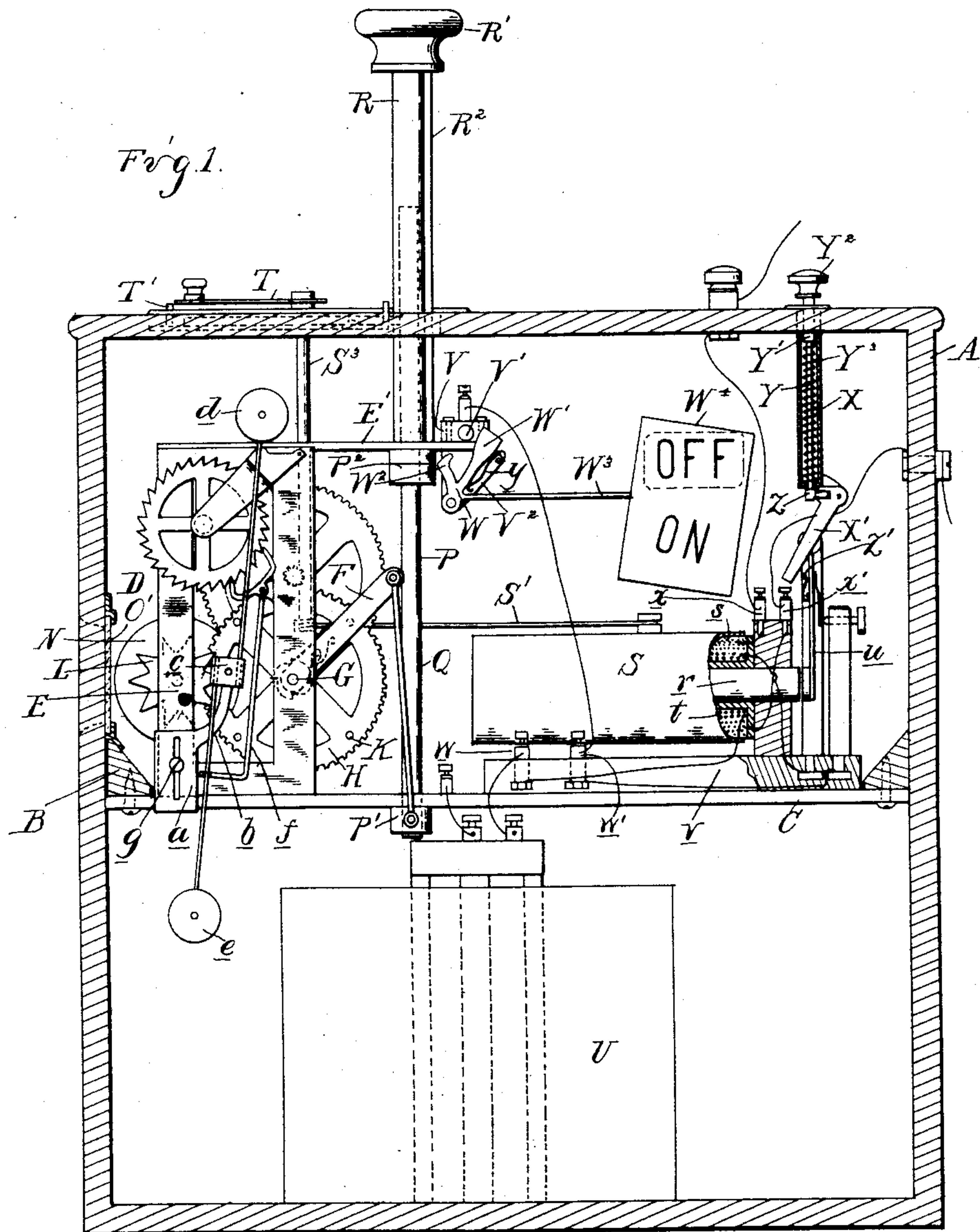


2 Sheets—Sheet 1.

No. 542,471.

Patented July 9, 1895.



Witnesses

Witnesses  
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2 Sheets—Sheet 2.

No. 542,471.

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Fvg. 2.

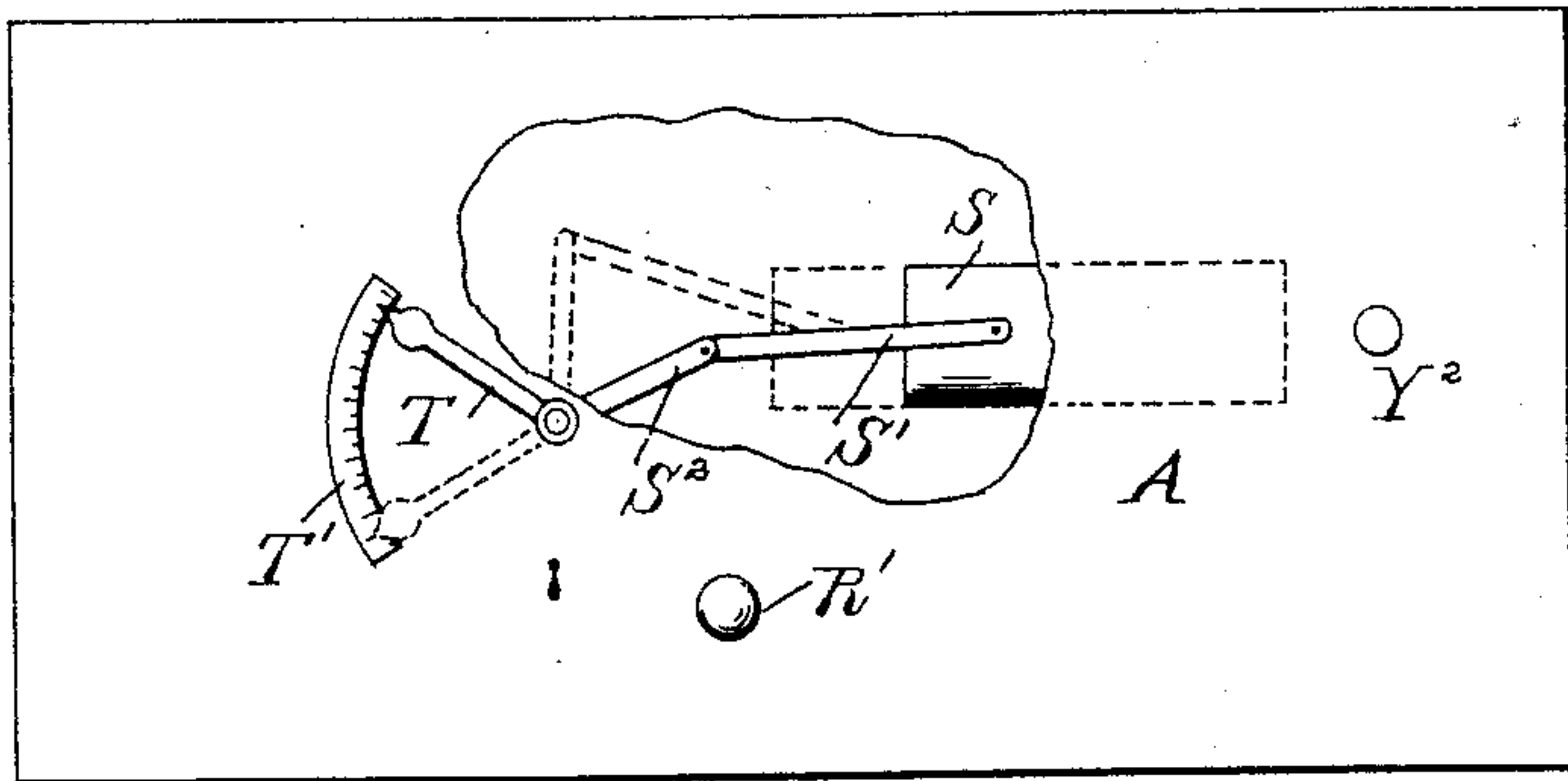


Fig. 4.

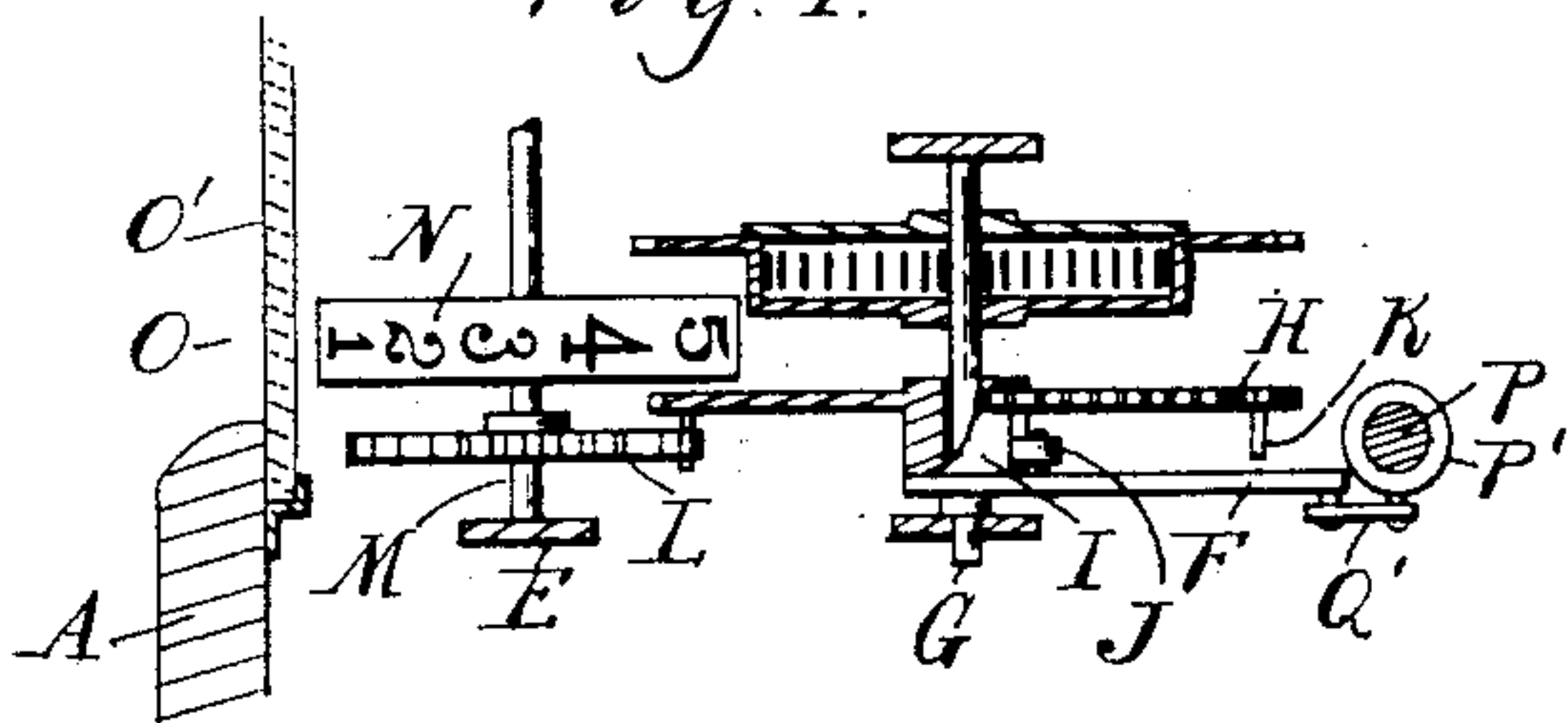


Fig. 3.

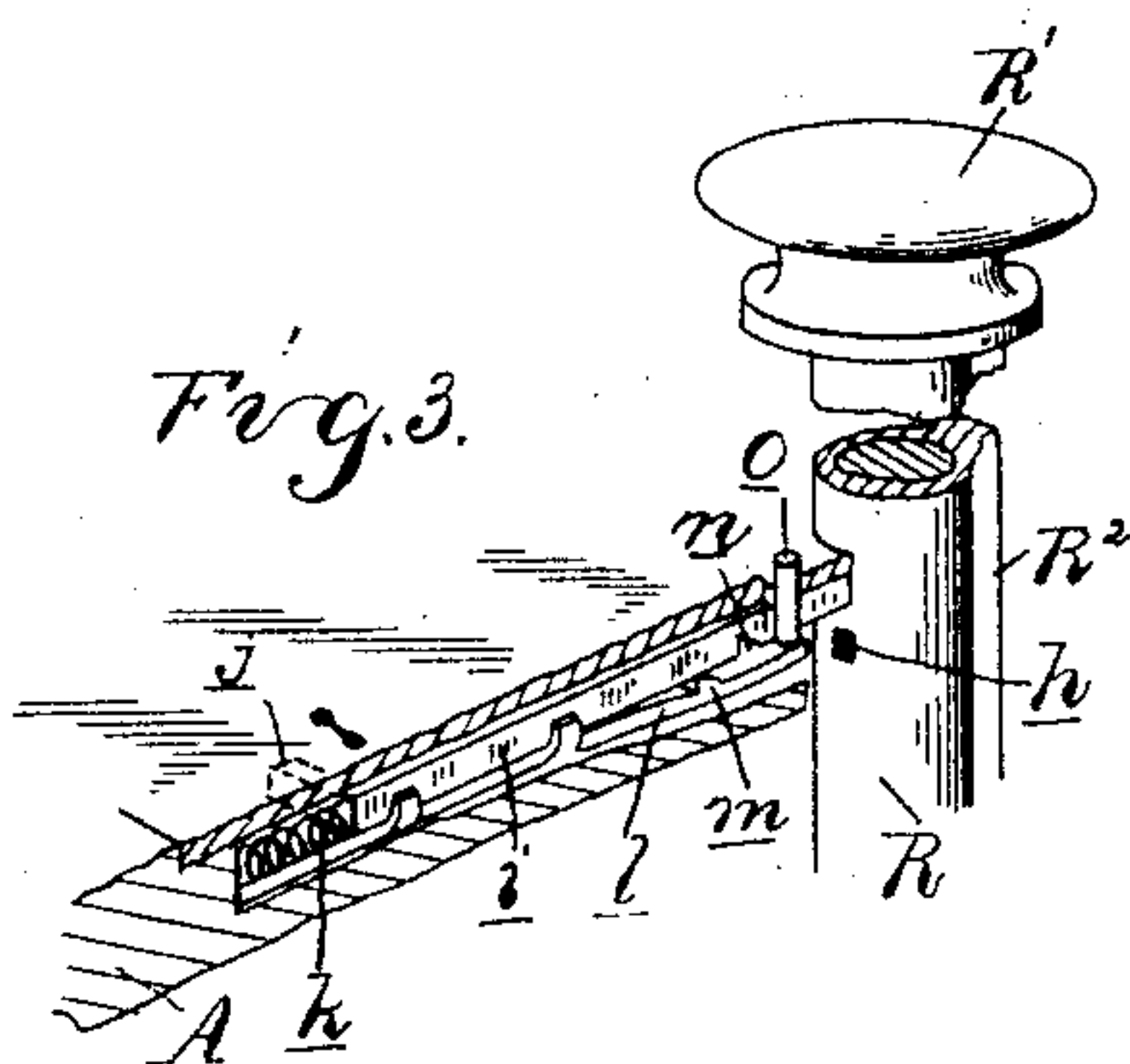


Fig. 5.

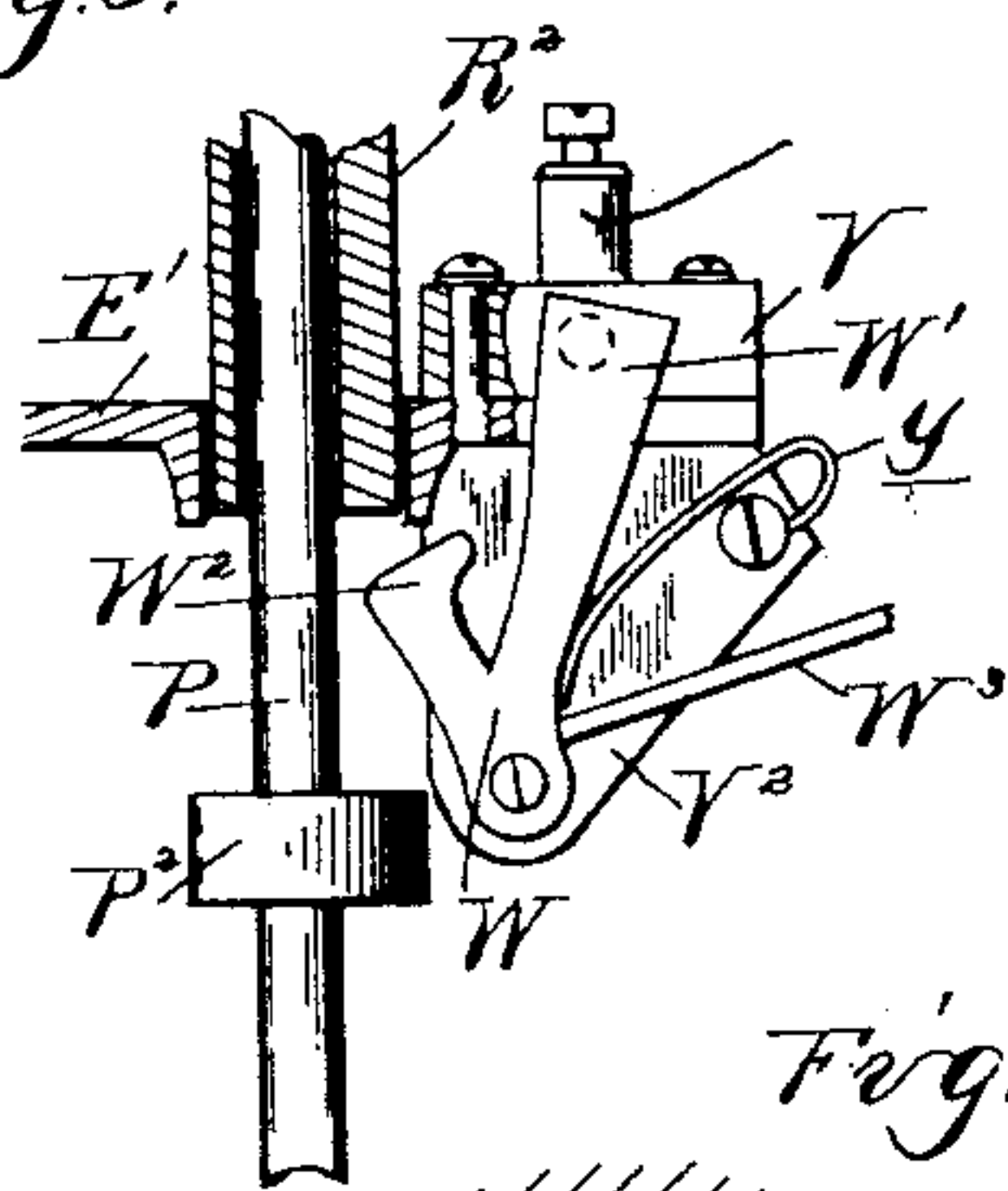


Fig. 6.

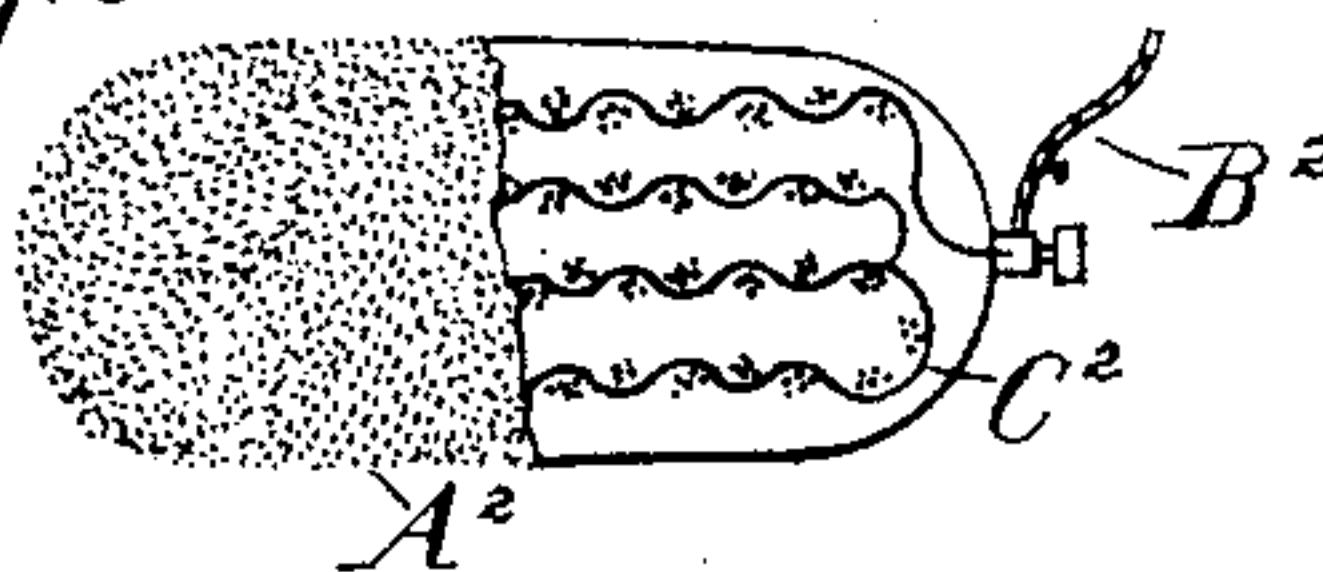


Fig. 7.

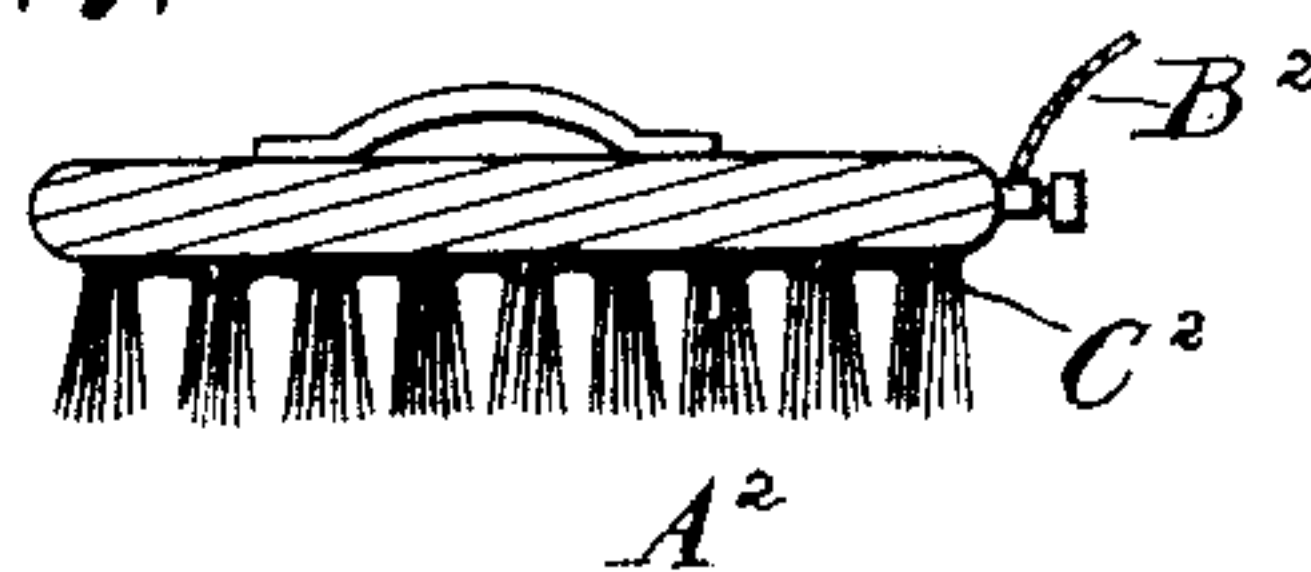
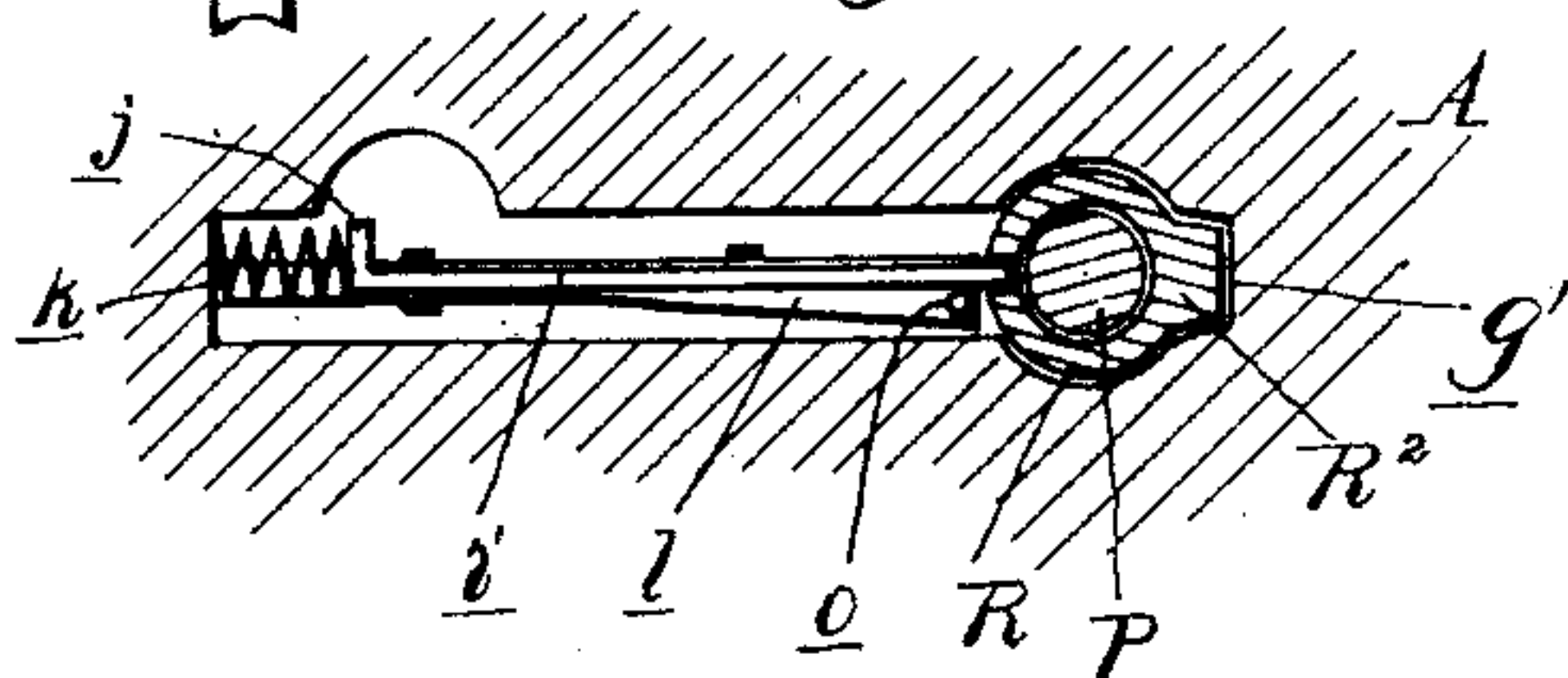


Fig. 8.



Witnesses

Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM E. GOLDEN, OF AUBURNDALE, OHIO.

## ELECTRIC-BATH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 542,471, dated July 9, 1895.

Application filed March 5, 1895. Serial No. 540,588. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. GOLDEN, a citizen of the United States, residing at Auburndale, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Electric Bath Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to that class of electrical apparatus embodying a construction whereby any ordinary bath may be readily converted into an electric bath, comprising means to register the number of times and to automatically control the duration of the period during which the bath may be used.

To this end my invention consists, briefly, in an apparatus comprising an electric generator, an induction-coil, the terminals of the secondary of which are connected, respectively, to the tub and brush, together with registering mechanism operating in connection with the generator and coils.

The invention further consists in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described and shown.

In the drawings, Figure 1 is a vertical central section through the casing, showing the location and arrangement of the various parts comprising my invention. Fig. 2 is a top plan view thereof, partially broken away, showing the construction of the regulating mechanism. Fig. 3 is a detail perspective view of the locking mechanism for the casing. Fig. 4 is a plan view of the registering mechanism. Fig. 5 is an elevation of the automatic breaking and closing device for the circuit. Fig. 6 is a bottom plan view of the brush, illustrating the manner in which connection is made between it and one of the terminals of the secondary coil. Fig. 7 is a side elevation thereof, and Fig. 8 is a horizontal section through a portion of the top of the casing.

A represents the casing, made preferably of wood and suitably ornamented.

Midway of the top and bottom of the box or casing and extending from the sides thereof are strips or bars B, to the under faces of which is secured the partition C, dividing the casing into an upper and lower compartment adapted to receive, respectively, the register-

ing mechanism, induction-coil, &c., and the battery.

The clock mechanism, referring to Fig. 1, comprises an ordinary clockwork D, having the usual escapement. In the present case the pendulum is modified to something of a swinging balance, the object of the modification being to provide an instrument which will not require swinging off to start. This balance consists of a slotted plate *a*, having the inclined and upwardly-extending arm *b*. To the upper end of this arm is pivoted a plate *c*, which carries the weighted lever-arms *d* and *e*, the latter arm engaging with the stem *f* of the escapement. The plate *a* is adjustably secured to the frame E of the clockwork by the clamping-screw *g*. By this construction the movement of the clockwork may be regulated to a nicety.

F is a rock-arm secured to the main spindle or shaft G of the clockwork, and H is a gear-wheel loosely sleeved to said shaft. Between the arm and the gear-wheel and integral with the latter is the hub I, which is divided into a ratchet of four teeth at equal distances from each other adapted to engage with a pawl J on the rock-arm F.

Near the periphery of the wheel H, at equal distances from the center and from each other, are lugs or pins K, preferably four in number, which are adapted to engage with the teeth of a star-wheel L on the spindle M, which has suitable bearings in frame E.

N is a registering-wheel, adjacent to and on the same spindle with the wheel L, these two wheels being so located in the casing as to be opposite an aperture O in said casing, as fully shown in Fig. 4.

O' is a transparent disk, preferably of glass, secured to the casing and closing the aperture O, thus preventing dust or dirt from entering and clogging said mechanism, and at the same time affording means for reading the registering device without opening the casing.

P is a vertical reciprocating rod passing through apertures in the top of the casing, the partition therein, and through an aperture in the extension E' of the frame E. At the lower end, and below the partition C, this rod is provided with a collar P', to which is rotatably secured one end of the connecting-rod Q, the



other end of said rod being secured in a similar manner to the free end of the rock-arm F.

$P^2$  is a collar similar to  $P^1$ , secured to the rod at such a distance from the latter as to allow said rod to be forced down a distance sufficient for the rock-arm F to describe an arc of a circle, said arc being preferably of ninety degrees.

Telescoping the rod P and projecting upwardly through the top of the casing is a tube R, the upper end of which terminates in a knob  $R^1$ , while the lower end abuts against the collar  $P^2$ .

$R^2$  is a spline extending the entire length of the tube, and  $g'$  is a recess in the casing adapted to receive the spline, thus forming a guide for said tube which has a vertical reciprocating motion equal to that of the rod P, but independent of it.

The tube R is locked at the upper extreme of its vertical position, and movement in either direction is prevented by a spring-lock, which enters a notch or aperture  $h$  in said tube. This locking mechanism comprises a bolt  $i$  in a recess in the top of the casing, a shoulder  $j$  thereon, and a spring  $k$  abutting against said shoulder for actuating the bolt, and parallel therewith is a spring-arm  $l$ , which carries a lug  $m$ , adapted to engage with a notch  $n$  in the bolt when the same is withdrawn from the aperture in the tube.

$o$  is a lug or pin on the free end of the spring-arm  $l$  at one side of the bolt and in proximity to the tube R. Beneath these lugs the recess in the casing is enlarged to allow the spring-arm to be depressed, thereby releasing the lug  $m$  from the notch in the bolt.

The induction-coil which forms a part of my bath apparatus is of known construction, consisting, briefly, of an iron core  $r$ , a primary coil  $t$ , secondary coil  $s$ , and the usual vibrating tongue  $u$ , mounted upon suitable base  $v$ . The ends of the primary and secondary coils terminate in the binding-posts  $w w'$  and  $x x'$ , respectively, which in turn are connected in the battery-circuit and the bath-tub and brush, in the manner hereinafter described.

Slipping freely over the secondary coil and insulated from it is a metallic tube S, arranged to slide back and forth over said coil by means of a rod  $S^1$ , which connects it to the horizontal arm  $S^2$  on the vertical rod  $S^3$ . This latter rod extends upwardly at the rear of the clock mechanism through an aperture in the top of the casing and terminates in an arm T. By moving this arm back and forth, thereby exposing the coil to the magnetic influence of the iron core to a greater or less degree, I am enabled to regulate the strength of the current, and to indicate the degree of strength thus obtained, I arrange the regulator arm to move on the arc of a graduated circle  $T'$ , as shown in Fig. 2.

Above the vibrating tongue  $u$  and extending downwardly from the casing-top to one side of the vibrating tongue is a stationary

tube X, carrying at its lower end a small swinging finger  $X'$ . Y is a rod extending through the tube X, terminating at its upper end in the enlargement  $Y^1$ , extending a slight distance above the casing-top, and provided with a knob or button  $Y^2$ . At the lower end, below the tube X, this rod is provided with a finger Z adapted to engage with a notch in the swinging finger  $X'$ , causing said finger, when the rod is forced down, to strike a spring  $Z'$  fastened to and projecting from one side of the vibrating tongue  $u$ , thus setting it in motion if from any cause it should fail to start or cease to work while the current is on.

To prevent the finger from interfering with the vibration of the tongue when the coil is in operation, I insert in the tube X a spiral spring  $Y^3$ , abutting against the enlarged portion  $Y^1$  of the rod and the closed end of the tube, thereby keeping the swinging finger normally in the position shown in Fig. 1 away from the spring  $Z'$ .

On the extension  $E'$  of the frame E is secured a block V of insulating material in which is set a metallic contact-piece  $V'$ . To a metallic lug  $V^2$ , depending from the frame, is pivotally secured a movable contact-piece W, comprising a contact-plate  $W'$  and a finger  $W^2$ , adapted to bear against the collar  $P^2$  on the rod P when in the position shown in Fig. 1.

$y$  is a spring on the lug  $V^2$  bearing against the contact-plate, tending to keep said plate in contact with the contact-point  $V'$ . Near the pivotal connection of the movable contact-piece and integral therewith is a rod  $W^3$ , carrying an indicator-plate  $W^4$ . This plate is arranged opposite an aperture in the casing similar to the aperture O for the registering mechanism, and bears the words "On," "Off," or "Closed," "Broken," to indicate to the operator when the time of operation has expired.

In the lower compartment of the casing I place an electric generator, preferably a battery U, of any style suitable for the purpose required. I preferably use, as shown, a glass cell containing a solution of mercuric bisulphate, into which is suspended a positive zinc plate and a double negative plate of hard carbon. One of the electrodes is connected to the metallic frame E of the clockwork, as shown in Fig. 1, thereby making said frame a part of the battery-circuit. The other electrode is connected to one of the binding-posts  $w$ , and the remaining binding-post is connected to the fixed contact-piece  $V'$ . The primary circuit is completed when contact is made between the metal frame E and the contact-point  $V'$ .

The terminals of the secondary circuit  $x x'$  are connected to binding-posts on the top and side of the casing, from whence contact is made between the latter and the tub and brush. Any suitable means may be used in making contact between one of the terminals



and the metallic lining of the tub; but in making contact with the brush I prefer to use the means described.

$A^2$  is an ordinary bristle brush of suitable size and shape, the back and edges of which are insulated. Connected to it is a flexible insulated cable  $B^2$ , which may be suspended from a metallic hook placed conveniently near the tub, either on the wall or ceiling, suitable connection being made between the remaining terminal and said hook. I preferably construct the brush so that the cable may enter at one end thereof, and be soldered to a piece of silver or other suitable wire  $C^2$ , which is woven among the bristles of the brush, as shown in Figs. 6 and 7, thus reducing the resistance and making it a better conductor.

Having thus described the different parts of the device, the operation of the same is as follows: The parts of the apparatus being in the position shown in Fig. 1, the primary circuit is broken and the device is locked. When it is desired to start the apparatus, the attendant by inserting a key in the lock forces the bolt out of engagement with the notch in the tube R, when the lug  $m$  on the spring-arm  $l$  will engage in the notch  $n$  in the bolt, thereby holding the same in its unlocked position. The operator then forces the tube R downward, the lower edge of which, bearing against the collar  $P^2$ , will force down said collar, together with the rod P, a distance sufficient to cause the rock-arm F to move through an arc of a circle, preferably ninety degrees. The spline  $R^2$  will bear against the finger  $W^2$  until the tube is drawn back to its locked position, whence the finger  $W^2$  will be released and will allow the plate  $W'$  to make contact with the contact-piece  $V'$ , thereby completing the primary circuit and setting in operation the induction-coil from which the desired currents are obtained. The rock-arm F being secured to the main spindle of the clockwork will, upon being forced down, compress the main spring of said works and set in motion the usual train of gear-wheels. The speed of the clock mechanism, and thereby the bath period, will be regulated by the balanced escapement, and as the clockwork operates the rock-arm F will be driven back to its initial position, carrying with it the rod. The rod P will rise slowly upward until the collar  $P^2$  strikes the frame  $E'$ . The finger  $W^2$  of the movable contact-piece will be forced back by the collar  $P^2$ , thereby breaking the primary circuit and stopping the flow of the current. When the tube R is first forced down, the under face of the knob  $R'$  will strike the pin  $o$  depressing the spring-arm  $l$ , and thereby releasing the bolt which will bear upon the tube R until said tube is drawn upward to its normal position by the operator, when the bolt will engage with the notch  $h$  in said tube and the device will be again locked. Each time the rock-arm F is drawn down the pawl on said

arm engages with a tooth on the ratchet-hub I, driving the wheel H through a quarter of a revolution. One of the lugs K on this wheel engages at each quarter revolution with a tooth upon the star-wheel L, causing that wheel to revolve one tooth. The register-wheel being marked according to the number of teeth upon said star-wheel and being carried on the same spindle will register the number of times the bath has been used.

While I have not shown nor described means for further registration, it will be plainly seen that such results may be obtained by any multiplying mechanism, such as a worm upon the end of the spindle M engaging with a worm-wheel which would move over a space of one tooth when the star-wheel had completed an entire revolution.

An apparatus of this construction may be installed in ordinary or public bath-rooms and operated on the percentage basis, may be looked after and kept in order by an expert, and the best service to the patrons insured, while the owner's interests are guarded against the possibility of fraud, as the device registers each time it is used.

As will be seen the apparatus is so constructed that there will be no electrical action except while it is used, thus making the expense for maintaining the same in exact proportion to the number of patrons.

What I claim as my invention is—

1. An electric bath apparatus consisting of an electric generator, an induction coil in circuit therewith, and a registering and clock mechanism operating in connection with the generator and coil and forming part of the electrical circuit between the two, substantially as described.

2. In an electric bath apparatus the combination with an electric generator, of an induction coil in circuit therewith, a registering and clock mechanism, the frame of which forms part of the circuit, and a winding device for said mechanism which closes the circuit when operated, and breaks the same at the end of the period during which the mechanism is adapted to run, substantially as described.

3. In an electric bath apparatus, the combination with a clock mechanism, of a winding device for said mechanism, and means for automatically locking said device at the end of the period during which the mechanism is adapted to run, substantially as and for the purpose described.

4. In an electric bath apparatus the combination with a clock mechanism and of a winding device therefor, consisting of a vertical rod P, a collar  $P^2$  thereon, a telescoping tube R adapted to strike against said collar, a rock arm on the main spindle of the clock work, and connection between said rock arm and the rod P, substantially as described.

5. In an electric bath apparatus, the combination with a clock work mechanism, a wind-



ing device therefor, and a registering device in connection with and operated by the winding mechanism, substantially as described.

6. In an electric bath apparatus, the combination with a clock work, a winding device therefor, substantially as described, a gear wheel sleeved upon the main shaft of the clock work mechanism, a ratchet hub integral with said gear wheel, a pawl on the rock arm adapted to engage with the ratchet hub, pins K on said gear wheel adapted to engage with teeth on a star wheel L, and a register wheel adjacent to and on the shaft with said star wheel, substantially as and for the purpose described.

7. In an electric bath apparatus, the combination with an inclosing casing, of an induction coil, a metallic tube sleeved upon said coil, a lever arm S' pivotally connected to the tube and to the arm S<sup>2</sup> on a vertical shaft S<sup>3</sup>, and an index and regulating hand T secured to the upper end of the vertical shaft above the casing adapted to move on the arc of a graduated circle T', substantially as described.

8. In an electric bath apparatus, the combination with an inclosing casing and an induction coil therein, of a vibrating tongue for said coil, a swinging starting device for said tongue, a plunger extending without the casing and having connection with said starting device, and means within the casing for nor-

mally holding the starting device out of the path of the vibrating tongue, substantially as described.

9. In an electric bath apparatus, the combination with the inclosing casing, an induction coil therein, and a starting device for said coil comprising a drop tube X, a swinging finger X' on the lower end thereof, a rod Y extending through the tube, an enlargement Y' at the upper end and a finger Z at the lower end of said rod, engaging a notch in the finger X', and a spring Y<sup>3</sup> encircling the rod Y and interposed between the enlarged portion of said rod and the bottom of the tube, substantially as and for the purpose described.

10. In an electric bath apparatus, the combination with a clock mechanism, and a balanced escapement for said mechanism comprising a slotted plate *a* adjustably secured to the frame E, an upwardly inclined arm *b* integral therewith, a plate *c* pivoted to the free end thereof, a weighted arm *d* secured to and extending above said plate, and a similar arm *e* extending below the plate and adapted to engage with the stem *f* of the escapement, substantially as described.

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

WILLIAM E. GOLDEN.

Witnesses:

JAMES WHITTEMORE,  
E. FONTAINE.