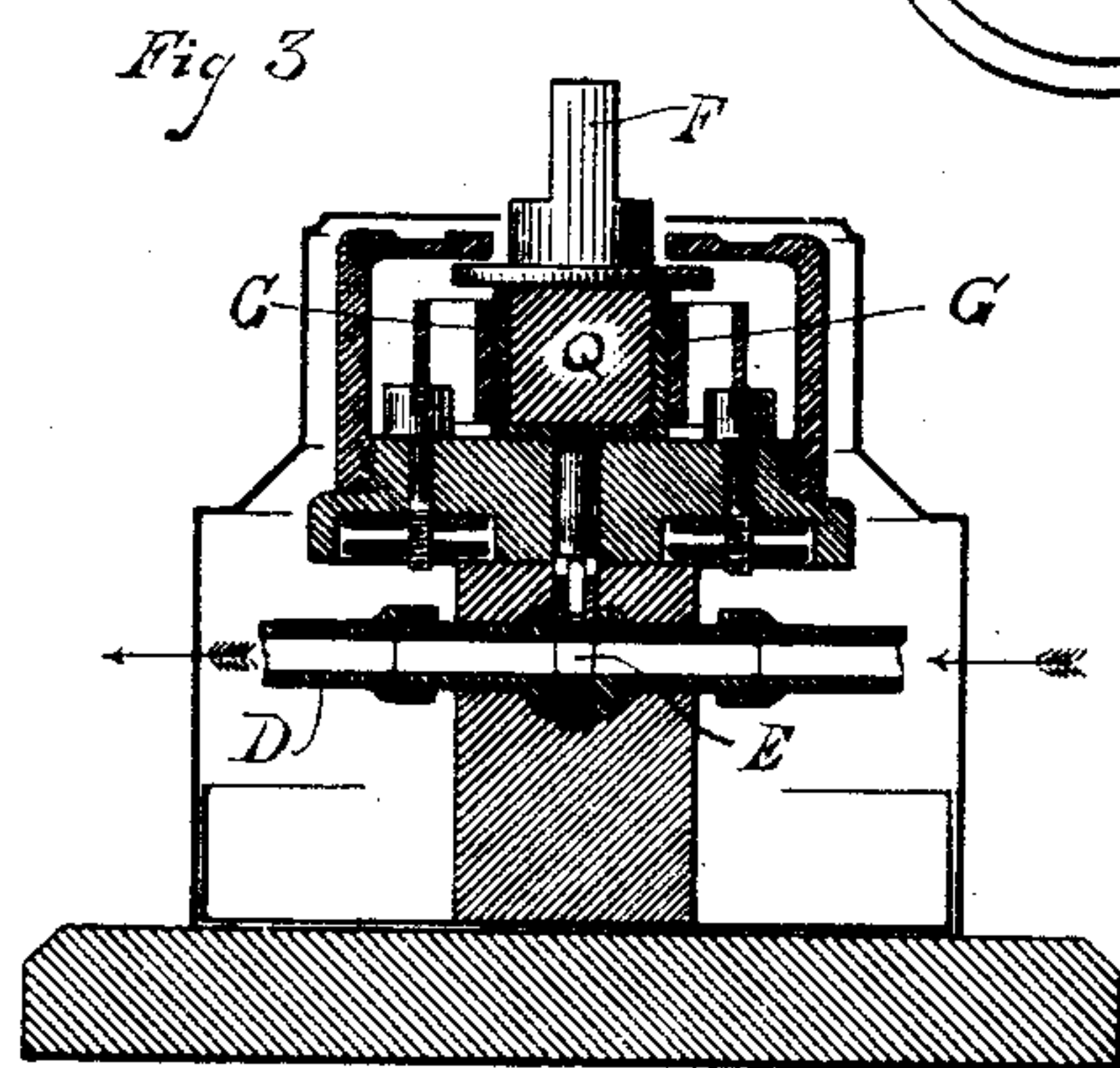
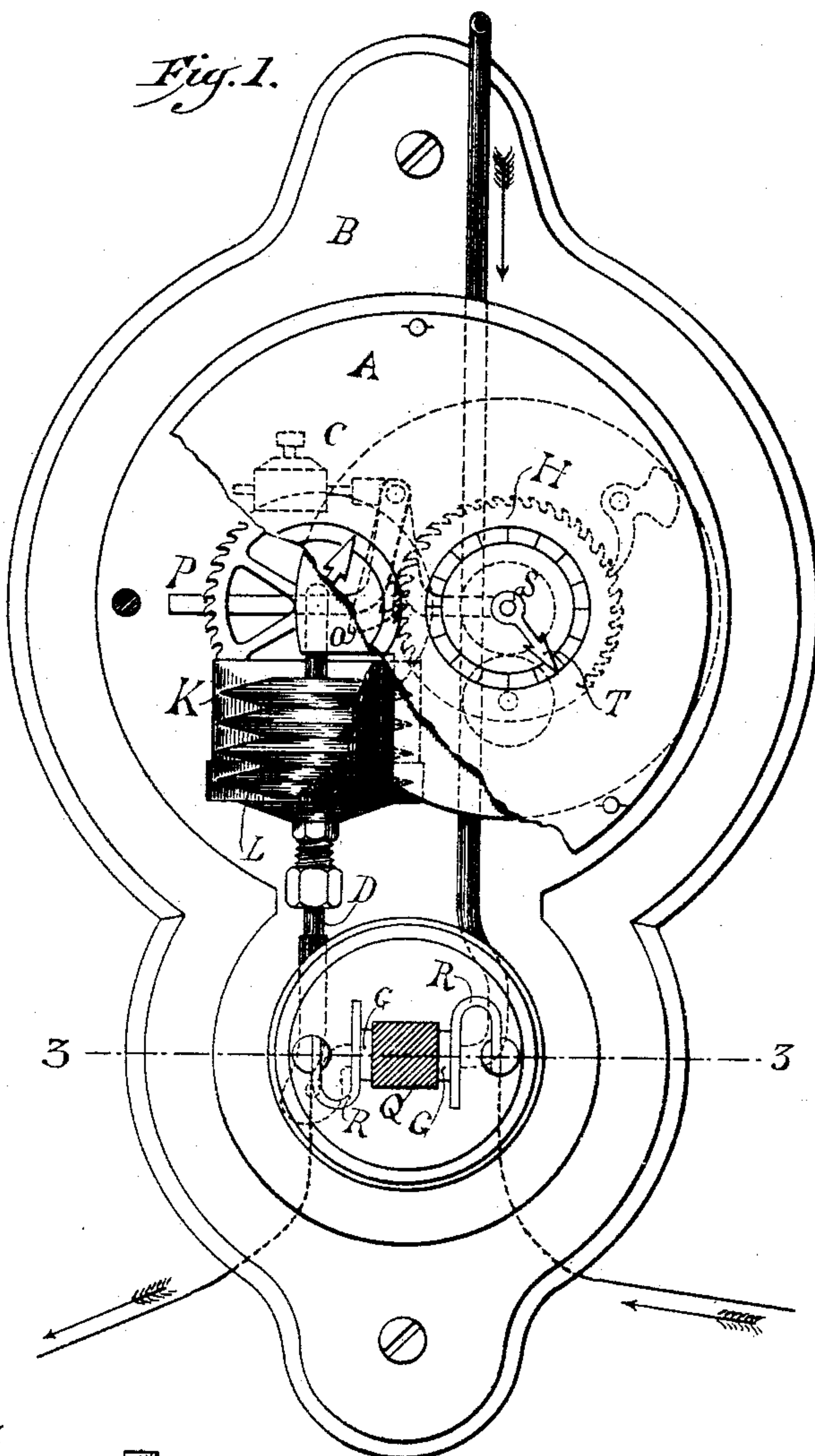
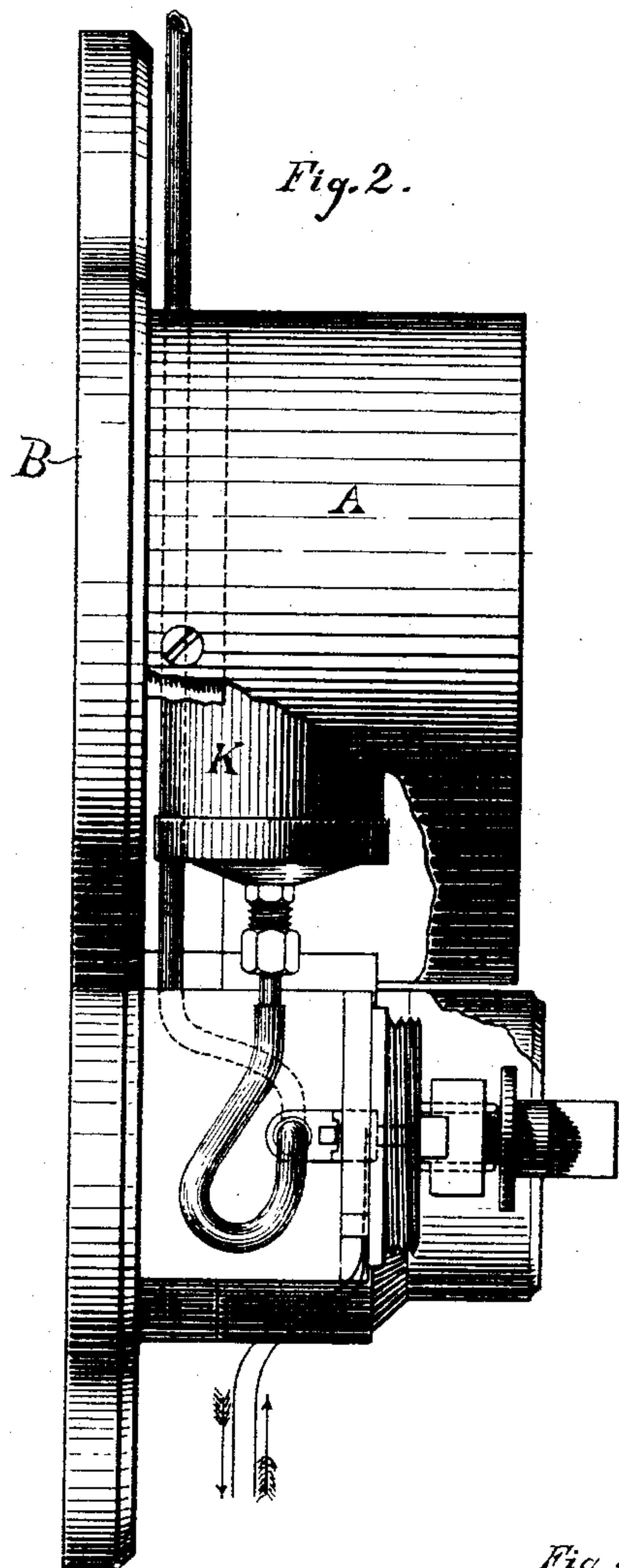


(No Model.)

V. POPP.  
ELECTRO PNEUMATIC CLOCK.

No. 438,767.

Patented Oct. 21, 1890.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

VICTOR POPP, OF PARIS, FRANCE, ASSIGNOR TO THE POPP COMPRESSED AIR AND ELECTRIC POWER COMPANY, LIMITED.

## ELECTRO-PNEUMATIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 438,767, dated October 21, 1890.

Application filed April 7, 1888. Serial No. 269,990. (No model.) Patented in France November 11, 1887, No. 186,823; in England November 18, 1887, Nos. 15,878, 15,878A, and 15,878B; in Germany December 24, 1887, Nos. 44,745 and 47,546; in Belgium May 7, 1888, No. 81,725, and in Italy June 30, 1888, XLVI, 247.

*To all whom it may concern:*

Be it known that I, VICTOR POPP, a citizen of the Republic of France, residing at the city of Paris, France, have invented certain new and useful Improvements in Registers for Electric Circuits, of which the following is a specification.

This invention is embodied in patents of the following countries: in France, dated November 11, 1887, No. 186,823; in England, dated November 18, 1887, Nos. 15,878, 15,878A, and 15,878B; in Germany, dated December 24, 1887, Nos. 44,745 and 47,546; in Belgium, dated May 7, 1888, No. 81,725, and in Italy, dated June 30, 1888, No. 247, Vol. XLVI.

My invention relates to a pneumatic register for electric circuits; and it consists in the combination, with a switch for closing an electric circuit, of a pneumatic clock or registering device which is constantly operated from an independent supply of compressed air, and which is provided with a cock attached to the switch, so that the air is admitted to the device simultaneously with the closing of the electric circuit.

In the accompanying drawings, illustrating my invention, Figure 1 is a front elevation of the apparatus, partly in section. Fig. 2 is a side elevation, partly in section; and Fig. 3 is a section through the line 3 3, Fig. 1.

The pneumatic clock or registering device is similar in construction to that shown in my patent, No. 275,701, dated April 10, 1883, and will be completely understood by reference to said patent.

In the drawings, A represents the inclosing case attached to a base-board B.

K is a cylinder, in which is a small bellows L, connected with the supply-pipe D for the compressed air. The free end of this bellows is connected with lever P, pivoted at S. Upon a projection from P is pivoted a pawl O, which by means of weight C is held in engagement with toothed wheel H. The wheel H engages with a train of wheels actuating the registering device T.

As is set forth in my above-mentioned patent, a periodic impulse of compressed air is transmitted to the device from a central supply. Each impulse expands bellows L, which

acting through the mechanism described advances the register T a definite distance.

E is a cock in the pipe D, turned by the key F. Upon the spindle of this cock is the switch for closing the electric circuit. This switch consists of the contact-plates G upon opposite sides of a squared place Q on the spindle, which are in electrical connection with each other, and which rest against the corresponding springs R, the terminals of the circuit, and complete the electrical connection. The other two sides of this squared place on the spindle are of insulating material Q. When a quarter-turn is given to the spindle, the cock E is closed, and at the same time the springs R rest against the insulating sides of the spindle and the circuit is interrupted. By this means the switch which admits current to the electric circuit at the same time admits air to the registering device, and the air and current will be simultaneously shut off from the device, and there will be no action of the register unless the current is passing. The time during which the current is used will thus be accurately recorded.

I claim—

1. The combination, with an electric circuit, of apparatus therein, the operation of which it is desired to register, a switch controlling the circuit, a pneumatic registering device consisting of a step-by-step movement actuated by periodical impulses of compressed air from an external source, and a cock placed in the supply-pipe of the said registering device and connected to the said switch, whereby the operation of the apparatus in the electric circuit may be automatically registered.

2. The combination, in a pneumatic registering device for an electric circuit, of a supply-pipe, a bellows or piston connected thereto, a pawl-and-ratchet movement actuated by the piston or bellows, a register driven by said movement, a cock in the said supply-pipe, and a switch connected to said cock and controlling an electric circuit.

VICTOR POPP.

Witnesses:

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