slot spring-actuated in one direction and operating through the coin in the other direction to effect a discharge of the article to be vended, substantially as and for the purpose set forth.

4. In a vending-machine, a casing, a bracket, a wheel provided with a slotted periphery, a shaft upon which the wheel is loosely mounted, an arm rigid with the shaft and a spring joining said arm to a stationary part, pawl-and-ratchet connection for causing said shaft to move in one direction with said wheel, means for rotating said wheel in said direction to produce a shaft torsion and tension of the spring connected thereto, a coin-feed chute, a coin-returning chute, a pivoted spring-held coin-receiving trough, means engaging said pivoted trough and said wheel for regulating the position of the trough, and means for effecting a discharge from the machine of the article vended, substantially as and for the purpose set forth.

5. In a vending-machine, the combination of a casing, a bracket, a journaled shaft provided with a rigid arm, a spring joining said arm to a stationary part, a wheel journaled on said shaft having a notched and slotted periphery, pawl-and-ratchet-wheel connection between said slotted wheel and shaft causing them to move together in one direction, a spring-held lever pivoted to said bracket provided with a rest engaging said wheel, a pawl on said lever engaging the notched wheel periphery, a plunger-rod for moving said lever, a spring-held pivoted coin-receiving trough provided with a cam-surface engaging said lever, a coin-returning chute, and means connected with the plunger-rod for effecting a discharge from the machine of the article to be vended, substantially as and for the purpose set forth.

6. In a liquid-dispensing machine, the combination of a casing, a bracket, a plunger-rod, means for reciprocating said rod, a journaled wheel provided with a slotted periphery, a coin-feed chute, a coin-returning chute, a pivoted spring-held coin-receiving trough, a spring-held pivoted lever engaging said trough and serving to shift the same, means for preventing the escape of a coin from said

pivoted trough when in a given position, means connected with said lever and engaging said wheel for rotating it through a given arc in one direction, a spring for impelling the wheel in the opposite direction, a slide connected with said plunger-rod and provided with a slotted horizontal member having a depending coin-engaging jaw, a slide-bar provided with a pin engaging the slot in said slide and equipped beneath said slot with a coin-engaging jaw, a fluid-chamber, a discharge-spout communicating therewith, a valve guarding the discharge, a lever-and-link mechanism connecting slide-bar and valve, substantially as and for the purpose set forth.

7. In a liquid-dispensing machine, the combination of a casing, a bracket, a plunger-rod, means for reciprocating said rod, a journaled wheel provided with a slotted periphery, a coin-feed chute, a coin-returning chute, a pivoted spring-held coin-receiving trough, a spring-held lever pivoted to said bracket and provided with a rest for engaging said wheel periphery, a cam on said pivoted trough engaging said lever through the medium of which the trough is shifted, means for preventing the escape of a coin from the pivoted trough when the latter is in one position and permitting the coin to drop within the casing when it is in another position, means connected with the plunger-rod for moving said lever, means connected with said lever for imparting motion to said wheel, a slide connected with said plunger-rod, a slide-bar loosely connected with said slide, coin-engaging jaws on said slide and slide-bar, a fluid-measuring chamber, a discharge-spout communicating therewith, a valve guarding inlet and outlet of said fluid-chamber, and lever mechanism connecting the valve and slide-bar, substantially as and for the purpose set forth.

8. In a liquid-dispensing machine, the combination of a suitable casing, a liquid-measuring valve-chamber, a liquid-measuring hollow valve therein, a discharge-spout, discharge-passages connecting valve-chamber and the interior of said valve with a common discharge-passage communicating with said discharge-spout, passages leading from separate fluid-supply sources to said valve-chamber and said valve interior and guarded by said valve, said supply and discharge ports being so positioned that the former shall be closed before the latter are opened, and vice versa, means for actuating said valve provided with a coin-passage and dependent on the presence of a coin for actuation in one direction, and a coin-feed chute leading to said coin-passage, substantially as and for the purpose set forth.

9. In a liquid-dispensing machine, the combination with a suitable casing, a liquid-discharge spout, valve-actuating mechanism provided with a coin-passage and dependent on the presence of a coin for actuation in at



least one direction, and a coin-chute leading  
to said passage, of the herein-described liq-  
uid measuring and mixing device, compris-  
ing a valve-chamber supplied with a measur-  
5 ing-chamber, a rotatable valve therein sup-  
plied with a measuring-chamber, supply-  
ports leading from different sources of fluid-  
supply to said chambers and guarded by the  
upper portion of said valve, discharge-ports  
10 leading from said chambers and guarded by  
the lower portion of said valve, and a com-

mon discharge-passage connecting discharge-  
ports with the discharge-spout, said supply  
and discharge ports being arranged to cause  
the former to open after the latter have 15  
closed, and vice versa, substantially as and  
for the purpose set forth.

WILLIAM L. HARRIS.

In presence of—

D. W. LEE,

R. T. SHEUERS.