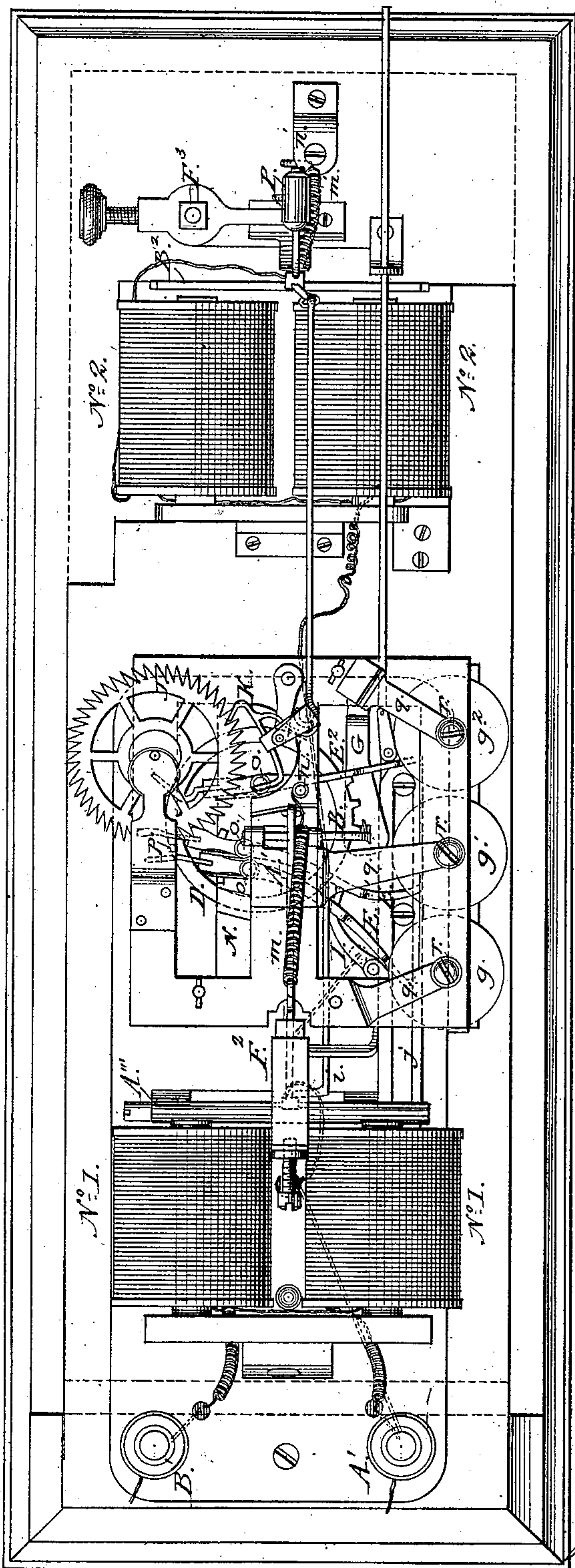


B. SMITH.  
Electric Annunciator.  
No. 230,969. Patented Aug. 10, 1880.

Fig. 1.



Witnesses:  
Geo. H. Michaelson.  
Emory Towner

Inventor:  
Benjamin Smith  
per E. W. Rouse & Co.  
Attys

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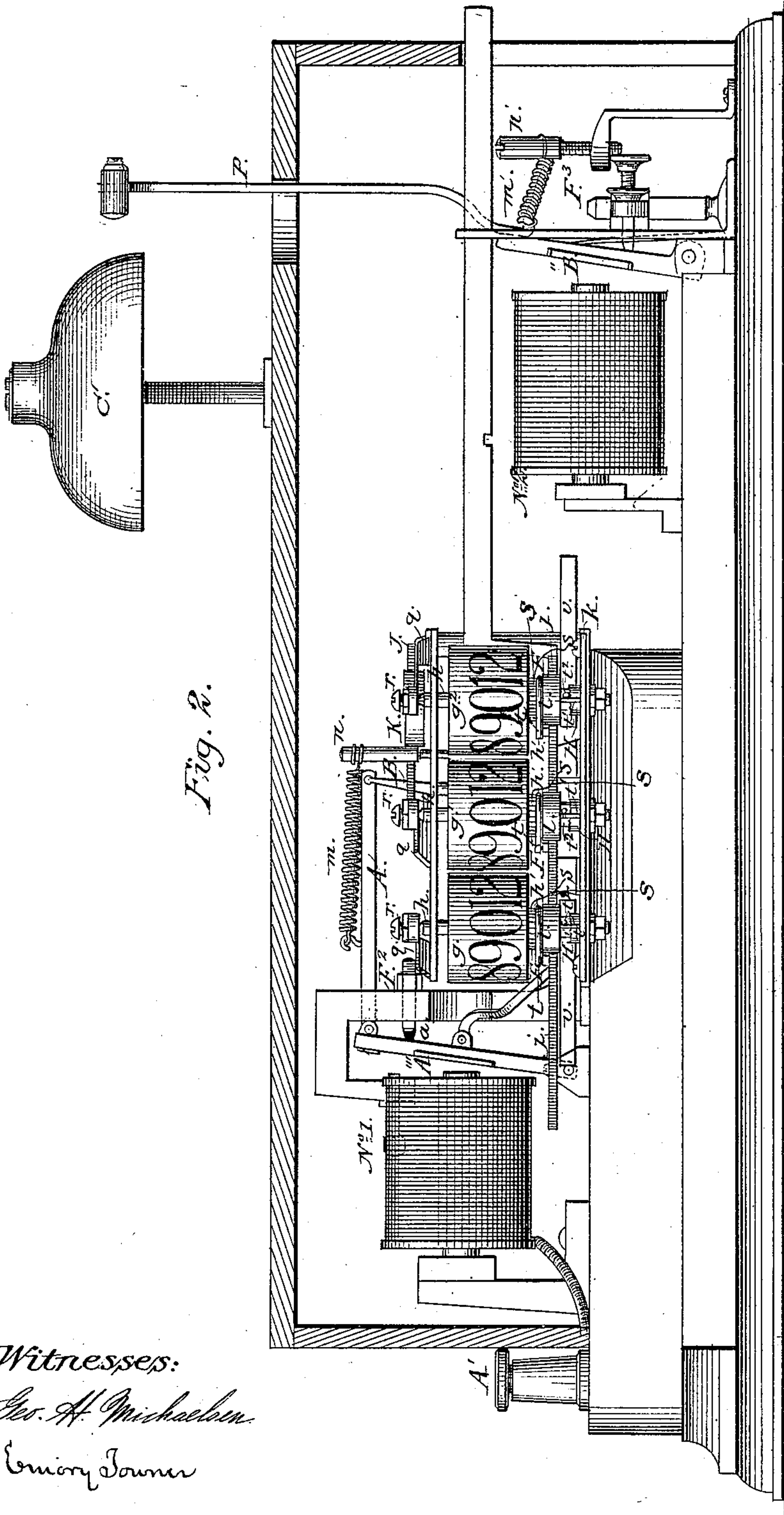


Fig. 2.

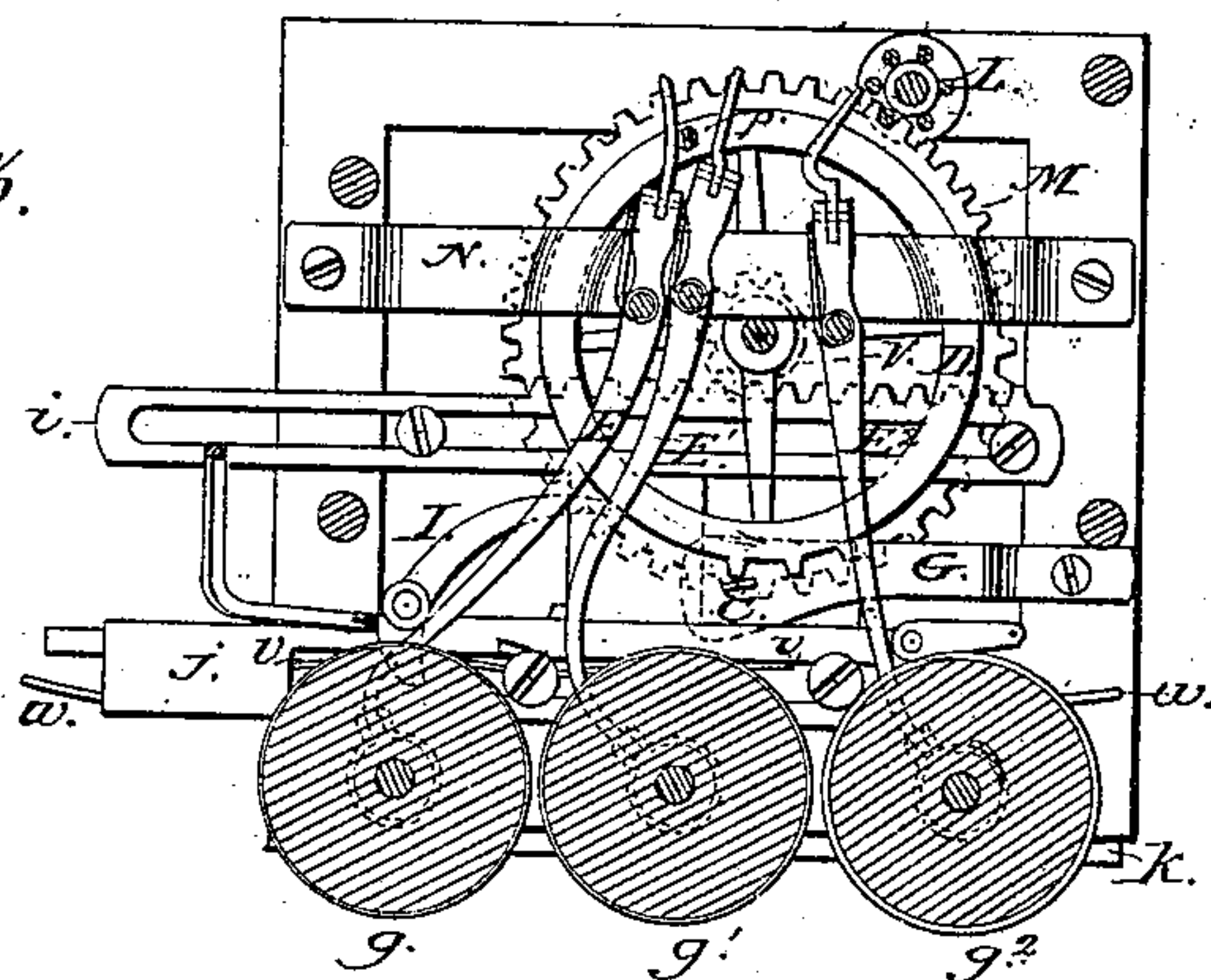
Witnesses:  
Geo. H. Michaelson  
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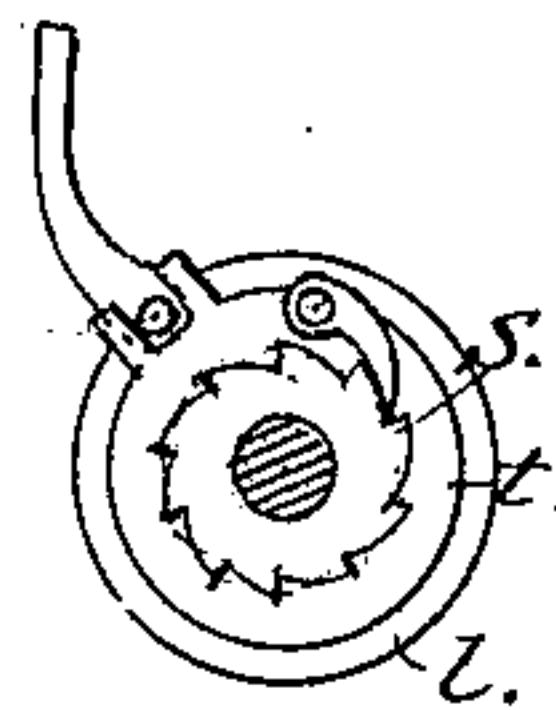
3 Sheets—Sheet 3.

B. SMITH.  
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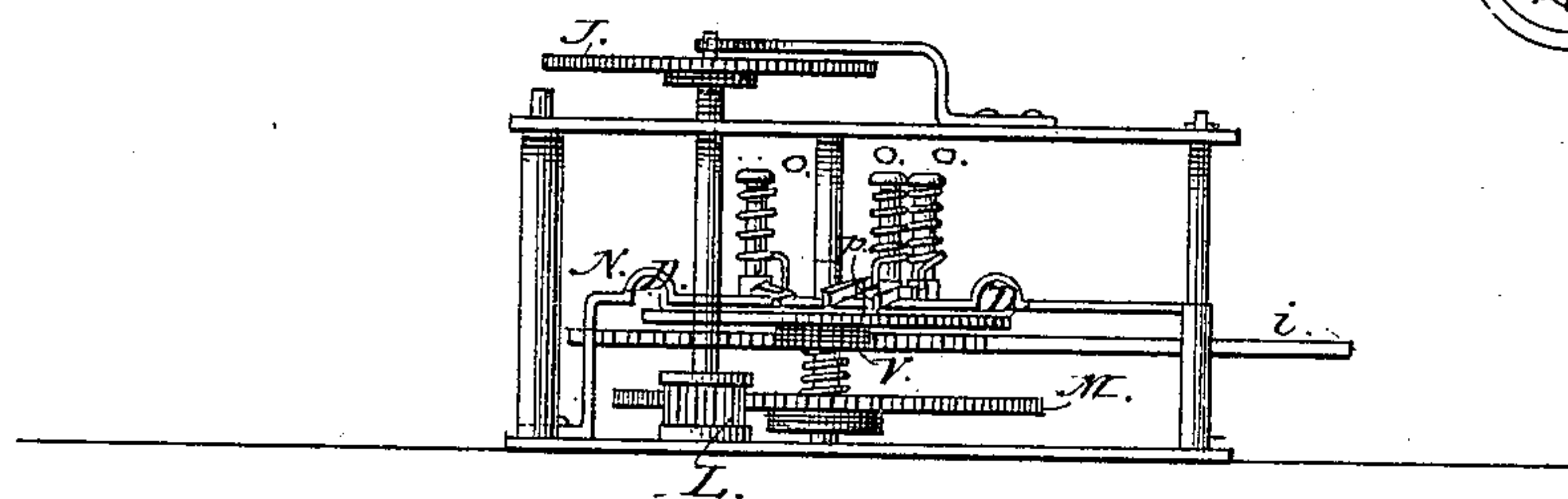
*Fig. 3.*



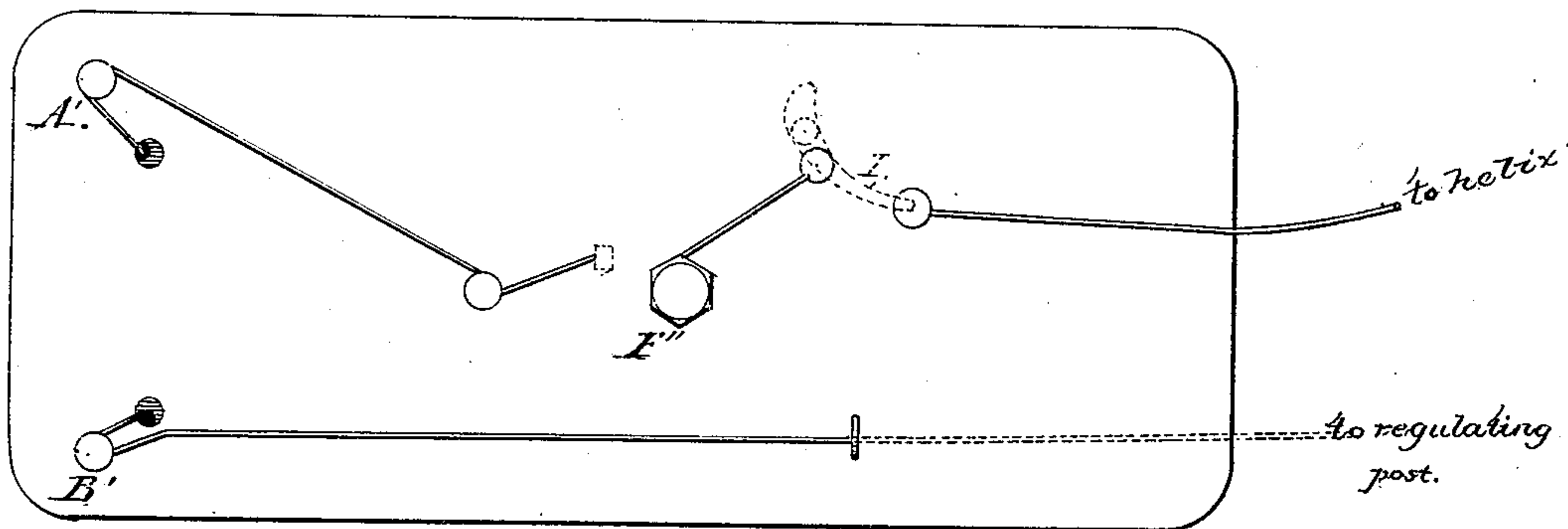
*Fig. 6.*



*Fig. 4.*



*Fig. 5.*



*Witnesses:*  
*Geo H Michaelson*  
*Emory Towner*

*Inventor:*  
*Benjamin Smith*  
*per E. W. Horn & Co.*  
*Atty.*



# UNITED STATES PATENT OFFICE.

BENJAMIN SMITH, OF UTICA, NEW YORK.

## ELECTRICAL ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 230,969, dated August 10, 1880.

Application filed December 9, 1879.

*To all whom it may concern:*

Be it known that I, BENJAMIN SMITH, of Utica, in the county of Oneida and State of New York, have invented certain new and useful  
5 Improvements in Annunciators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference  
10 being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention is an improvement in annunciators to be used in public houses and for fire-  
15 alarms, to be operated automatically through the influence of electricity.

It consists, essentially, of a series of devices forming an electro-magnetic system, in which the circuits, when closed and broken in a man-  
20 ner hereinafter to be described, create an impulsive movement to actuate an escapement and move certain machinery simultaneously with the sounding of an alarm and the exhibition of combinations of numbers on revolving  
25 cylinders, all of which will be fully set forth hereinafter.

In my drawings, Figure 1 is a plan or top view of the machine. Fig. 2 is a front elevation. Fig. 3 is a rear elevation, showing the  
30 metal frame and the parts inclosed within it. Fig. 4 is a horizontal section, showing in detail some of the important features of the device. Fig. 5 is a bottom view of the block on which the moving mechanism is fixed, showing  
35 the wires connected to the main line, electro-magnets, armatures, &c., to form the circuits. Fig. 6 is a detail drawing, showing the ratchets, pawls, and clutches connected with the posts of the numbered cylinders.

40 Similar reference-letters denote like parts in all of the figures.

Referring to drawings, No. 1 is a pair of electro-magnets, formed in the usual way, which are connected by insulated wires to  
45 binding-posts A' B', and which connect said electro-magnets to the main line of a galvanic battery. These magnets are mounted upon a block of wood with proper supports, and are suitably placed to attract a swinging armature,  
50 A'', when properly magnetized. A bar or rod, A, connected to said armature-post, has

attached to it and a post, n, a spiral spring, which, when the circuit is broken, recoils, drawing said armature A'' from the electro-magnets No. 1.

A crank-lever, B, connected by a hinge-joint  
55 to the rod A, extends downward toward a plate, G, which is permanently fixed to the metal frame of the machine. A guide or guard, C, is set obliquely upon said plate G,  
60 at a proper point, to direct the movement of the downward-extending arm of the crank-lever B, for a purpose to be hereinafter set forth.

A pair of electro-magnets, No. 2, are suitably  
65 fixed on the base-board of the machine, and placed so as to be opposite to a hinged or swinging armature, B<sup>2</sup>.

Extending up from the post of armature B<sup>2</sup> is a bent rod, which at its upper end has a  
70 hammer intended to strike a bell, C', mounted on top of the case of the annunciator.

A spiral spring, m', connects the armature B<sup>2</sup> with a screw rising from a support fixed to the base-board, which spring, in its recoil when  
75 the circuit is broken, withdraws the armature B<sup>2</sup> and starts the vibration of the hammer to sound an alarm.

An ordinary clock-escapement, composed of ratchet-wheel J and a pallet, K, is provided to  
80 be vibrated by the rod P and hammer attached thereto, which act as a pendulum to keep up a movement to the rotary part of the machinery, while the electric connection is broken, after  
85 being first started, by the closing of the circuit.

Upon a shaft journaled in the bottom plate of the metal frame and an arm attached to said frame's top plate, are the escapement-wheel J and a pinion, L, the latter of which  
90 engages with a spur-wheel, M, fixed on a vertical shaft which forms the common axis for it and a friction-wheel, D.

Studs o, fixed in a plate, N, form pivots or fulcrums for three levers, E E' E<sup>2</sup>, which are  
95 provided to actuate the numbered cylinders in the front of the machine. Said levers vary somewhat in form to suit their respective locations, but are practically alike. They are provided at their short arms with fingers so  
100 hinged that they are capable of being lifted automatically by a post or stud, p, fixed on the friction-wheel D, when said wheel is moving



in one direction, but will remain in their natural positions, to be engaged by said stud, when said friction-wheel is moving in an opposite or reverse direction. These levers are held normally against stops which rise from the plate N by spiral springs which are fixed to and coil about the ends of the studs *o*, and, extending back, bear against the side edges of said lever's short arms. Corresponding stops on plates N serve to limit the throw of said levers as they are moved by the friction-wheel D. The long arms of said levers E E' E<sup>2</sup> have their ends bent downward at right angles and horizontally forward, and are provided with pins which engage slotted collars or clutches to which are pivoted pawls adapted to engage ratchet-wheels F, secured to the under sides of the figured cylinders.

The figured cylinders *g g' g<sup>2</sup>* are secured to upright posts *h* and journaled in the upper plate of the metal frame and notched steps H, secured to the said frame's bottom plate. Flat springs *q*, fastened to the upper plate of the metal frame, extend forward with their ends over the ends of the upright posts *h*. Screws *r*, having conical ends, pass through the ends of the springs *q* and bear against the ends of the upright posts *h*. The object of the springs *q* is to furnish bearings that will by yielding admit of vertical play to the figured cylinders sufficient to allow them, in their rotary movement, to ride, with the pins attached to them or their posts, over the notches of the steps H.

The cylinders *g g' g<sup>2</sup>* are divided circumferentially into ten equal parts each, and these parts numbered from 0 to 9. The figures on their respective cylinders represent units, tens, and hundreds, to form combinations of numbers to be automatically announced.

Immediately below the figured cylinders on the posts *h* are fixed ratchet-wheels S, which have teeth corresponding in numbers with the figures on the cylinders.

Collared about the posts *h* are slotted clutches *t*, provided with pawls *u*, controlled by suitable springs, to be engaged by levers E E' E<sup>2</sup>, to move or rotate said cylinders in a manner hereinafter to be described.

Beneath the clutches *t* are friction-rollers *l*, which are employed, in connection with a resetting-bar, *j*, to be described, to return the cylinders *g g' g<sup>2</sup>* to their normal positions ready for new combinations.

The slide-bar *j* is provided with a vertically-cut longitudinal slot running a portion of its length. It rests and slides on ways formed by the upper surfaces of bosses which rise from the bottom plate of the metal frame. It is loosely secured to said bosses by screws which enter them vertically and serve as guides to the movement of said bar. Thin springs secured to the inner vertical wall of the said bar's slot bear against the guide-screws and cause said slide-bar to bear inwardly from friction-rollers *l*.

A slide-plate, *k*, is fitted in the bottom plate of the metal frame flush with the upper sur-

face, moves laterally, and has flat springs *v* secured thereto, which, when the slide-bar *j* is forced in for resetting, catch behind pins *w*, attached to said slide-bar, and draw said slide-bar forward with its roughened edge against the friction-rollers *l*. A small pin extending downward from said slide-bar serves the purpose, as the said bar is pushed in, to move the switch I and break the connection from the motor.

The friction-wheel D is loosely set on its shaft under the plate N, and has an upper bearing against an interposing plate fixed to said shaft. Attached to and forming a part of this friction-wheel is a pinion with a part of its teeth cut away, and a circular plate which forms a bearing to a spiral spring coiled about said shaft, which, by its expansive force, unites the friction-wheel, with its broken pinion, to the spur-gear wheel M. The said friction-wheel D has on its circumferential edge three teeth, which are engaged by the crank-lever B, one at a time, to move the said wheel D. It will be observed that the downwardly-projecting arm of the crank-lever B is springy, so that when it engages one of the three teeth and carries the wheel D forward in the direction of the arrow it is kept in engagement until it reaches the end of the guard C. It now springs outside of said guard and beyond the reach of the teeth until it returns where it started from, being controlled by the said obliquely-set guard. The stud *p* on friction-wheel D, which is engaged by the crank-lever B, bears against one of the fingers of the levers E E' E<sup>2</sup>, and moves it to revolve one of the numbered cylinders one point.

A sliding bar, *i*, slotted and provided with teeth, is held to the metal frame and guided in its movement by suitable screws. The friction-wheel D, after being moved to operate the levers E E' E<sup>2</sup> to expose the proper numbers, is moved by the motor in a direction reverse to that given it by the crank-lever B, until the broken pinion engages the rack *i*, when said friction-wheel is stopped, where it remains until the slide-bar *j* is forced in to reset the numbered cylinders. A piece of metal or a lug extending from the plate *i* brings said plate within reach of a couple of pins extending from the resetting-bar. As the rack is moved by the broken gear-wheel it carries the resetting-bar out, and when said resetting-bar is returned to reset it engages the rack and carries it back, and with it returns the friction-wheel D to its normal position, with the three teeth ready for a new impulse.

In operating the annunciator it is necessary to form a continuous circuit from the main line between the electro-magnets at opposite ends of the machine; but in starting the circuit is first formed between the magnets No. 1 and the main line. This primary circuit is formed by insulated wires passing from one binding-post through said magnets and out at the other binding-post, where connection is made with the main line.



The circuit through magnets No. 2 is formed through a wire connected to rear binding-post, running thence to regulating-post  $F^3$ , thence through regulating-screw to a strap-spring fastened to base, thence through armature-lever to one pole of the magnets No. 2, the other pole being connected with front binding-post by switch I, which is pivoted to the base and moved by a carbon-pointed lever actuated by the movement of the armature of magnet No. 1. The wires pass from the regulating-post  $F^2$  to armature-lever, thence to binding-post.

The switch I is automatically moved by the bar A, influenced by the spring attached thereto, to move the carbon-pointed lever to complete the circuit prior to establishing a continuous circuit between magnets No. 1 and No. 2 from the main line.

The armature of No. 1 being drawn back by spiral spring, rests against the non-conducting-point of the regulating-screw  $a$ .

It will now be readily seen that by closing the main circuit the armature of No. 1 magnets becomes the closing medium of the second or vibrating circuit the instant said armature is attracted toward the magnets.

When the current of electricity, passing through the armature of No. 1 magnets and the regulating platinum-pointed screw  $a$ , reaches No. 2 magnets the vibrator is set in motion by the armature of No. 2 magnets. Simultaneously with this effect connecting-rod A moves the crank-lever B and its spring end, which is inside of guard C, against a tooth on friction-wheel D, forcing said wheel backward. The upright post or stud  $p$  on said wheel engages the hinged finger of lever E, and causes it to move the cylinder  $g$  one-tenth of its circumference to expose one number.

Pins  $t^2$ , projecting horizontally from the posts to which cylinders are attached, rest in the notches of the steps H, being pressed down with said posts by the springs which cap them after each movement of said cylinders, the notches, as previously mentioned, corresponding with the numbers of said cylinders. When the tooth of friction-wheel D has been moved the crank-lever end remains at the back end of the guard C, clear of said wheel D. The spring applied to jointed lever E now overcomes the friction or tension of the wheel D, forcing it to its former position, so that if the circuit is broken and closed at short intervals the same tooth will be moved at each impulse and the one cylinder be repeatedly moved by its lever.

If the circuit remains closed a given time the vibrator or motor will carry the friction-wheel D steadily with it until the upright stud  $p$  in friction-wheel passes under and in front of the next jointed lever  $E'$ , which rotates the second cylinder. If the circuit remains closed a double length of time the stud  $p$  will pass from the first to the third lever,  $E^2$ , thus giving a chance to utilize the cipher on the tens-cylinder. After the friction-wheel

has performed its work of moving the cylinders it is carried by the motor until the part-gear pinion connected with and forming a part of wheel D engages the rack  $i$ , and is held from further movement by the motor.

To more fully illustrate, let it be supposed that the number 234 is announced from the cylinders. To make this combination the circuit is broken twice at short intervals, then remaining closed a given time the motor carries the wheel D around, so that the stud  $p$  passes under and in front of the second jointed lever,  $E'$ . The circuit is broken three times at short intervals; now remaining closed its given time, it is then broken four times at short intervals. The result exhibited is 234. The circuit is now closed and remains so for a time, and the motor carries the friction-wheel D around until it is held by the part-gear wheel engaging the rack  $i$ . The 234 remains exposed while the motor continues to sound the bell or alarm, until the resetting-slide  $j$  is pushed in and carries the rack  $i$ , and with it the part-gear wheel, to return the wheel D to its first position, with its stud in front of the finger of the first lever, E, and the first tooth of said wheel is ready to be engaged by the crank-lever B. The pin extending downward from the resetting-slide  $j$ , when said slide is pushed in to reset, comes in contact with one arm of the switch, throwing it back to break the circuit and stop the motor.

In returning the resetting-slide  $j$  the pins  $w$  at its ends pass over the strap-springs  $v$ , attached to the slide  $k$ , which draw said slides  $j$  and  $k$  together, forcing the rubber friction-rollers  $l$  in contact with the serrated or roughened edge of said slide  $j$ , and bringing the pins  $t^2$  within reach of corresponding pins  $t'$  in the slide-plate. When the slide-bar  $j$  is pushed in the cylinders are simultaneously revolved until they are stopped by the pins  $t^2$  and  $t'$  coming together, when it will be found that the cipher alone is exposed to view from the face of the annunciator.

When the strap-springs W are released from the slide  $j$  the slide-plate  $k$  is returned to its place. The slide  $j$  is now withdrawn from contact with the rubber roller by the springs within its slot, and the cylinders are again left free for new announcements.

The rack  $i$ , which is also returned by the resetting-slide, leaves the friction-wheel D free, there being no teeth in the part-gear wheel next to the said rack to interfere with its movement.

Outside of the motor and its associate parts is a case provided with an elongated opening in front, through which may be seen the numbers or figures, as they are exposed through a plate with sights attached to the frame of the motor.

Hinged to a crank which projects from the resetting-slide  $j$  is a bar,  $B^5$ , extending through the case, by which said slide is moved when it is necessary to reset the cylinders.

Having thus described my invention, what



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

1. In combination with an electric circuit formed through the agency of electro-magnets 5 1 and 2 and their armatures and switch I, connected with the main line of a battery, the escapement moved by the vibration of the rod or pendulum P, to carry the motor and sound-bell C, as and for the purpose set forth.
2. The electro-magnets No. 1 and No. 2, lo- 10 cated at opposite points on a base and provided with hinged levers, armatures, and the usual setting and regulating devices, in combination with the switch I, and the carbon- 15 pointed lever hinged to the swinging armature-lever of armature No. 1, whereby the primary and auxiliary circuits are completed preparatory to the establishing of a continuous electric connection between magnets No. 1 and No. 2, 20 as and for the purpose specified.
3. The friction-wheel D, held by tension through a spiral spring coiled about a vertical shaft which bears against said wheel, and a spur-gear wheel permanently attached to said 25 shaft, said wheel D being moved automatically from the vibration of a pendulum conveniently located and receiving its impulse by force of an electric current, as and for the purpose specified.
4. The levers E E' E<sup>2</sup>, pivoted in the metal 30 frame of the motor, having jointed fingers on their arms at one end and pins fixed to their opposite ends, adapted to engage clutches t, as and for the purpose set forth.
5. In combination with armature of magnets

No. 1 and horizontal bar A, hinged thereto, the crank-lever B, obliquely-set guard C, wheel D, and levers E E' E<sup>2</sup>, as and for the purpose set forth.

6. The combination of the wheel D, provided 40 with stud p, crank-lever B, levers E E' E<sup>2</sup>, clutch t', ratchet S, and pawls u, as and for the purpose specified.

7. In combination with the escapement and pendulum, the friction-wheel D, having at- 45 tached to it a part-gear wheel, V, the rack i, and resetting slide-bar j, as and for the purpose set forth.

8. The resetting-slide j, in combination with friction-rollers l and numbered cylinders g g' g<sup>2</sup>, 50 as set forth.

9. The resetting-slide j, provided with a slot to serve, together with screws set therein, to guide it in its movement, and having small flat springs to give it a lateral bearing inward, 55 in combination with lateral slide-plate k, provided with springs v, adapted to engage pins w fixed in the slide-bar j, as specified.

10. In combination with cylinders g g' g<sup>2</sup> and the posts to which they are attached, provided 60 with pins t<sup>2</sup>, the steps H and spring-bearings q, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

BENJAMIN SMITH.

Witnesses:

CHAS. M. HITCHCOCK,  
W. M. PHILLEO.