

(No Model.)

3 Sheets—Sheet 1.

D. H. BACON & C. C. HILL.

COIN ACTUATED DEVICE FOR VENDING OR OTHER PURPOSES.

No. 471,712.

Patented Mar. 29, 1892.

Fig. 2.

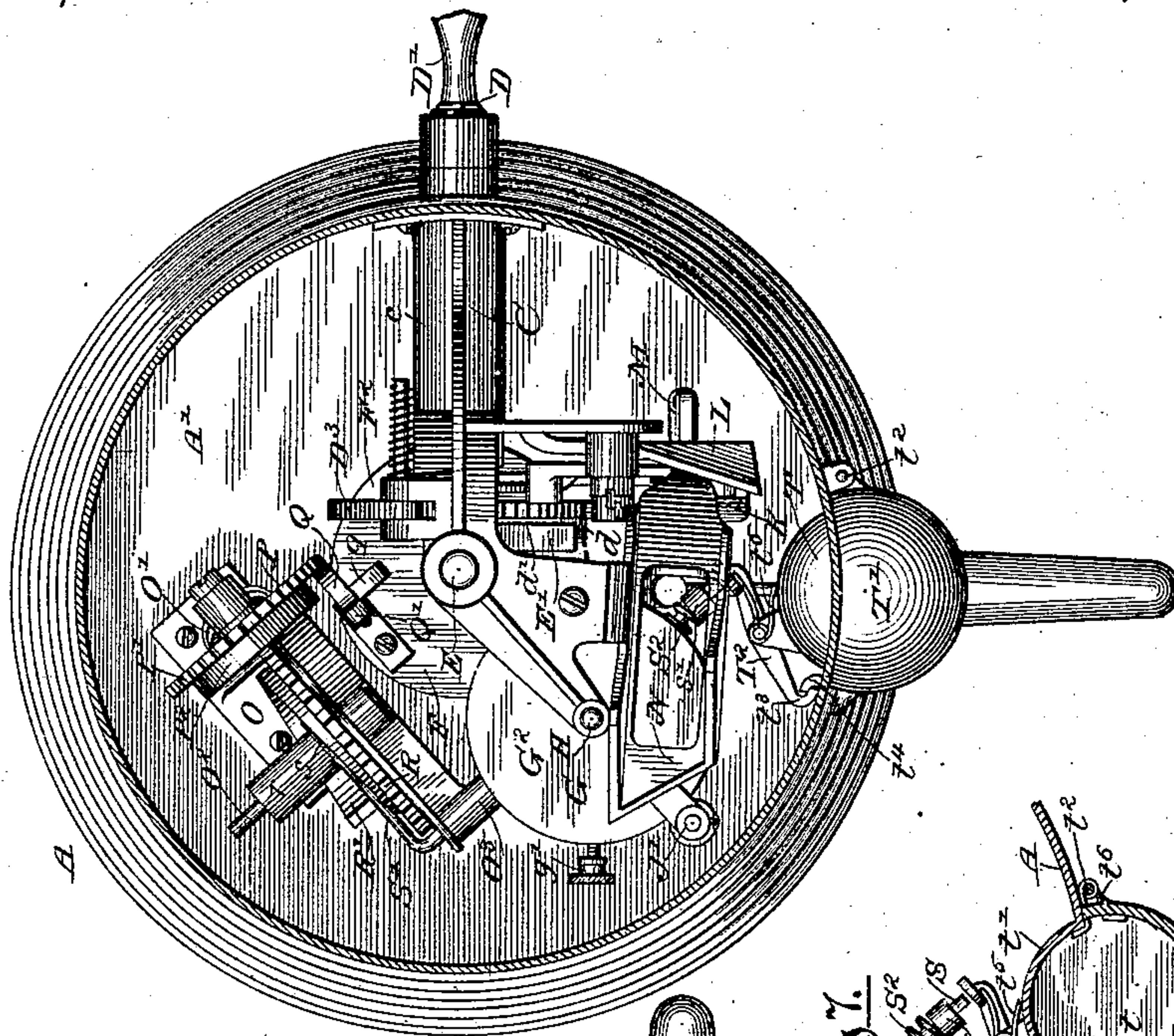


Fig. 1.

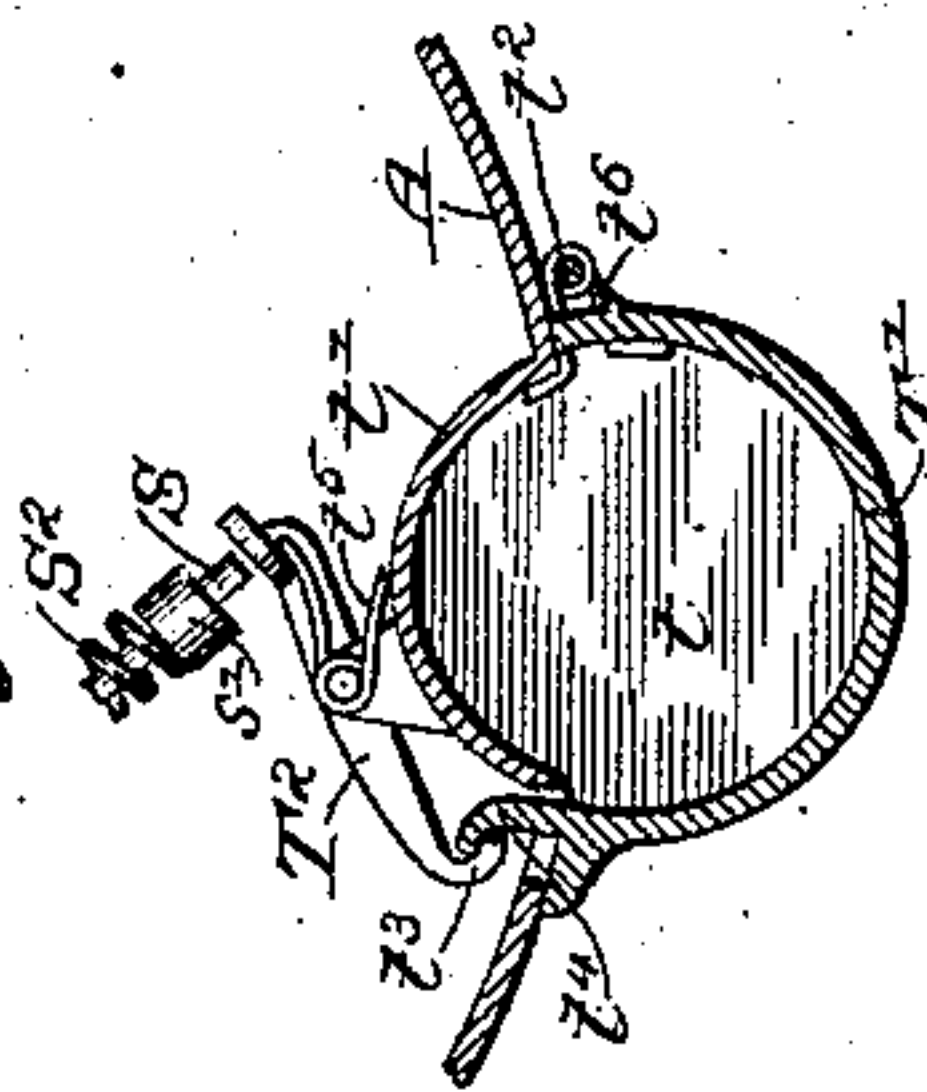
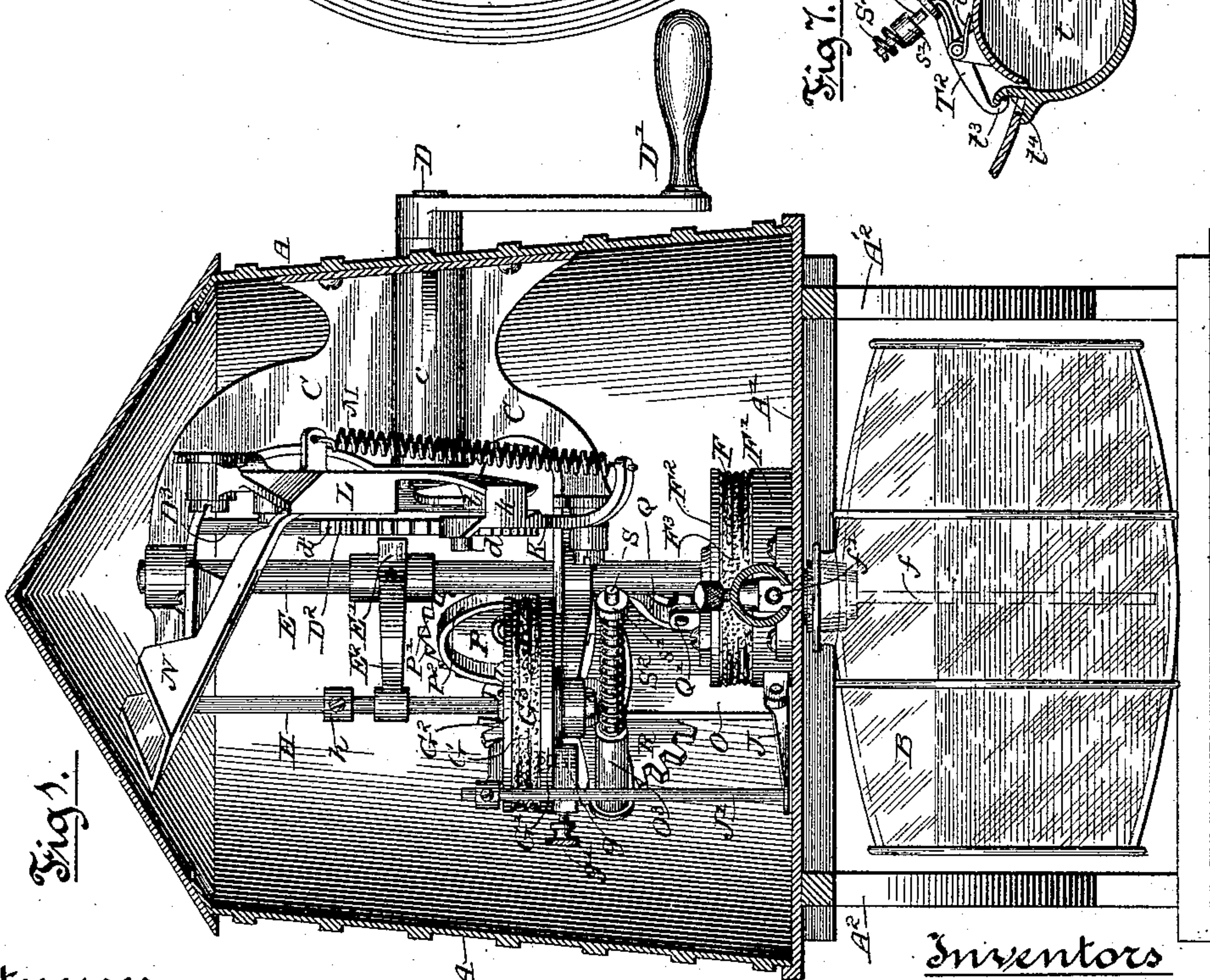


Fig. 1.



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Fig 3.

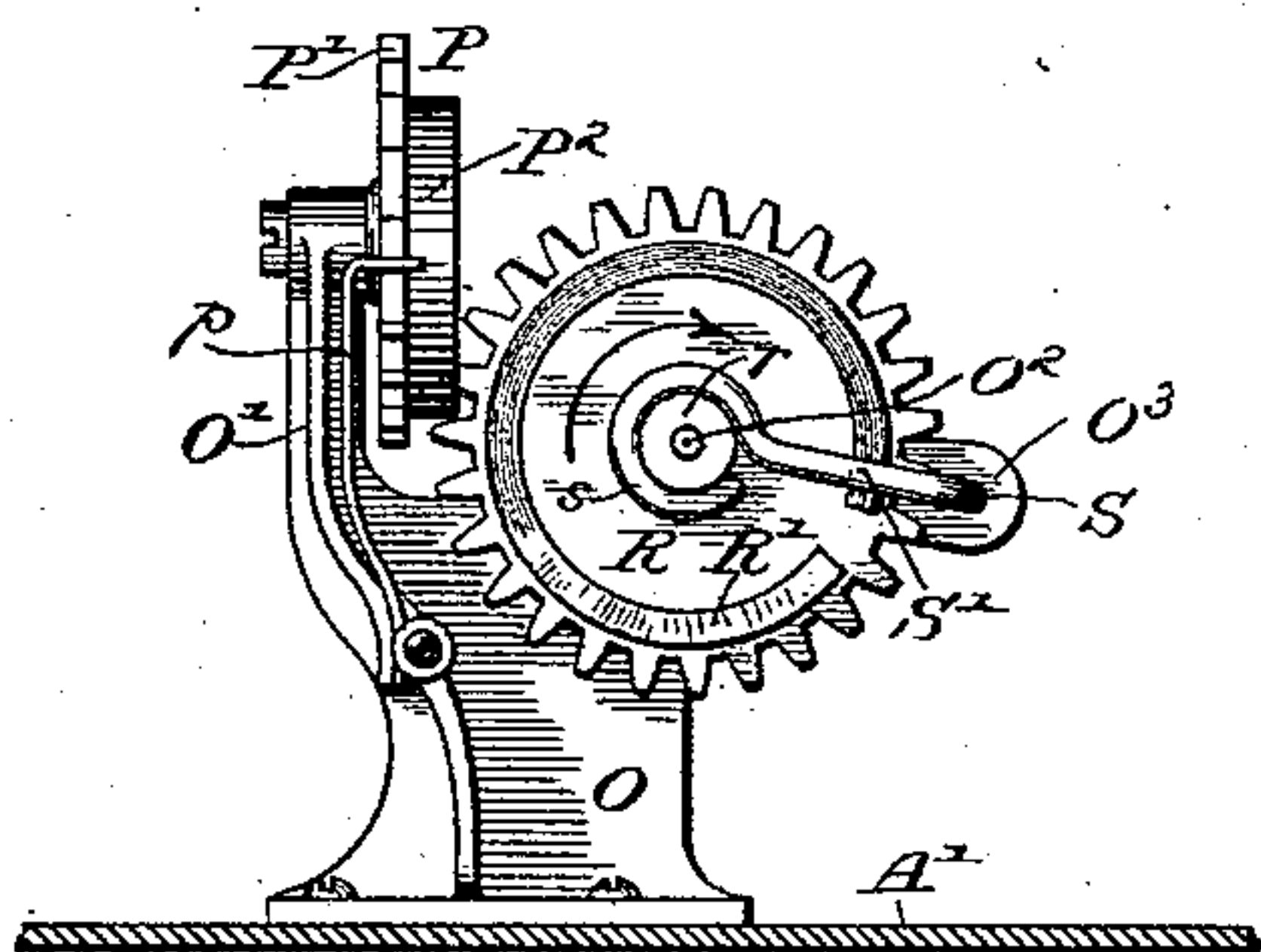


Fig 4.

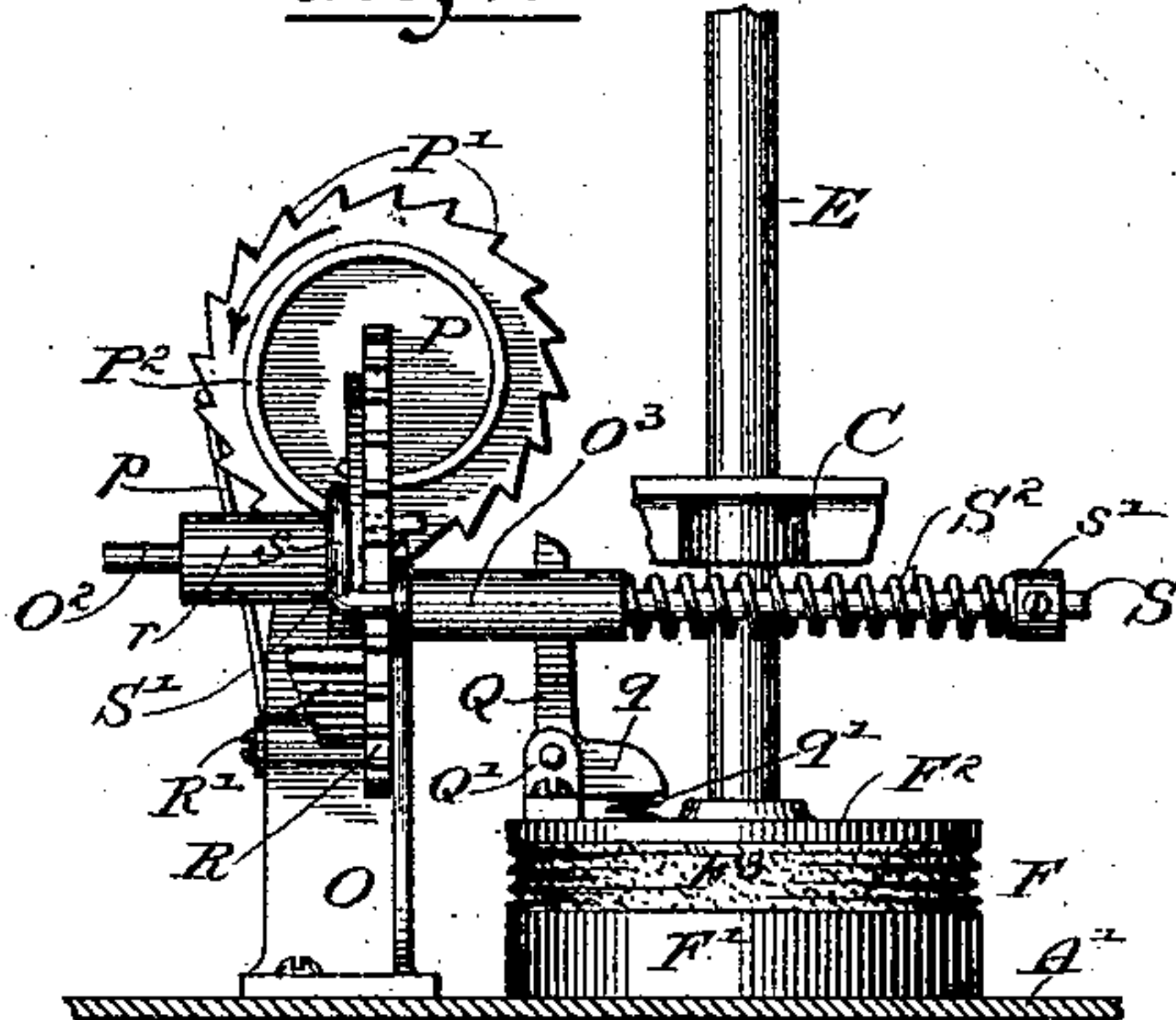


Fig 5.

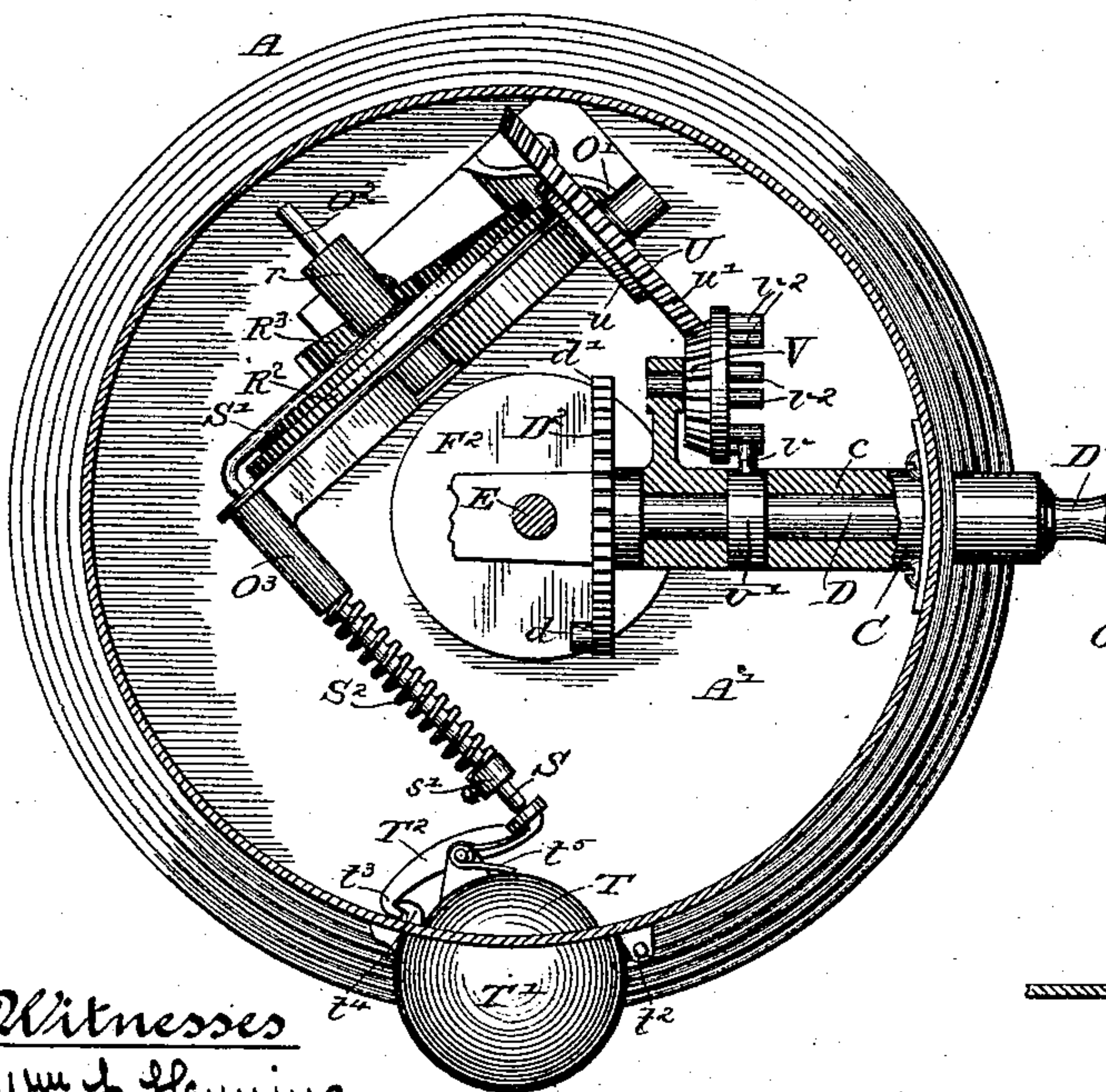
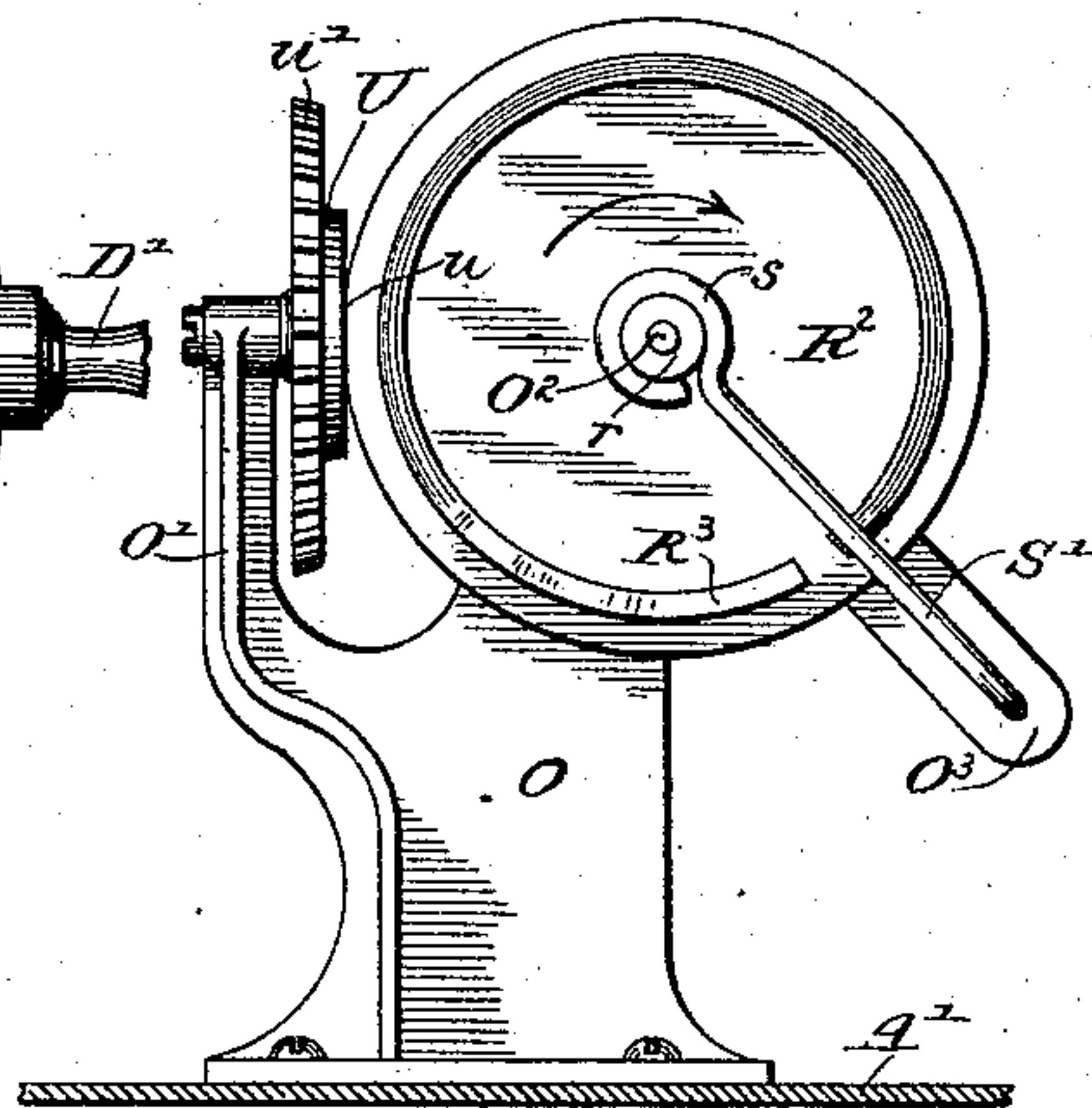


Fig 6.



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(No Model.)

3 Sheets—Sheet 3.

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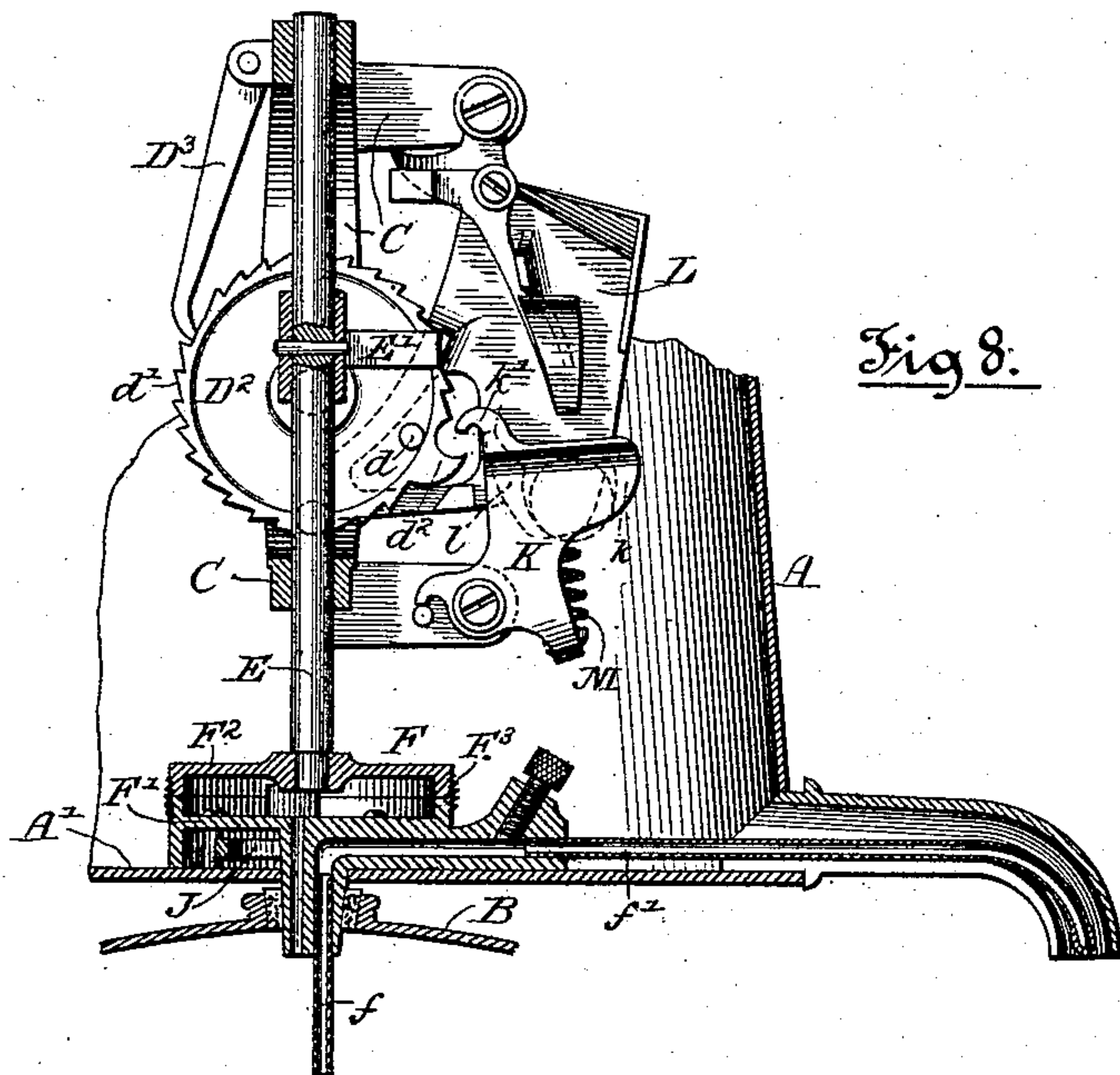


Fig 8.

Fig 9.

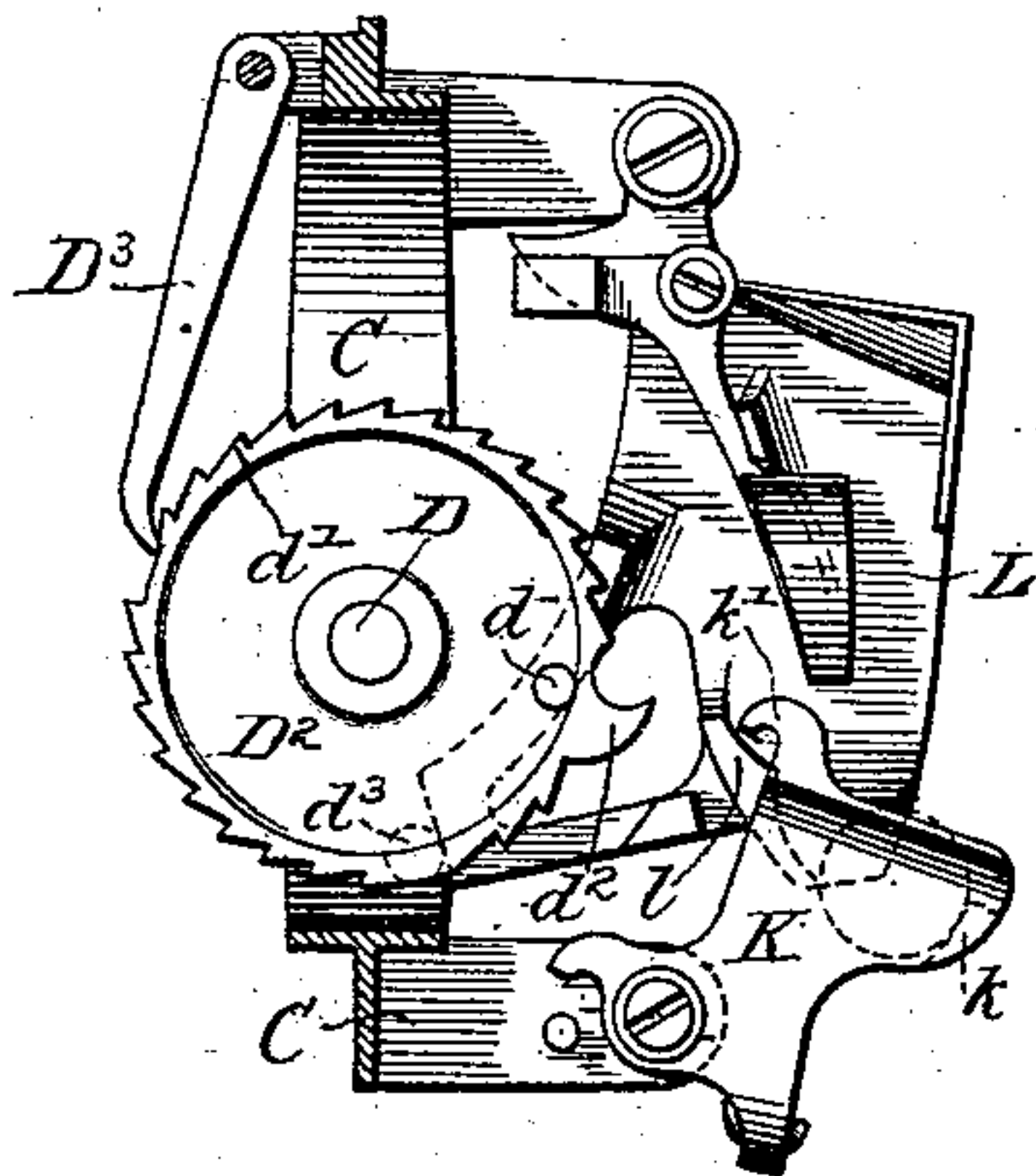
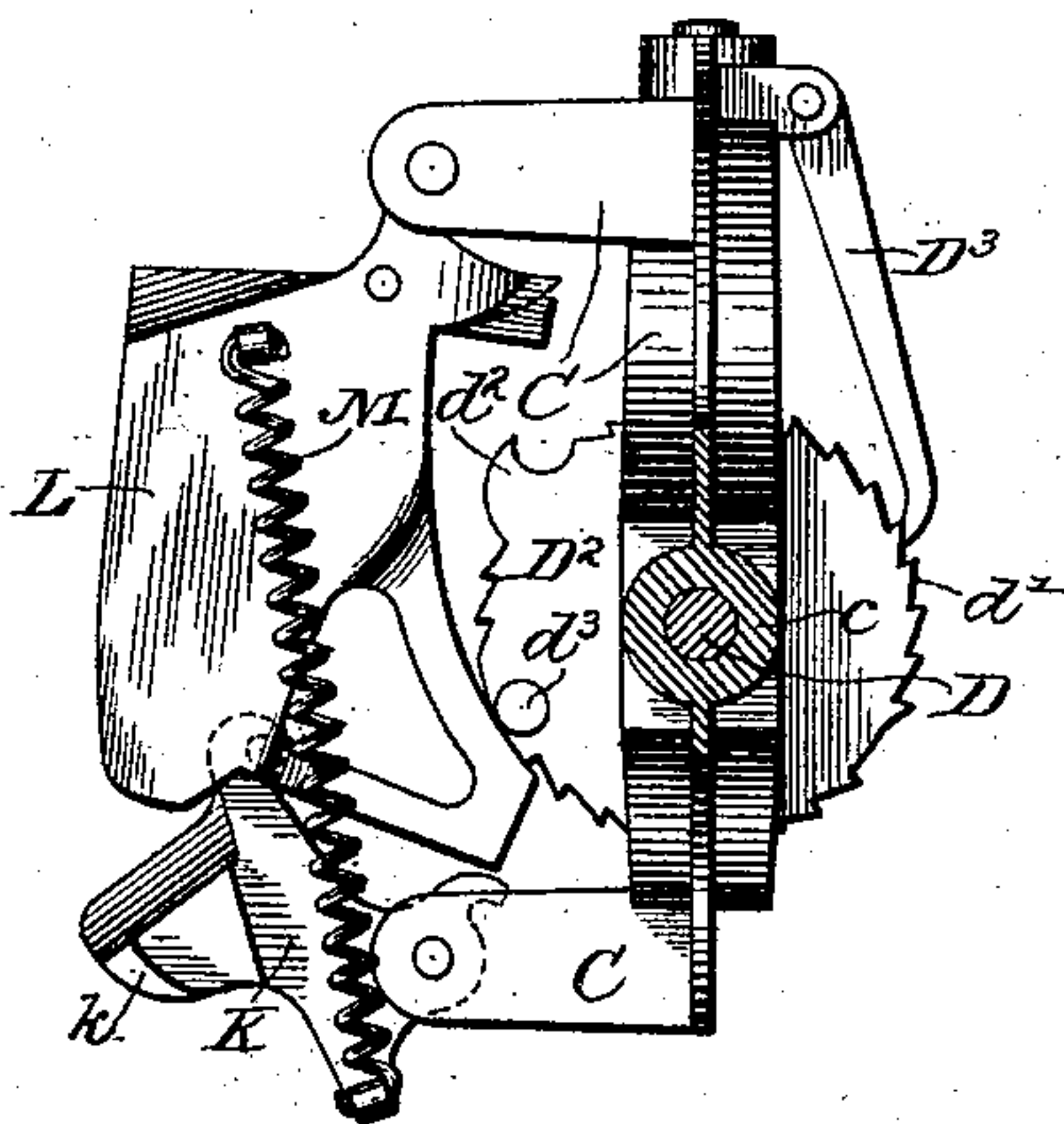


Fig 10.



Witnesses

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# UNITED STATES PATENT OFFICE.

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HILL ASSIGNOR TO SAID BACON.

## COIN-ACTUATED DEVICE FOR VENDING OR OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 471,712, dated March 29, 1892.

Application filed June 28, 1890. Renewed November 18, 1891. Serial No. 412,323. (No model.)

*To all whom it may concern:*

Be it known that we, DANIEL H. BACON and CHRISTIAN C. HILL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Coin-Actuated Devices for Vending or other Purposes; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of apparatus for vending or other purposes which are held from operation by devices which can only be released by the insertion of a coin into the apparatus, and more especially to improvements in such apparatus by which after the same has been actuated a number of times a part of the machine or apparatus will be moved or actuated to release or discharge an article or to accomplish some other movement not usually produced in the ordinary operation of the machine.

The apparatus illustrated in the accompanying drawings is a vending device for liquids, and the devices herein shown, in connection with said vending device to illustrate my invention, are adapted to release the door or cover of a receptacle in which may be placed an article of merchandise, which will by the release of said door be accessible to the person who has deposited a coin prior to the movement of the apparatus by which the door is released. As far as these parts of the machine which are actuated or controlled by the coin are concerned, any form of the same may be employed in connection with our invention, which relates solely to devices by which some additional movement is accomplished after the machine has been actuated a number of times in the ordinary manner by the insertion of a coin.

In the accompanying drawings, illustrating our invention, Figure 1 is a central vertical section through the external casing of an apparatus embodying the same, showing the main operative parts in side view. Fig. 2 is a plan view of the same with the top of the casing removed. Fig. 3 is a sectional elevation showing the parts more directly relating

to this invention. Fig. 4 is a view in side elevation of the parts shown in Fig. 3 as seen from the right-hand side of said figure. Fig. 5 is a sectional plan view of the casing of the apparatus and parts therein, showing a somewhat different form of apparatus embracing the main features of our invention. Fig. 6 is a detail sectional elevation of a portion of the same. Fig. 7 is a detail sectional plan view. Figs. 8, 9, and 10 are separate views in elevation of parts of the operating mechanism.

As shown in said drawings, A indicates the external casing or housing of the machine, which in the instance illustrated constitutes, also, a part of the frame thereof, said housing for this purpose preferably being made of cast metal.

A' indicates a horizontal base-plate, which supports the housing and to which certain parts of the apparatus are attached. Said base-plate is herein shown as sustained by means of posts or standards A<sup>2</sup> A<sup>2</sup> above a table or other support upon which the apparatus may be placed, space being afforded beneath the base-plate A' between said posts for a tank or receptacle B, which contains the liquid which the machine illustrated is intended to deliver upon the insertion of a coin.

C is an arm or bracket attached to the inner surface of the housing A and containing the bearing c for a shaft D, which is arranged horizontally and extends from the interior of the casing outwardly through the side of the same. Said shaft is provided at its outer end with a crank D', by which said shaft may be turned to operate the machine.

D<sup>2</sup> is a flat wheel or disk, through the medium of which the several operative parts of the device are actuated.

E is a vertical rod arranged adjacent to the disk D<sup>2</sup> and having bearings at its upper and lower ends in the bracket C. Said rod E is provided at its side adjacent to the disk D<sup>2</sup> with a transverse bar or cross-piece E', arranged horizontally near the face of the disk and parallel thereto, said bar being adapted for engagement with a stud or crank-pin d upon the inner face of the disk in such manner that said rod or shaft will be lifted by the action of said pin or stud upon said bar when the disk is revolved.



F is an expansible air-chamber located upon the base-plate A' and having a lower stationary wall F', an upper movable wall F<sup>2</sup>, which is connected with the rod E, and a connecting flexible wall F<sup>3</sup>. Said air-chamber F is in communication with the interior of the tank B, and a tube *f* leads from a point near the bottom of the tank upwardly through the top of the same and is connected with a horizontal tube *f'*, which extends to one side of the casing and is open at its outer end for the discharge of liquid therefrom.

G is a second expansible air-chamber consisting of a stationary bottom plate G', a vertically-movable top plate G<sup>2</sup>, and a flexible wall G<sup>3</sup>. The lower plate G' is attached to the lower part of the bracket C, and the top plate G<sup>2</sup> is attached to a vertical rod H, which is guided at its upper end by and is adapted to slide in the upper part of said bracket C. Said chamber G is provided with a check-valve *g* and a small air-passage, the size of which is controlled by a set-screw *g'*. Upon the said rod H is located a ring or collar *h*, forming a stop, and attached to the rod E is a rigid arm E<sup>2</sup>, adapted for contact with said stop when said rod E is moved upwardly, the parts being so arranged that the rod H will be lifted in the upward movement of the rod E, while the latter, together with the top plate F<sup>2</sup> of the air-chamber F, is free to descend independently of the said rod and the top plate G<sup>2</sup> of the air-chamber G. The said air-chamber F is provided with an inwardly-opening air-valve controlled by a lever J, which lever is actuated to open the said air-valve by means of a rod J', attached to the top plate G<sup>2</sup> of the air-chamber G when said top plate descends.

The operation of the parts above described in delivering liquid from the tank B is as follows: The parts stand normally in position with the air-chambers F and G contracted and the rods E and H at the lower limit of their movement. When the shaft D is turned, the said rod E will be lifted, thereby expanding the air-chambers F and G. After the said rod E has been released by the further turning of the shaft the descent of the top plate F<sup>2</sup> under its own weight and that of the rod E will operate to force air out of the said air-chamber into the tank B, thereby compressing the air over the liquid therein and forcing the same outwardly through the discharge-tube *f'*. During the descent of the top plate F<sup>2</sup> the air will be prevented from escaping from the air-chamber F otherwise than into the tank by means of the air-valve, which is controlled by the lever J, which air-valve at this time will be closed. As soon as the rod E begins to descend, the rod H, which sustains the top plate G<sup>2</sup> of the air-chamber G, will also be free to descend; but the descent of said top plate G<sup>2</sup> will be limited or controlled by the escape of air through the small air-exit passage of said air-chamber G, so that said top plate G<sup>2</sup> will descend slowly. When said top plate has reached the lowermost limit of its

movement, the rod J' will strike and actuate the lever J, thereby opening the air-valve of the air-chamber F and allowing the escape of air directly from the said chamber F, so that any further forcing of air into the tank will immediately cease. The outflow of liquid from the tank will therefore be of greater or less duration, according to the time required for the top plate G<sup>2</sup> of the air-chamber to descend, as fully set forth in said separate application filed simultaneously herewith.

Devices are provided for holding the shaft D from being turned, except when a coin is inserted into the machine, as follows:

K is a swinging detent pivotally supported at its lower end upon the bracket C and arranged to swing in a plane parallel with the disk D<sup>2</sup>. Said detent is provided with an arm or lug *k'*, adapted to engage a projection *d'* upon the disk D<sup>2</sup> in such manner as to hold said disk from rotation.

L is a swinging plate arranged to move in a plane parallel with the disk D<sup>2</sup> and pivoted at its upper part to the bracket C. Said plate L is adapted for actuation by means of a stud *d'* on the rear or outer face of the disk D<sup>2</sup>, which is arranged to act upon the inner edge of said plate and which operates to throw or carry the said plate away from the center of the disk. A coiled spring M is connected with lugs or projections upon the said detent K and plate L and operates to throw the detent into position to engage and hold from movement the disk D<sup>2</sup> and also to throw the plate L against the actuating-stud *d'* on the said disk. The said plate and detent are arranged to overlap each other and are provided with opposing flanges or projections *k l*, these parts being so arranged that a coin may be placed between the plate and detent with its edges in contact with said flanges or projections *k l*. When no coin is present between the flanges *k l*, said plate L is free to move outwardly under the action of the stud *d'* on the disk D<sup>2</sup> without moving or shifting the detent; but when a coin is inserted between said flanges *k l* the outward movement of the said plate L will actuate the detent K through the medium of the coin, and thus release said detent from the disk D<sup>2</sup> and allow the same to be turned by the actuation of the other parts of the apparatus, as fully set forth in said separate application hereinbefore referred to. This construction is illustrated more particularly in Figs. 8, 9, and 10.

N is an inclined guideway or chute located at the upper part of the apparatus and adapted to receive a coin from a slot in the top wall of the casing and to deliver the same into position between the flanges *k l*, as fully described in said separate application.

D<sup>3</sup> indicates a pawl, which acts upon ratchet-teeth *d'* on the disk D<sup>2</sup> to hold the latter from backward movement.

O is a standard attached to the base-plate A'. Said standard has an arm O', upon the upper end of which is mounted a revolving



wheel or disk P. Said disk is provided with peripheral ratchet-teeth  $P'$ , which are engaged by one end of a spring-pawl  $p$ , which acts to prevent the wheel from turning backward.

Q is a spring-pawl mounted upon and moving with the top plate  $F^2$  of the air-chamber F and acting upon the ratchet-teeth  $P'$  of the disk P to turn said disk through a short distance at each reciprocation of the said top plate. The spring-pawl Q in the particular construction illustrated is pivoted in a bracket  $Q'$  on the top plate  $F^2$ , and has a horizontal arm  $q$ , against which acts a spring  $q'$ , tending to throw the pawl toward the disk P.

R is a cog-wheel, which is mounted on a horizontal shaft  $O^2$ , attached to the standard O, said wheel being located in a plane at right angles to the plane of the disk P, which latter is provided on its face with a spiral rib  $P^2$ , adapted to engage the cogs of the wheel R, so that said wheel R will receive a slow rotary motion when the disk P is turned.

S is a horizontally-arranged sliding rod mounted in a stationary tubular guide  $O^3$  on the standard O, said rod being arranged parallel with the axis of the wheel R and having an arm  $S'$  extended inwardly parallel with the face of the said wheel R toward the center of said wheel and having on its inner end a ring  $s$ , which slides upon and is guided by a hub or tubular projection  $r$  on the wheel R. Said wheel is further provided with a cam projection or rib  $R'$ , which acts upon the arm  $S'$  of the rod S to move the latter endwise when the said wheel is turned. A spring  $S^2$ , surrounding the rod S and acting on a shoulder or collar  $s'$  on said rod, serves to hold the arm  $S'$  of the rod in contact with the cam-rib  $R'$ . It follows from the construction described that each time the wheel R makes a complete rotation the rod S will be drawn backwardly against the action of the spring  $S^2$  and will be released and allowed to resume its extended or advanced position.

T indicates as a whole a box or receptacle having a door or cover  $T'$ , the receptacle being herein shown as having a flat bottom  $t$  and an inner concave wall  $t'$  formed on the casing A, and the cover  $T'$  as being of convex shape and as forming the outer and top part of said receptacle. Said cover  $T'$  is shown as hinged at one side to the casing A by a hinge  $t^2$ .

$T^2$  is a spring-catch located inside of the casing A and having a hooked end  $t^3$ , which engages a hooked lug  $t^4$  on the free edge of the cover  $T'$  and which extends inwardly through a hole in the casing A. The catch  $T^2$  consists of a lever pivoted between its ends and arranged with its end opposite that which engages the lug  $t^4$  in position for contact with the rod S when the latter is in its extended position. A spring  $t^5$  acts to throw the hook  $t^3$  of the catch into position to interlock with the lug  $t^4$ , and a spring  $t^6$  is applied to throw open the door  $T'$  when the catch  $T^2$  is re-

leased from the lug  $t^4$  on the door. The cam-rib  $R'$  of the wheel R is arranged to hold the rod S free from the catch  $T^2$  in all parts of its rotation, except at one point, where the said flange is either omitted entirely or made so low as to allow the rod S to act upon the said catch and release the same from the lug  $t^4$ , thereby releasing the door or cover  $T'$  and leaving the same free to be opened.

In the operation of the parts above described it is obvious that the door or cover  $T'$  will be released or allowed to open only after the main parts of the apparatus have been actuated to discharge a quantity of liquid a number of times, so that such door or cover will in the operation of the apparatus thus constructed be opened or allowed to open at infrequent intervals. In other words, it is necessary that a coin should be inserted to accomplish the release of the detent which holds the main parts from movement and that said parts should be moved a number of times before said door or cover is released or allowed to open. The number of movements of the principal parts of the apparatus by which the vending is accomplished before the door or cover  $T'$  will open depends upon the diameter of or the number of ratchet-teeth upon the disk P, and also upon the number of teeth with which the wheel or disk R is provided, it being obvious that by varying the construction of the parts in the particulars referred to, or by varying the number of such wheels or disks, or by providing the cam-rib  $R'$  with more than one notch, the actuation of the said door or cover may be arranged to take place at any desired interval or after any desired number of movements of the main parts of the apparatus—as, for instance, if the wheel or disk R is arranged to make one complete rotation during six hundred rotations of the main actuating-shaft D, then the door or cover  $T'$  will be released after the insertion of six hundred coins in the apparatus and the same has been actuated six hundred times.

In the particular device above described, and shown in Figs. 1 to 4, the opening of the cover or door  $T'$  is positively controlled by the movements of the other parts of the apparatus, so that the said door or cover will invariably be released after the main parts have been actuated a certain number of times. If desired, however, the parts may be so constructed in carrying out the principal features of our invention as to make the time of opening or releasing the door or cover indefinite or indeterminate, or, in other words, to make such time of opening to some extent independent of the number of times the main parts of the vending device have been actuated. This we accomplish, preferably, by the introduction of a frictional driving device in the connecting mechanism by which motion is transmitted from the moving parts of the vending device to the door or cover or the parts which hold the same closed, such



frictional driving device being adapted to slip or yield to a greater or less or indeterminate extent.

A construction of the kind last above referred to is shown in Figs. 5 and 6. In this instance a revolving disk  $R^2$  is employed, which is provided with a cam-shaped flange or rib  $R^3$ , operating on a sliding rod  $S$  in the same manner as hereinbefore described in connection with the corresponding parts shown in Figs. 1 to 4. In this instance, however, the disk  $R$ , instead of being provided with cogs or teeth, has a smooth peripheral surface which is adapted to frictionally engage the flat face  $u$  of a disk  $U$ , which is driven or turned from the shaft  $D$ . Said disk  $U$  may be actuated in the same manner as is the disk  $P$ , (shown in Figs. 3 and 4;) but as herein illustrated in Figs. 5 and 6 said disk is provided with peripheral cogs or teeth  $u'$ , which engage with a beveled gear-wheel  $V$ , which gear-wheel is actuated by means of a single revolving spur or tooth  $v$ , affixed in a collar  $v'$  on the shaft  $D$  and engaging a series of studs or pins  $v^2 v^2$  on the said gear-wheel  $V$ . In the operation of the device thus constructed the gear-wheel  $V$  will be turned a small angular distance at each rotation of the shaft  $D$ , and the intermittent motion thus given to the said gear-wheel will be transmitted to the disk  $U$ , which latter being larger than said gear-wheel  $V$  will turn more slowly than the latter. The disk  $R$  in this instance is shown as being made considerably larger than the disk  $U$  and as engaging the surface  $u$  of the same at a point near the center of the disk, so that said disk  $R$  is turned much more slowly than the disk  $U$ . The said disk  $R$  will be held against the disk  $U$  with a slight pressure, so that the motion transmitted will not be positive, but will be variable by reason of the occasional slipping of said disk  $R$  on the friction-surface of the disk  $U$ . It follows from this construction that the time of release of the door or cover  $T'$  cannot be definitely ascertained beforehand, but will occur sooner or later, according to the amount of lost motion occurring by reason of the slipping of the parts in frictional engagement, as above set forth.

While the particular devices illustrated for communicating motion from the main parts of the vending apparatus to the door or cover  $T'$  embrace novel features of construction forming part of the present invention, yet it is to be understood that the invention also includes, broadly, any kind of mechanism actuated by or from the main operative parts of the vending apparatus and acting to release the door or cover, such devices embracing a worm-gear, a train of cog-wheels, or other device, by which the door is moved or released only after a number of separate movements of the vending devices. It is obvious, furthermore, that the novel features of construction constituting the general features of our invention may be employed in

connection with some part which it is desired to shift or move at infrequent intervals other than a door or cover—as, for, instance, the part to be shifted or moved may be a part which is simply made visible or brought into view instead of one which is released or opened to permit access to a receptacle or the escape of some object or article from a receptacle. It is to be further understood that the liquid-vending device herein illustrated is only shown for the purpose of making clear the operation of the invention, and that any other vending device or any other kind of apparatus which is adapted for actuation by or after the insertion of a coin may be employed in connection with the novel features herein shown, and when so employed will embrace the broad features of construction constituting our invention.

We claim as our invention—

1. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which is moved or shifted to allow the actuation of the main parts by the presence of a coin, of an adjunctive apparatus distinct from the vending apparatus and consisting of a door or cover which it is desired to infrequently move or release, and mechanism connected with the main operative parts of the vending apparatus, constructed for operation only by repeated movements or operations of said main parts of the vending apparatus and constructed to move or release said door or cover after said detent has been moved or shifted and the main parts actuated a plurality of times, substantially as described.

2. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which is moved or shifted to allow the actuation of the main parts by the presence of a coin, of a door or cover which it is desired to infrequently move or release, and a speed-reducing device actuated by one of the moving parts of the apparatus and acting to move or release said door or cover, substantially as described.

3. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which is moved or shifted to allow the actuation of the said main parts by the presence of a coin, of an adjunctive apparatus distinct from the vending apparatus and consisting of a receptacle provided with a door or cover, a catch holding said door or cover closed, and mechanism actuated by one of said main parts and acting upon said catch to release the said door or cover, substantially as described.

4. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which is moved or shifted to allow the actuation of the said main parts by



the presence of a coin, of an adjunctive device distinct from the vending apparatus and consisting of a receptacle provided with a door or cover, a catch for holding the said door or cover closed, a spring for retaining the catch engaged with the door or cover, and mechanism connected with and actuated by the main parts of the apparatus and acting upon said catch in opposition to the spring, substantially as described.

5. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which is adapted to be moved or shifted to allow the actuation of the main parts by the presence of a coin, of an adjunctive apparatus distinct from the vending apparatus and consisting of a receptacle provided with a door or cover, a catch for holding said door or cover closed, a spring tending to open the door or cover, and mechanism connected with and actuated by the main parts of the apparatus and constructed to actuate said detent for releasing the door after a plurality of movements of the said main parts of the vending apparatus, substantially as described.

6. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts from movement and which may be moved or shifted to allow the actuation of the said main parts only when a coin is present, of a door or cover

which it is desired to infrequently move or release, and mechanism connected with and actuated by the main parts of the apparatus and comprising a revolving disk or wheel provided with a cam-shaped part or flange, and a spring-actuated rod engaged with said cam-shaped part or flange and acting upon said door or cover which it is desired to move or release to accomplish the movement or release of said door or cover, substantially as described.

7. The combination, with a vending apparatus embracing a detent or holding device which normally holds the main parts of the apparatus from movement and which may be moved or shifted to allow the actuation of the said main parts only when a coin is present, of a door or cover which it is desired to infrequently move or release, and mechanism embracing a frictional driving device connected with and actuated by the said main parts of the apparatus and constructed to engage and actuate the said door or cover which it is desired to infrequently move or release, substantially as described.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

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CHRISTIAN C. HILL.

Witnesses:

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