

A. C. FRIESEKE.
ELECTRIC TIME RECORDER.

No. 339,092.

Patented Mar. 30, 1886.

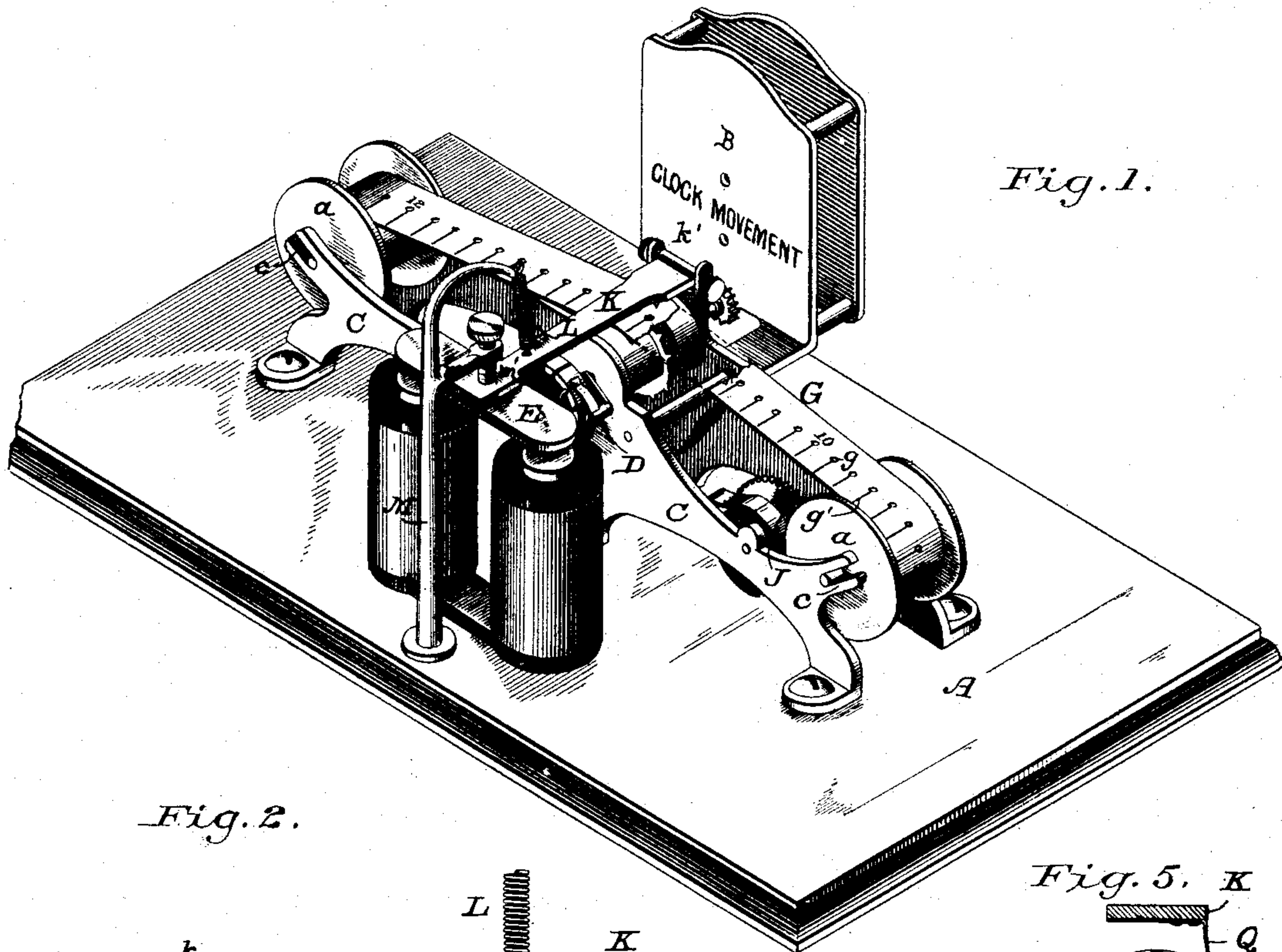


Fig. 2.

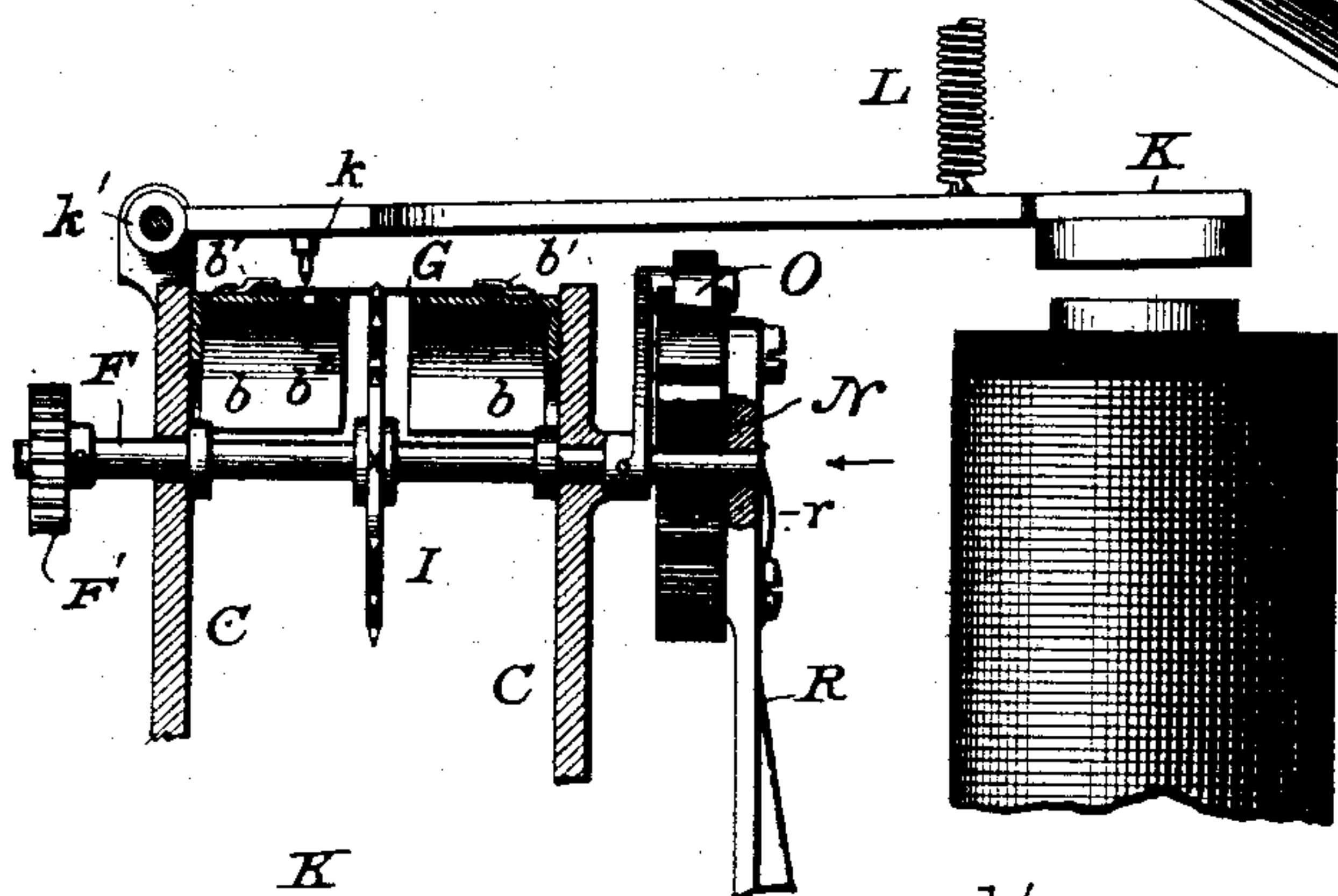


Fig. 3.

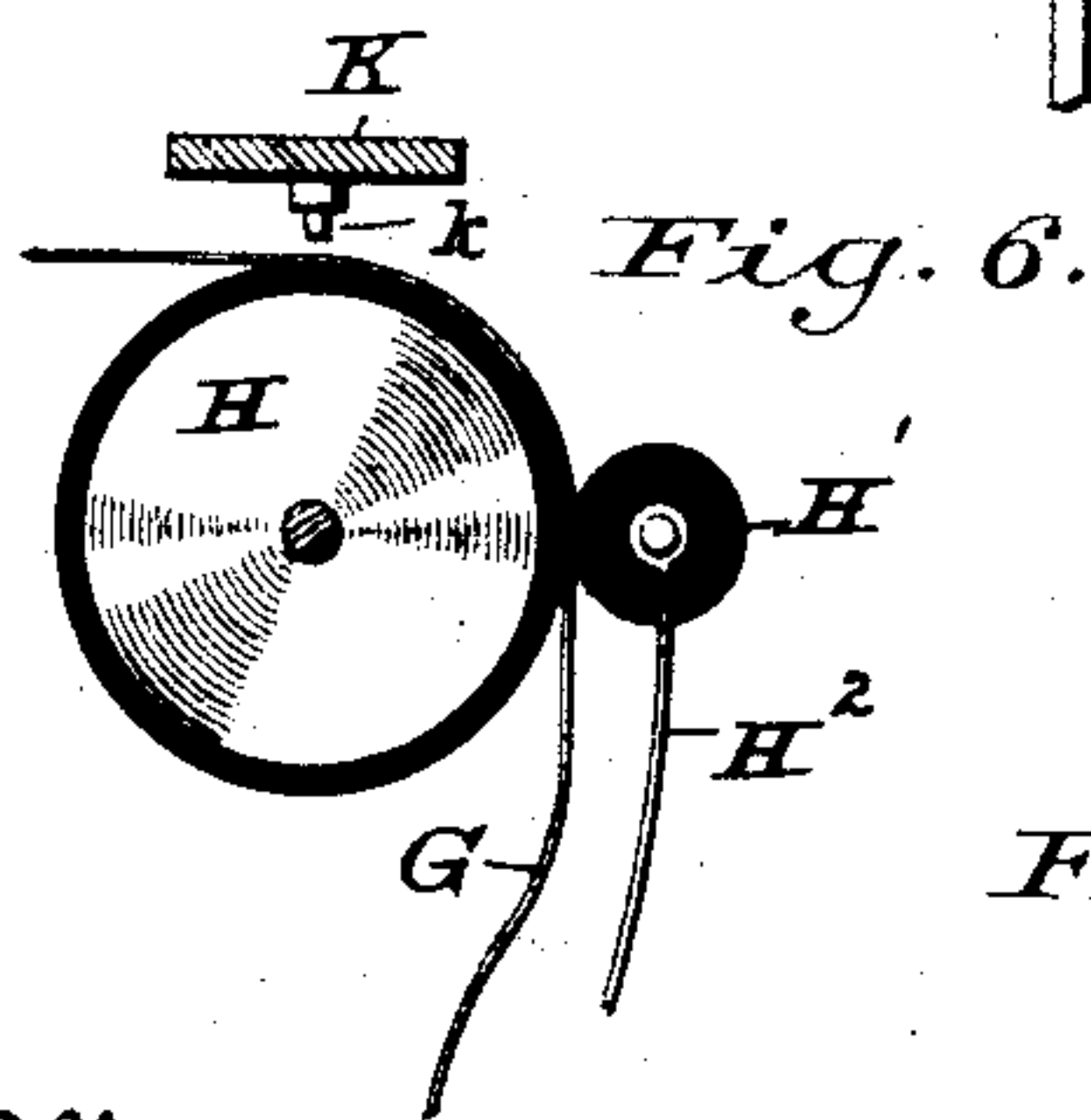
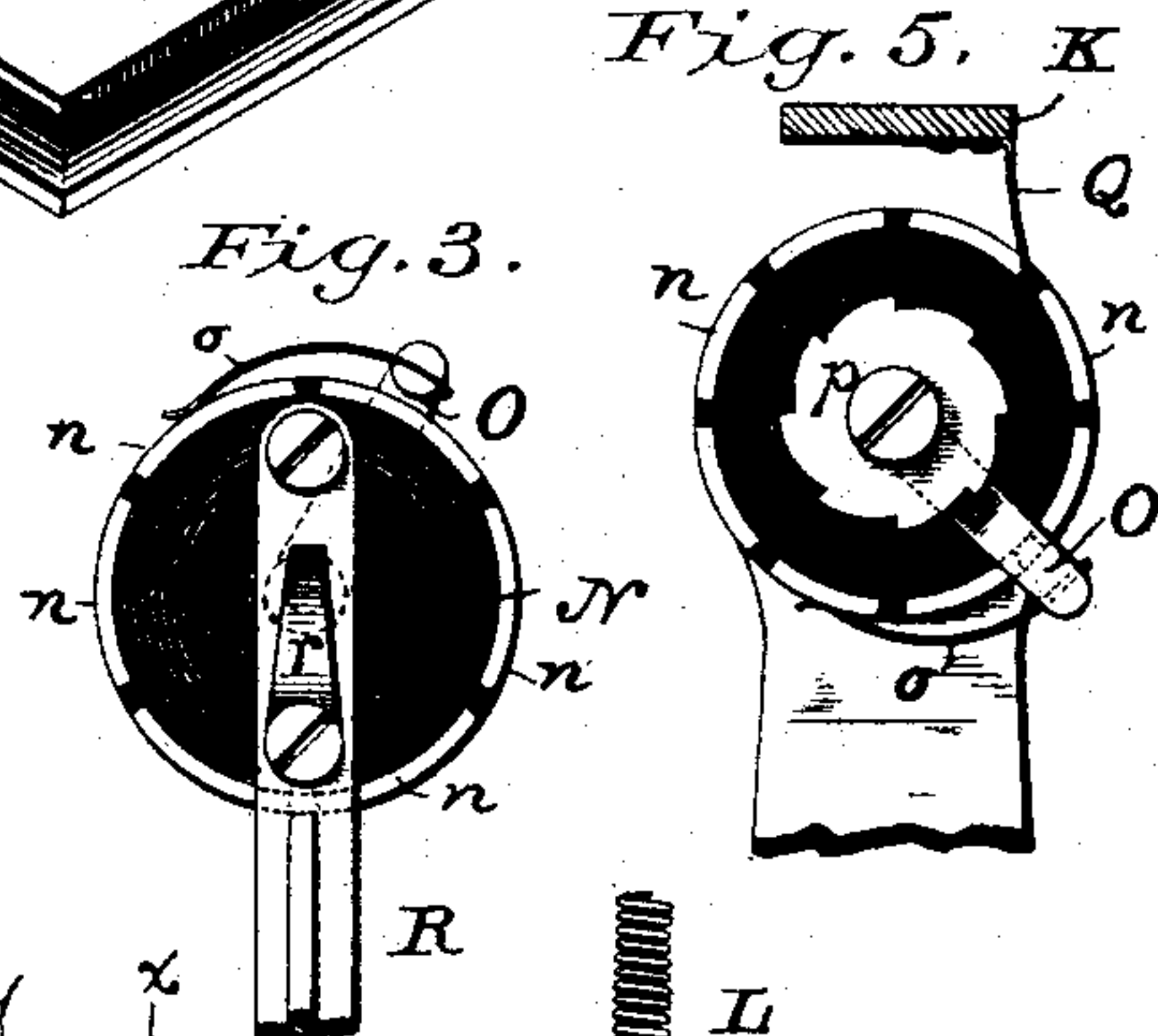
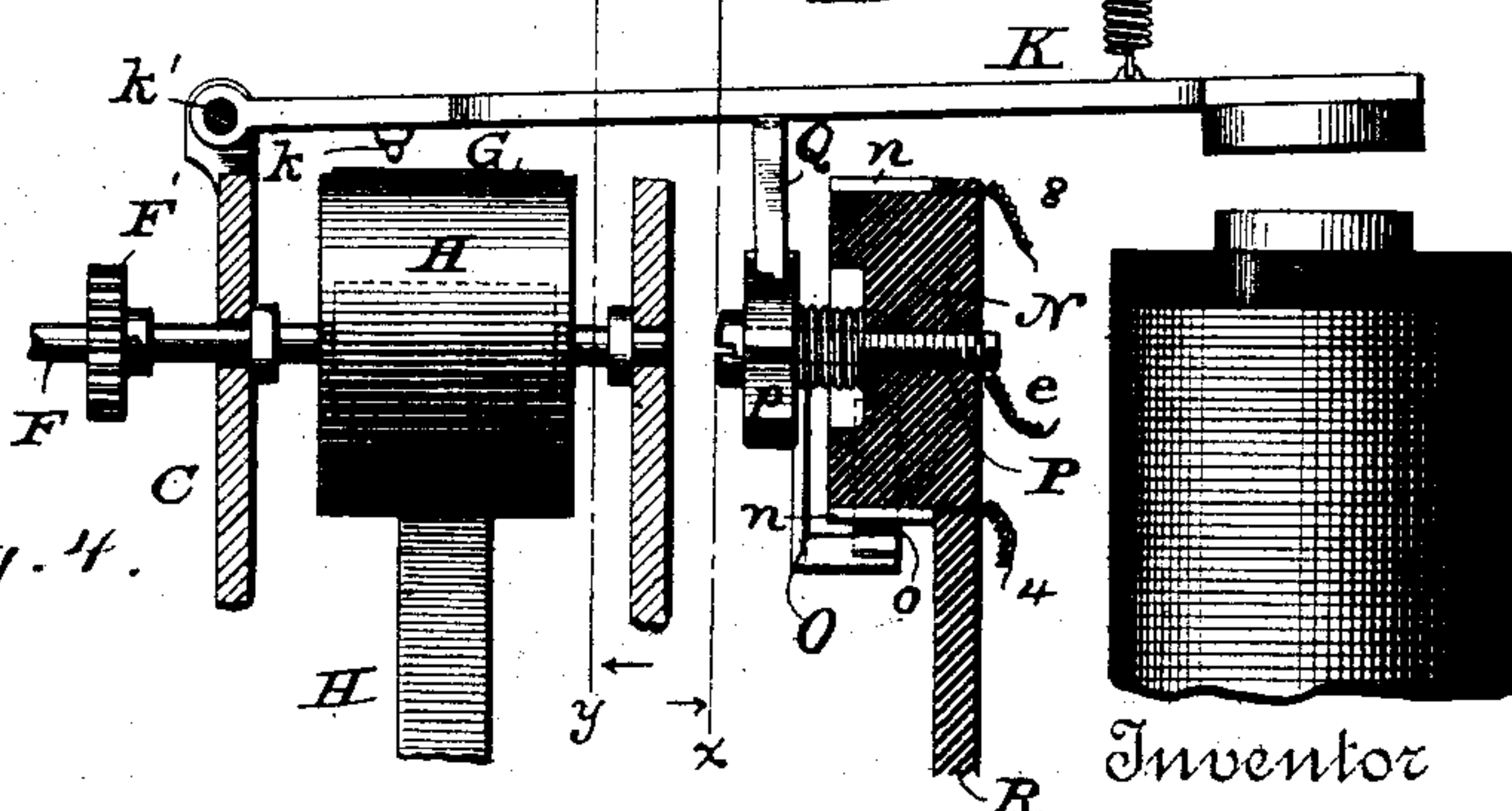


Fig. 4.



Witnesses

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Geo. W. Young.

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Fig. 7.

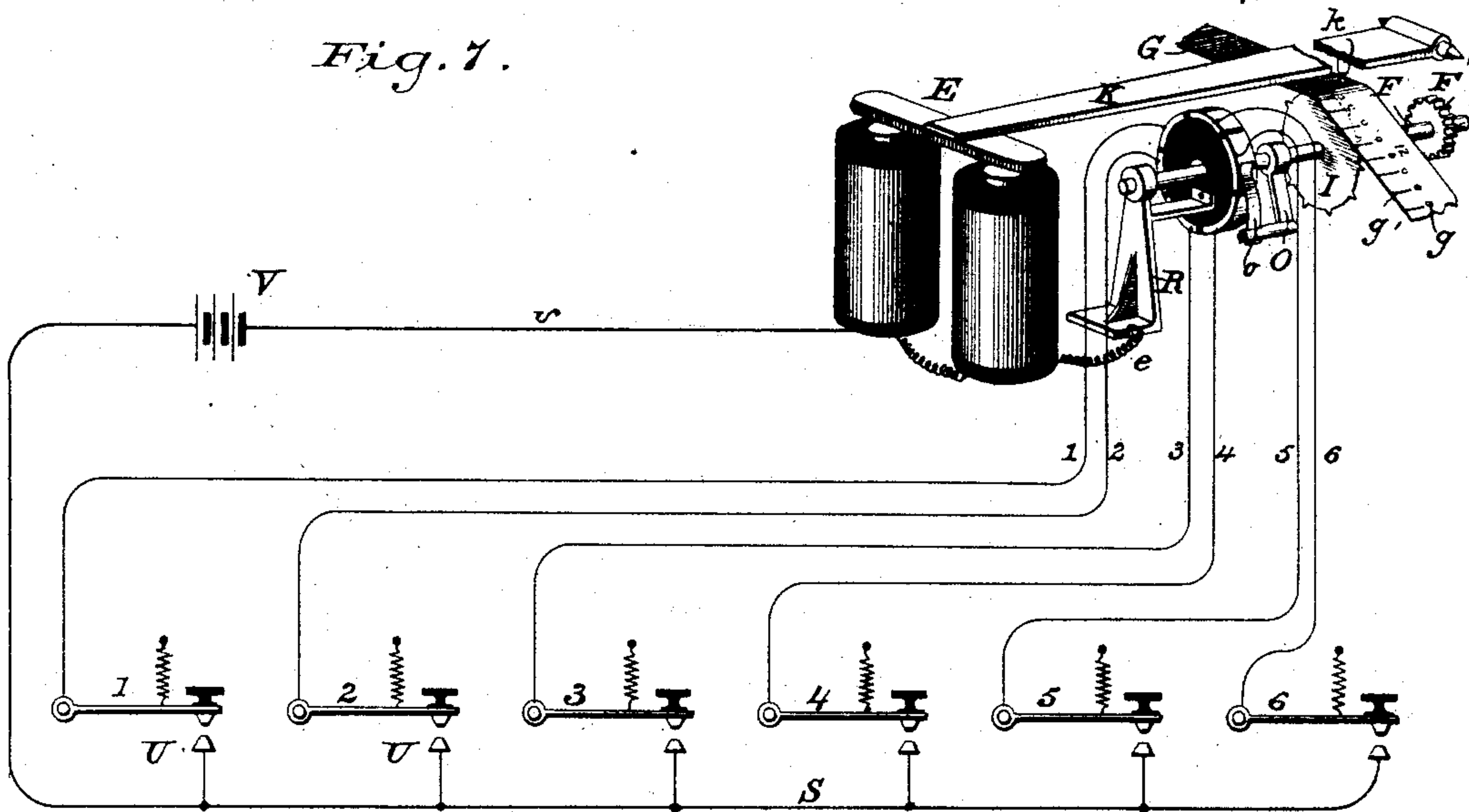
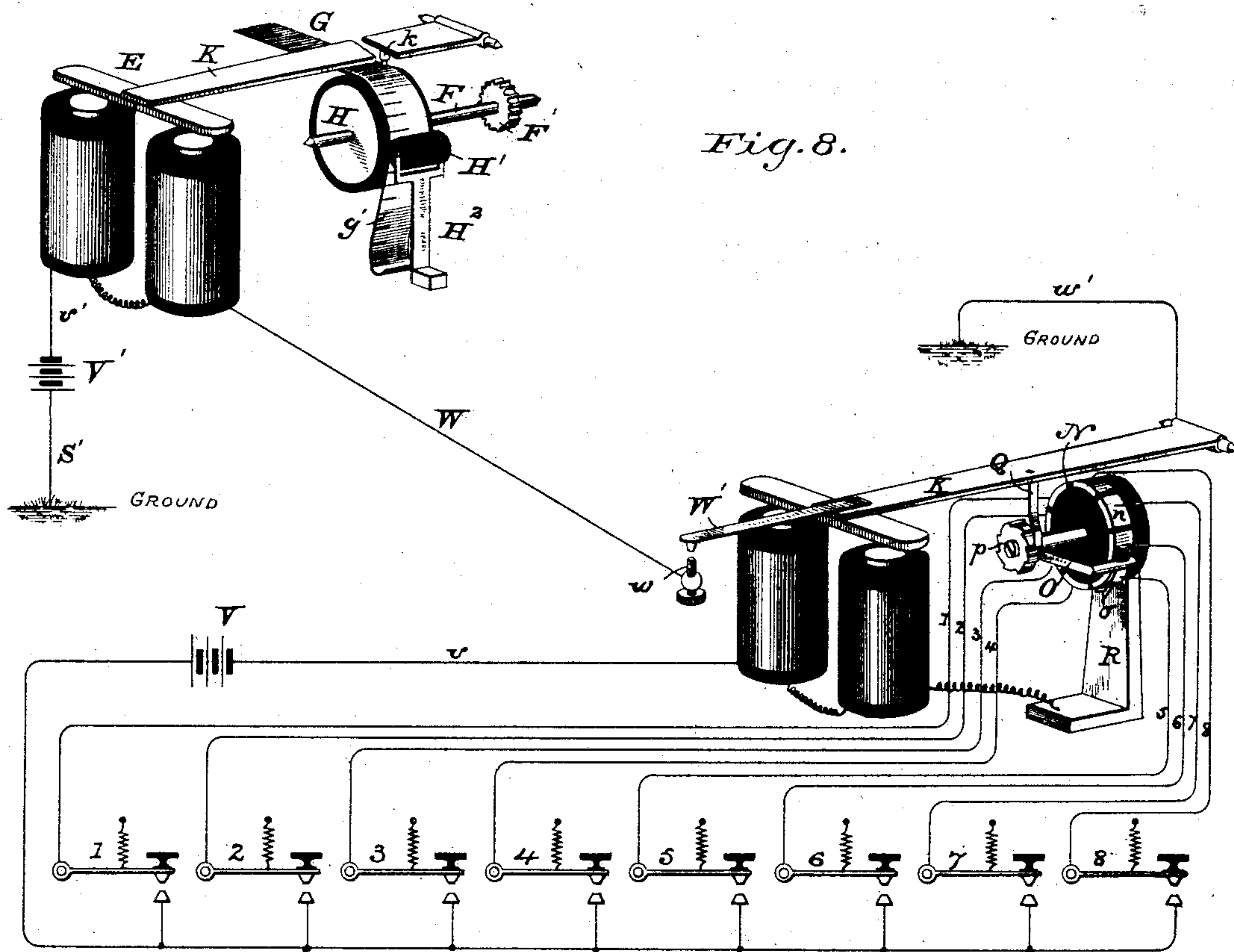


Fig. 8.



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UNITED STATES PATENT OFFICE.

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ELECTRIC TIME-RECORDER.

SPECIFICATION forming part of Letters Patent No. 339,092, dated March 30, 1886.

Application filed December 7, 1885. Serial No. 184,984. (No model.)

To all whom it may concern:

Be it known that I, ALBERT C. FRIESEKE, a citizen of the United States, residing at Jacksonville, in the county of Duval and State of Florida, have invented certain new and useful Improvements in Watchman's Electric Time-Recorder; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to watchmen's time-detectors of that class in which a clock-movement or suitable train of gearing is employed to regulate the feed of a narrow strip of paper beneath a stylus which, when actuated, prints a character or punctures the strip, thereby registering the time at which the stylus was actuated.

Heretofore, when the watchman had to press a button at each station or room under his surveillance, so as to register the time at which he visited such station, a separate line, magnet, and stylus had to be provided for each line; and, again, that the watchman may not remain at a certain station and register from any one fixed point without the same being made known, the magnets are arranged in such relative positions and the armatures carrying the points are so constructed that the points are in a line at right angles to the path of the strip, and each point occupies a different position relative to the width of the strip. Thus, if the registering is done from any one point, the imprint of the point or stylus corresponding to such point will be in a line parallel with the edge of the strip, whereas, if the watchman observes his duty the imprints will occupy different positions on the strip. It has been proposed to use but a single magnet to do the registering, in which case a clock-movement is placed at each station and so arranged as to close the circuit at that point by the simple winding of such movement when the same has run down sufficiently to permit the winding. This arrangement has been found objectionable and faulty, as the registering may be done from any desired station by the winding of the movement at fixed intervals when

the same has run down sufficiently to permit but a three-fourths turn of the spring-barrel arbor. My invention is designed to overcome these objections and make it obligatory that the watchman should go his rounds, and that the stations thereof be visited in succession. Otherwise no registry will be made, as the line-circuit when closed at one point is shifted and can only be closed again at the next consecutive point, and so on. By my system and arrangement the number of parts are reduced to a minimum, thereby simplifying such systems, and the operation of the various elements are positive, thereby rendering the system more efficient.

In carrying out my invention the elements employed are a clock-movement, a paper fillet regulated in its travel thereby, an electro-magnet, the armature of which is provided with a stylus to imprint upon the fillet, and a circuit-changer, which forms the terminal of the lines from the various stations or points from which the registering is to be done.

My invention consists in combining with a paper fillet a clock-movement to regulate its feed, an electro-magnet to actuate an armature carrying a stylus, and a circuit-changer.

It also consists in combining with such movement an arm which forms one terminal of all the stations, and which is carried thereby over a series of contacts forming the other terminal, thereby establishing and breaking the line-circuit from each point in succession.

It further consists in the circuit-changer and electro-magnet with means whereby the circuit-changer is positively operated upon by actuating the armature of the electro-magnet, which armature at the same time may or may not close a local circuit to the register at a distant point, as desired.

It also further consists in combining with the fillet a continuous positive feed, which is held in check and the feed of the fillet regulated by the aforesaid clock-movement. To render more positive the action of the clock-movement on the fillet, the latter is perforated throughout its length at stated intervals, and such perforations are engaged by the teeth of a sprocket-wheel having its motion governed by the clock-movement.

In addition, the invention consists in the novel details of construction and combination

of parts, as more fully shown and hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of my improved register.

Fig. 2 is a side elevation of the upper portion thereof, partly in section. Fig. 3 is a view of the circuit-changer and its support as it appears when viewed in the direction of the arrow, Fig. 2. Fig. 4 is a view similar to Fig. 2, of a modified form. Fig. 5 is a section on the line X X of Fig. 4, looking in the direction of the arrow. Fig. 6 is a section on the line Y Y of Fig. 4, looking in the direction of the arrow. Figs. 7 and 8 are diagrammatic views.

The base A supports all the operating parts of the register, which consist of the clock-movement B, frame C, which supports the fillet-reels and the fillet-regulating devices, circuit-changer D, and registering-magnet E. The opposite ends of the frame C are provided with upwardly-inclined slots *c*, for the reception of the journals of the fillet-carrying reels *a*. A shaft, F, suitably journaled in the sides of the frame C, has connections with and is driven by the clock-movement, preferably by means of a pinion, F', secured on or near the end of the shaft. A fillet, G, passes over this shaft, and has its movement regulated thereby, which may be done in numerous ways, either by affixing a roller, H, to the shaft, having an elastic surface, and having a second roller, H', mounted in a yielding or spring support, H², pressing against and acting in conjunction with the roller H, to keep the fillet in close contact with the roller H, between which and the roller H' it passes. A second method of feeding the fillet is to have it pass over a bed, *b*, beyond the surface of which the teeth of a sprocket-wheel, I, extend to engage the perforations *g* in the fillet, which perforations may be made to correspond with the short cross-lines *g'*. These cross-lines and perforations indicate intervals of time of any duration. For convenience they are shown as representing intervals of five minutes, or twelve divisions to an hour's time. The sprocket-wheel has twelve teeth, and is so moved that it makes a complete revolution in sixty minutes, during which time the fillet has moved forward twelve divisions, which represent one hour's time, and is so marked on the fillet to facilitate the reading. It will be understood that these two devices may feed the paper forward; but it is found preferable to have the fillet fed forward in a positive manner and use the clock-movement as a retarder or regulator. For this purpose the movement shown at J is employed. Where the fillet is positively fed, as just described, it is liable to slip between the rollers, as H H'. Consequently the sprocket-wheel is deemed best, either with or without the fillet being perforated, although the perforations are best. Keepers *b'* are employed to hold the fillet to the bed. The armature K of the registering-magnet E is provided with a point or stylus, K, which impresses the paper when the magnet is energized, to indi-

cate the time at which such impress was made. When the roller H is employed, its elastic surface forms the bed and permits the indentation of the fillet, as will be readily understood; but when a bed, as *b*, is employed the same is perforated, as at *b'*, in register with the stylus. A carbon-strip or inked ribbon may be advantageously used, if desired, and can be readily attached; but as this forms no essential feature or part of the invention the application of the same is not shown.

For convenience of illustration, the magnet is shown opposite the clock-movement, and its armature is hinged at one end to the frame C at *k'*, and extends over the shaft F. A retracting-spring, L, holds the armature at a distance from its magnet, the distance being regulated by a set-screw, *m'*, passing through an arm, *m*, of the overhanging standard M, from which the spring L depends.

The circuit-changer is composed of a disk, N, of rubber, wood, or any suitable insulating material, a number of contacts, *n*, arranged around the periphery, but electrically insulated from each other, and a moving contact, *o*, carried by a crank-arm, O, keyed to or mounted on a shaft in axial line with the center of the disk N. This shaft may be either the shaft F, with which it moves, or the shaft P, which consists of a screw passed through the disk and a ratchet-disk *p*, mounted thereon, to which the arm O is affixed. In the first instance the arm O and its contact *o* is moved in unison with the feed-regulating devices and is independent of the movement of the armature of the magnet. In the second device the contact *o* is moved at each movement of the armature, and is therefore preferred, as the circuit-changer may be located at a distance from the register, thus saving the cost of having a multiplicity of wires running direct to the register. The circuit-changer in this instance is provided with an electro-magnet independent of the registering-magnet, and is used to close a local circuit to the register, as more fully hereinafter set forth.

Projecting from the armature K is a spring-pawl, Q, which engages a tooth of the ratchet-disk *p*, and moves the same forward at each movement of the armature. This movement preferably takes place at each retraction of the armature. This form of circuit-changer may be used in connection with the register, as clearly indicated in Fig. 4.

To effect an electrical connection between the shaft F and a terminal of the registering-magnet, the shaft is extended and journaled in a bracket or support, R, which is in electrical connection with such terminal.

To insure a positive and continuous connection, a spring, *r*, is secured to the standard and its upper end arranged to bear on the end of the shaft.

Referring to the diagrams 7 and 8, the numerals 1 2 3, &c., represent the line-circuits from corresponding stations, 1 2 3, &c., each

line terminating with one of the fixed contacts n on the disk N . Each station is provided with a circuit-closing key, U .

Having reference to Fig. 7, V represents an electric battery; v , a wire connecting with a terminal of the registering electro-magnet, and S the other terminal or pole of the battery, connecting with the various stations 1 2 3, &c.

The operation is as follows: The arm or contact o is shown as resting upon and electrically connected with the terminal of the line-wire from station or point 5. The circuit being closed at this station the current will be from the battery through wire v , to magnet, to standard R by wire e , through shaft F to arm O , from arm O to line-wire 5, through contacts $o n$, thence to battery through wire S . The current in its passage will energize the magnet and cause it to attract the armature, the stylus of which will impress the fillet at one side of the perforations or division-marks, thus indicating the time at which the circuit was closed at station 5. It is evident that a current cannot be sent from any other station by reason of the interruption of the lines at the circuit-changer. From the foregoing it will be understood that the arm or contact o moves from one contact, n , to the other in succession, thus successively opening one circuit or line and closing the next; hence, it is apparent that the registering can only be done from the proper point and from each in succession. This construction is best adapted for short circuits, where the stations are comparatively near the register; but where it is designed to use a second, but single register, and to locate it at a distant point from the stations under surveillance, the construction shown in Fig. 8 is resorted to. In this latter case I use two registers or a register and circuit-changer simply, the former being constructed as described, with this exception, that the circuit-changer is dispensed with, the registering-magnet being included in a local circuit, which is closed by the circuit-changer magnet. The local battery V' has one pole connecting with the registering-magnet by wire v' . The other pole is grounded by wire S' . A line, W , connects the register with a point, w . An arm, W' , carried by the armature of the circuit-changer magnet, serves to close the local circuit through the ground-wire w' when said armature is actuated. This may be done in a number of ways, and I do not restrict myself to the manner shown, in which said arm W' is in electrical connection with the armature and the latter grounded by the wire w' .

The operation is as follows: Upon closing the proper circuit through the circuit-changer its armature will be actuated and the local circuit closed by the contacting of point w and arm W' , as will be readily understood, thereby causing the registering to be done at the distant point.

By reason of the circuit-changer the proper

station must be visited before a circuit can be closed, to actuate the armature; hence, the registering can be done only from the proper point.

To prevent tampering with any of the parts, the devices will be incased and kept under lock and key, so that access may be had thereto only by authorized parties.

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

1. A watchman's time-detector comprising the following elements in combination: a fillet, feed-regulator therefor, registering-magnet, and a circuit-changer to shift the circuit from one line to the other, in succession, to prevent registering being done from any one point, substantially as described, and for the purposes specified.

2. In a time-detector, the combination of a register and a circuit-changer to shift the line-circuit from one point to the next in order, to prevent registering from any one point, substantially as set forth.

3. The combination, with the register and its actuating-magnet, of a series of stationary contacts, each forming a terminal for a corresponding number of line-circuits, and a moving point forming a common terminal for all the line-circuits, to successively break and establish each line-circuit, whereby the circuit having been closed at one point is shifted and can only be closed at the next consecutive point, substantially as described, and for the purposes set forth.

4. The combination, with the register and its actuating-magnet, of a series of contacts electrically insulated from each other, arranged in a circle, and each forming the terminal of a series of line-circuits, of a point forming a common terminal for all the circuits, an arm connected therewith to carry it around in a circle from one contact to the other, and provisions, substantially as described, to move said arm forward to shift the circuit from one line to the next, to prevent registering being done from any one point, as and for the purposes set forth.

5. The combination of the fillet, a feeder continuously exerting a force to draw said fillet forward at a great impetus, and a retarder to stay the impetus of the fillet to govern its movement and regulate the force of the feeder, substantially as and for the purpose set forth.

6. In a time-detector, the combination, with a fillet divided into sections representing intervals of an hour and having each section perforated to correspond with an equal fractional division of an hour's time, of a feed-regulating wheel having teeth corresponding to the number of perforations in each section of the fillet and making a complete revolution in one hour's time to feed a section of the fillet, whereby the hour and fractional part thereof may be readily ascertained at

which a register is made on the fillet, substantially as set forth.

7. The combination of the fillet, perforated to correspond with equal divisions of time, a
5 feeder continuously exerting a force to draw the fillet forward at a high rate of speed, a retarding-wheel having teeth corresponding with such perforations, and having a movement corresponding with the time represented
10 by the perforations to check the speed of the fillet and govern the force of the feeder, substantially as set forth.

8. In a time-detector, the combination, with a series of contacts, each forming the terminal

of a line-circuit and arranged in close prox- 15
imity to each other and electrically insulated, of a point forming a common terminal for all the lines and a pawl operated by the movement of the armature to move the point and contacts relatively to each other, whereby the 20
line-circuits are successively established, substantially as and for the purposes set forth.

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

ALBERT C. FRIESEKE.

Witnesses:

A. W. COCKRELL,

A. WM. COCKRELL, Jr.