

No. 714,905.

Patented Dec. 2, 1902.

S. H. HOGGSON.  
ELECTROMECHANICAL CLOCK.

(Application filed Nov. 27, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

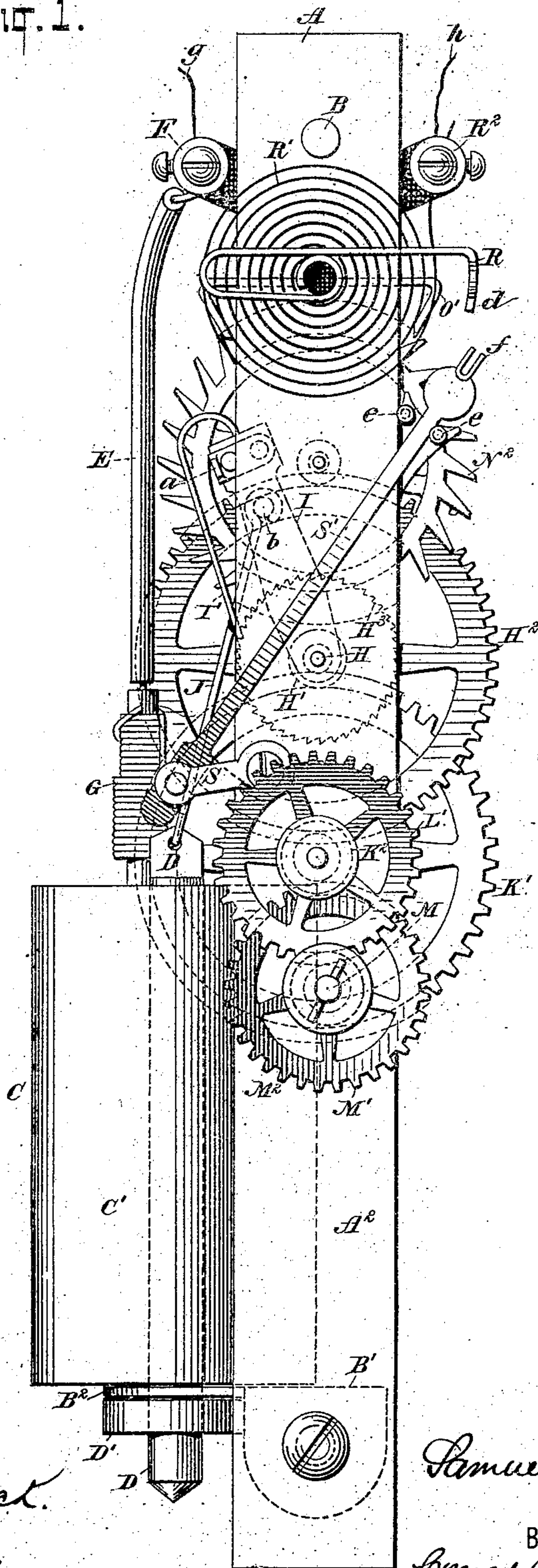


Fig. 3.

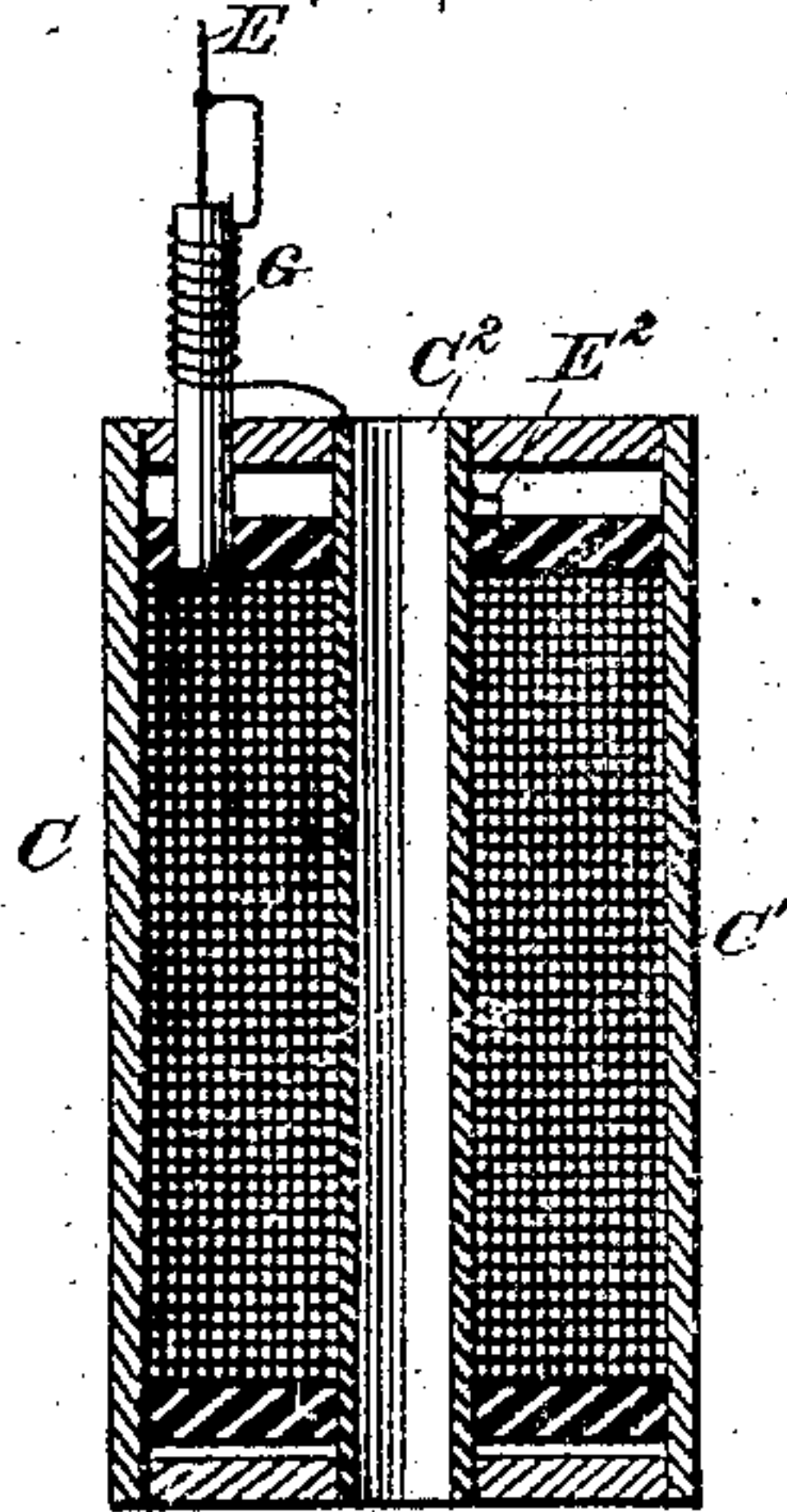
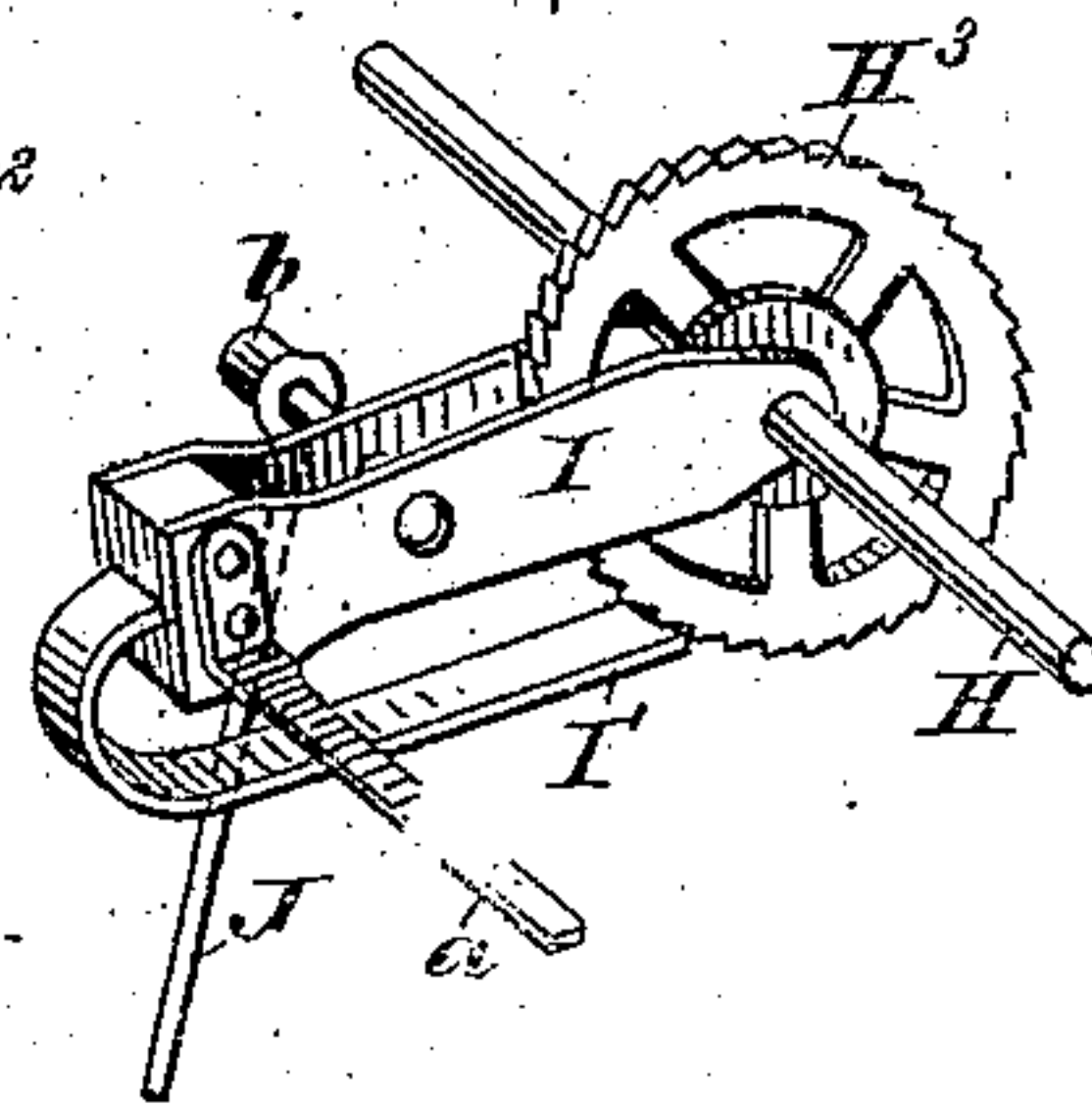


Fig. 4.



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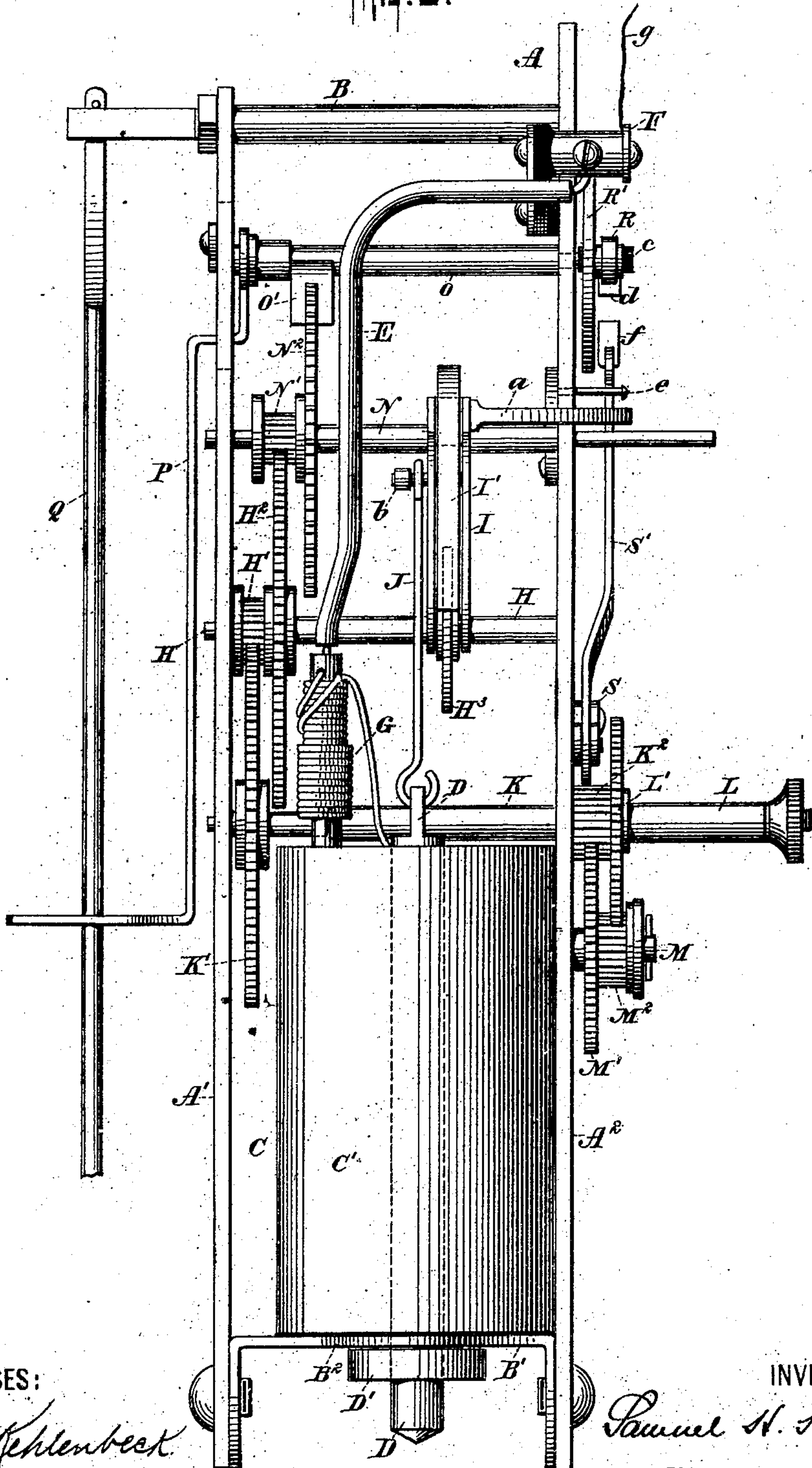
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2 Sheets—Sheet 2.

Fig. 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

SAMUEL H. HOGGSON, OF NEW YORK, N. Y.

## ELECTROMECHANICAL CLOCK.

SPECIFICATION forming part of Letters Patent No. 714,905, dated December 2, 1902.

Application filed November 27, 1901. Serial No. 83,837. (No model.)

*all whom it may concern:*

Be it known that I, SAMUEL H. HOGGSON, a citizen of the United States, residing at the city of New York, borough of Manhattan, in the county and State of New York, have invented certain new and useful Improvements in Electromechanical Clocks, of which the following is a full, clear, and exact specification.

My invention relates to improvements in motors for actuating divers forms of machinery; and said invention has for its object more particularly to provide a simple, efficient, and positive electromechanical apparatus for operating clockwork and analogous machines.

The objects above enumerated I am enabled to attain by means of my invention, which consists in the novel details of construction and in the combination, connection, and arrangement of parts, as hereinafter more fully described and then pointed out in the claims.

In the accompanying drawings, forming a part of this specification, wherein like letters of reference indicate like parts, Figure 1 is a rear view of a clock mechanism constructed according to and embodying my invention. Fig. 2 is a side view thereof. Fig. 3 is a central section of the solenoid, and Fig. 4 is a detail perspective view of the main actuating-lever and connected parts.

In said drawings, A designates the clock-frame, consisting of the plates A' A<sup>2</sup>, connected together adjacent to their upper ends by the pillar B, having a split end which extends rearwardly through the plate A'. The lower ends of the plates A' A<sup>2</sup> are united by a bracket B', having a horizontal projecting portion B<sup>2</sup>, provided with an aperture to permit of the passing of the armature of the solenoid therethrough.

Upon the bracket B' is secured a solenoid C, inclosed by a soft-steel jacket C' and having a hollow brass core C<sup>2</sup>, within which works the armature D, provided at its lower projecting end with a rubber washer or cushion D'. One terminal E of the solenoid is inclosed within an insulating-tubing and connected to an insulated binding-post F, secured to the plate A<sup>2</sup>, near its top, and the other terminal E<sup>2</sup> of said solenoid is con-

nected to the hollow brass core C<sup>2</sup>, and upon the insulated portion of the terminal E, adjacent to the top of the solenoid C, are disposed a series of convolutions of wire G, one end of which is connected to the terminal E of the solenoid and the other connected to the hollow brass core C<sup>2</sup> in order to prevent sparking at the contacts *d* and *f* and prevent the consequent burning out thereof.

Within the frame A, near its middle, is journaled a main driving-shaft H, having fixed thereon near its rear end, but within the frame, a pinion H' and a gear-wheel H<sup>2</sup>, and near the forward end of said shaft is disposed the bifurcated end of a lever I, between which is fixed a ratchet-wheel H<sup>3</sup>.

I' denotes a spring-detent having one end secured to the outer end of the lever I and its other end in engagement with the teeth of the ratchet-wheel H<sup>3</sup>. Said lever I is further provided near its outer end with a finger *a*, which extends forward beyond the front of the plate A<sup>2</sup>, and a rearwardly-projecting pin *b*, to which is pivotally connected one end of a link or pitman J, the lower end of which link or pitman is pivotally connected with the upper end of the armature D of the solenoid C.

Within the frame below the shaft H is journaled a shaft K, having a gear-wheel K' fixed thereon in mesh with the pinion H', and on its forward end, which projects through the plate A<sup>2</sup>, is fixed a pinion K<sup>2</sup>, and secured to a sleeve L, disposed upon the end of said shaft K in front of the pinion K<sup>2</sup>, is a gear-wheel L', the shaft K being adapted to receive the minute-hand and the sleeve L the hour-hand. Upon the front of the plate A<sup>2</sup> directly below the shaft K is secured a short shaft M, upon which revolves a gear-wheel M', in mesh with the pinion K<sup>2</sup>, and a pinion M<sup>2</sup>, secured to said gear-wheel M' and meshing with the gear-wheel L'.

Above the shaft H is journaled a shaft N, the forward end of which extends through the plate A<sup>2</sup> and is adapted to receive the seconds-hand. Upon said shaft N within the frame is fixed a pinion N', in mesh with the gear-wheel H<sup>2</sup>, and in front of said pinion is fixed the scape-wheel N<sup>2</sup>, and above said shaft N is journaled a shaft O, carrying the pallet O', which engages the teeth of the scape-



wheel N<sup>2</sup>. Adjacent to the rear end of the shaft O is fixed the upper end of the crutch P, the other end of which extends outward through an opening in the plate A' and its lower forked end embracing the pendulum-rod Q, suspended from the end of the pillar B.

The forward end of the shaft O is provided with a head *c*, of insulating material, upon which is secured a contact-finger R, having a platinum tip *d*, and R' denotes a helical copper conductor having one end secured to the insulated binding-post R<sup>2</sup> on the plate A<sup>2</sup> and its other end connected to contact-finger R on the insulating-head *c*, whereby the current is conducted from said binding-post R<sup>2</sup> to the contact-finger R.

Upon the front of the plate A<sup>2</sup> above the shaft K is secured a bracket S, in which is pivotally supported adjacent to its lower end a lever S', which extends diagonally upward across the plate A<sup>2</sup>, and its upper end, which is disposed between pins *e e*, projecting outwardly from the plate A<sup>2</sup>, provided with a platinum tip *f*.

From the binding-posts F and R<sup>2</sup> extend wires *g h*, which are connected to the opposite poles of a battery.

The operation is as follows: If we assume the apparatus to be in the position illustrated in Figs. 1 and 2, it simply becomes necessary to set the pendulum in motion, whereupon the armature D within the solenoid C will descend and carry with it the outer end of the lever I and cause the same to rotate the shaft H, and thereby transmit motion to train of gearing. As the armature D within the solenoid C descends it carries with it the lever I, to the outer end of which the finger *a* is secured, and as the lever I nears its lowermost position the outer end of the finger *a* will contact with the lower projecting end of the lever S'. The lever I, however, does not stop as soon as the end of the finger *a* strikes the end of the lever S', but continues to descend, owing to the weight of the armature D, attached thereto, and this causes the end of the finger *a* to bear upon the lower projecting end of the lever S' and cause its upper end to be moved inward into the path of the end of the oscillating contact-finger R and establish a circuit through the parts *d* and *f* with the first downward movement of the free end of said finger R after the upper end of the lever S' has been moved inward, as aforesaid. As soon as the parts *d* and *f* contact a circuit will be established for a very brief instant, which will immediately cause, therefore, the solenoid C to be energized and raise the armature D to its initial position and at the same time restore the lever I to its initial position, which is that illustrated at Figs. 1 and 2 of the drawings. Hereupon the operation above described will be repeated.

The course of the current when the circuit is closed through the contacts *e* and *f* is as follows: from the battery through conductor *h*, helical conductor R', finger R, lever S', plate

A<sup>2</sup>, bracket B', hollow core C<sup>2</sup>, solenoid C, shunt G, conductor E, and through conductor *h* to battery.

It will of course be understood that the contact-finger R, being fixed to the shaft O, is constantly making a partial revolution and causing the contact *d* at its end to descend to the plane of the contact *f* on the lever S', but that a circuit can only be established after the finger *a* on the lever I has moved the lower end of the lever S' inward and its upper end into the path of the finger R, and that as soon as the contact has been made and the circuit completed and the lever I restored to its initial position the upper end of the lever S' will again fall back out of the path of the finger R, and simultaneously therewith the circuit will be again broken.

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

1. The combination of a clock mechanism, with a ratchet-wheel fixed on the main driving-shaft, a lever on said shaft, a detent carried thereby engaging the teeth of said ratchet-wheel, a source of electric energy, an electromagnet in circuit therewith, an armature connected to the outer end of said lever and adapted to depress said outer end, a circuit-closing device comprising a moving contact member and a movable contact member normally out of the path of said moving contact member, and means carried by the lever aforesaid adapted to engage the movable contact member and move the same into the path of the moving contact member whereby to close the circuit when the armature has reached about its lowermost position and cause the electromagnet to raise the outer end of said lever and the armature connected thereto to their initial positions, substantially as specified.

2. The combination of a clock mechanism, with a ratchet-wheel fixed on the main driving-shaft, a lever pivoted on said shaft, a spring-detent carried thereby engaging the teeth of said ratchet-wheel, and a projecting finger secured to the outer end of said lever, a source of electric energy, an electromagnet in circuit therewith, an armature adapted to be actuated by said electromagnet and connected to the outer end of said lever, a circuit-closing device comprising a moving contact member, a movable contact member consisting of a lever pivoted intermediate its ends, and having one of its ends normally out of the path of the moving contact member, and the other normally in the path of the projecting finger of the lever, substantially as and for the purposes set forth.

3. The combination of a clock mechanism with a ratchet-wheel fixed on the main driving-shaft, a lever pivoted on said shaft, a spring-detent carried thereby engaging the teeth of said ratchet-wheel, and a projecting finger secured to the outer end of said lever, a source of electric energy, a solenoid in cir-



5 cuit therewith, a core disposed therein, a link  
connecting the upper end of said armature  
with the outer end of the lever aforesaid, a  
circuit-closing device comprising a helical  
conductor secured to the escapement-shaft  
but insulated therefrom, a contact-finger also  
secured to said shaft and connected to said  
helical conductor, a lever pivoted to the frame  
below said contact-finger having its upper end  
10 normally out of the path of said contact-fin-

ger, and its lower end normally in the path  
of the projecting finger on the lever, substan-  
tially as specified.

Signed at the city of New York, in the  
county and State of New York, this 3d day of 15  
September, 1901.

SAMUEL H. HOGGSON.

Witnesses:

JOHN KEHLENBECK,  
EDWIN H. DIETERICH.