

(No Model.)

A. L. JOYNES.  
STRONG CURRENT PROTECTOR.

No. 551,388.

Patented Dec. 17, 1895.

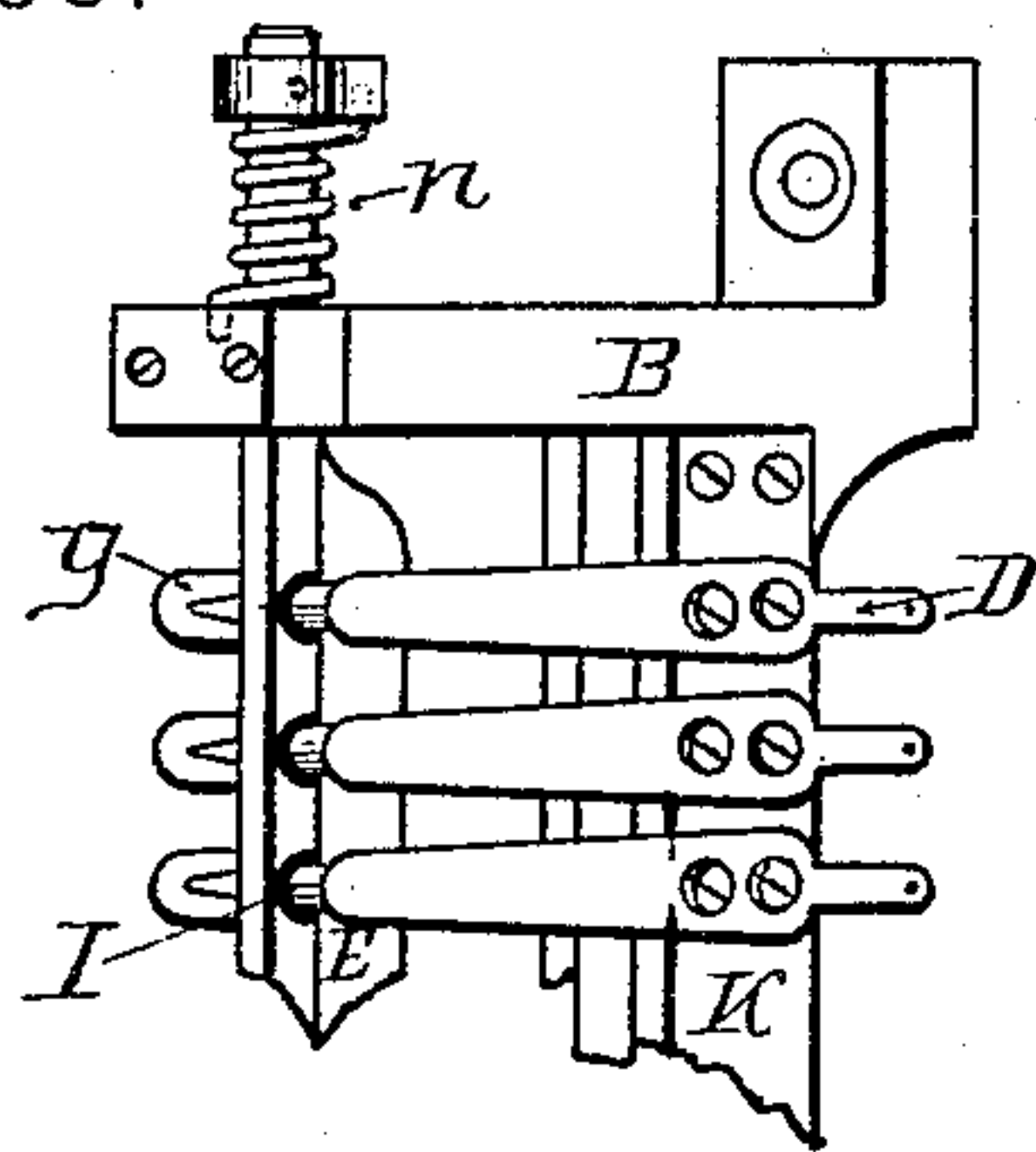


Fig. 1.

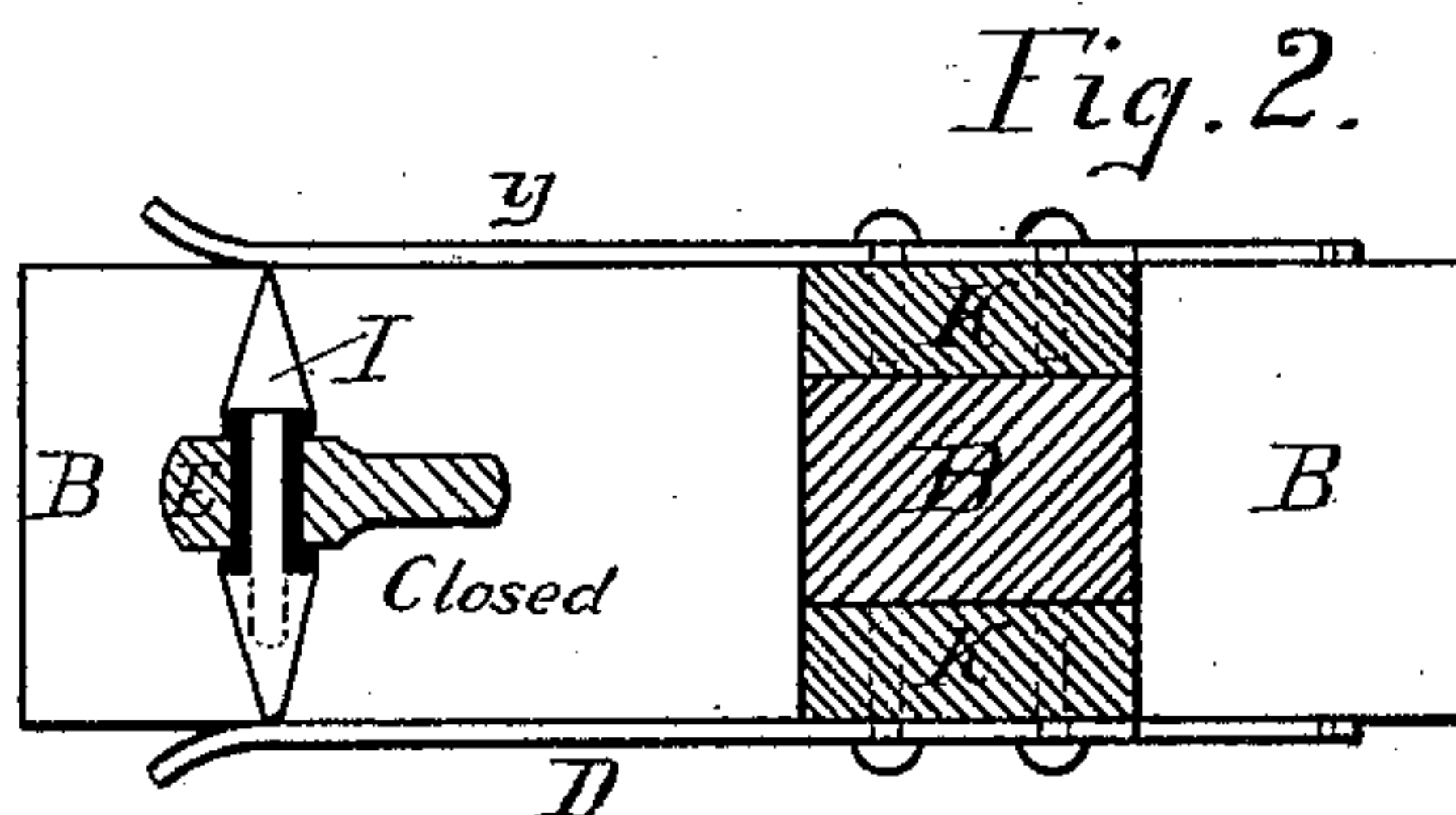


Fig. 2.

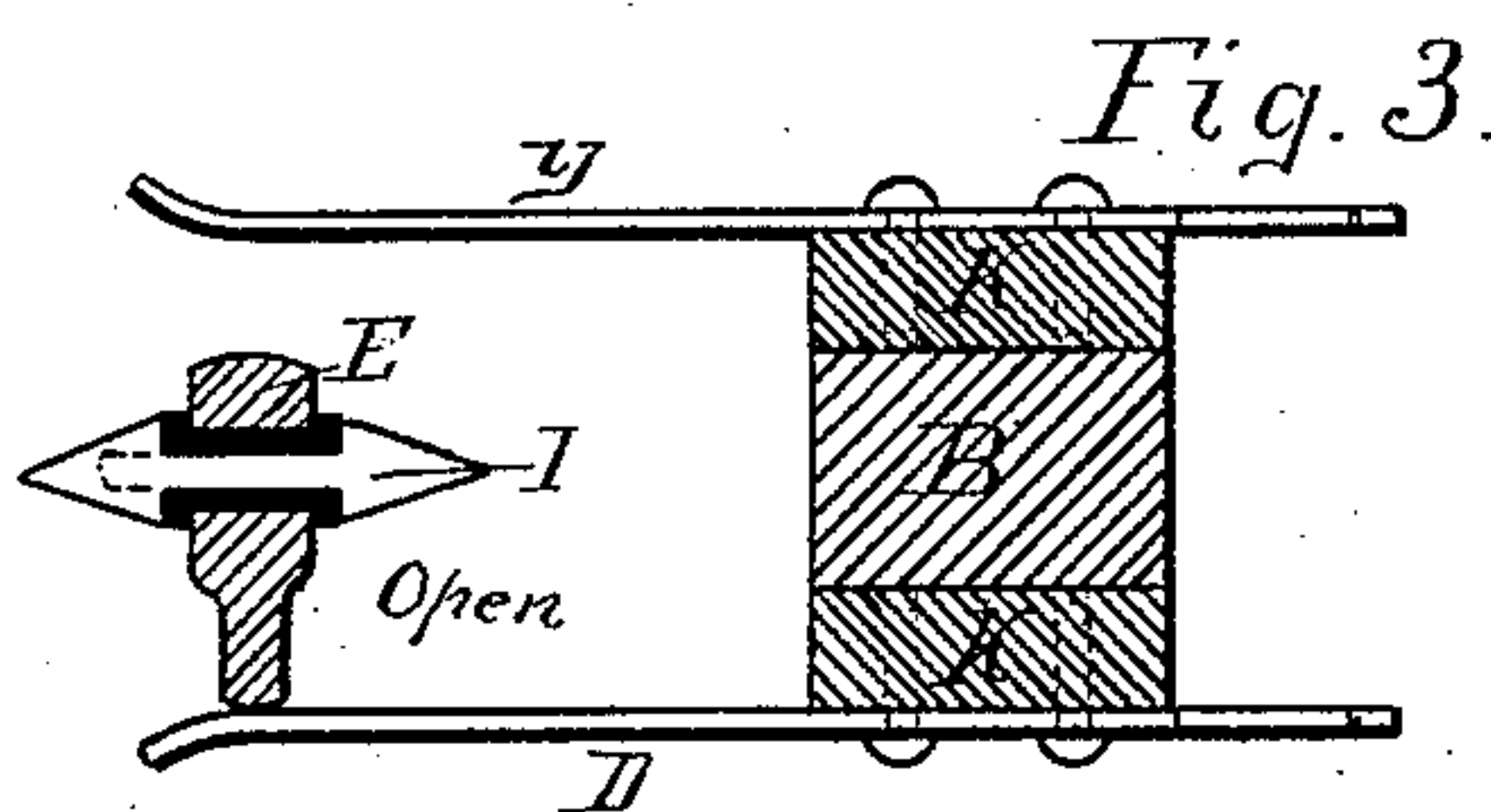
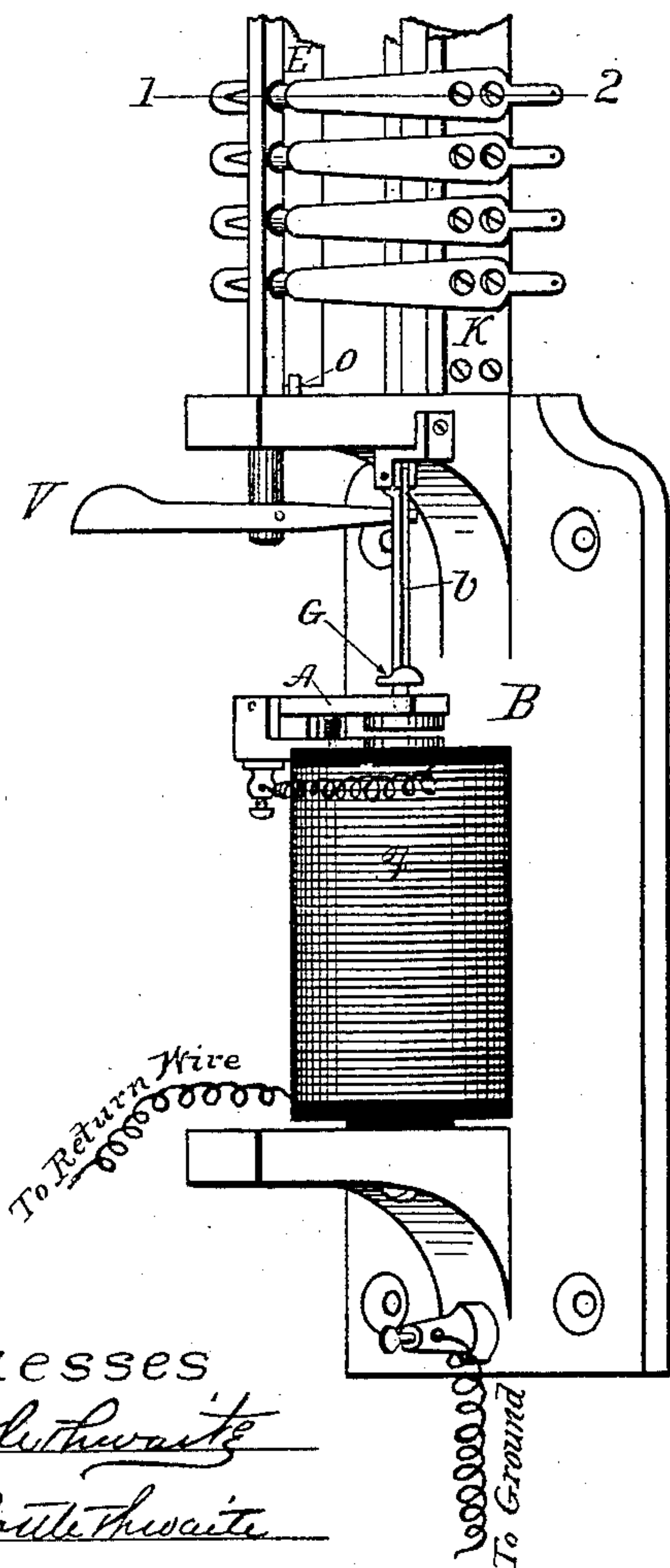


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

ADRIAN L. JOYNES, OF PADUCAH, KENTUCKY.

## STRONG-CURRENT PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 551,388, dated December 17, 1895.

Application filed January 9, 1895. Serial No. 534,409. (No model.)

*To all whom it may concern:*

Be it known that I, ADRIAN L. JOYNES, a citizen of the United States, residing in Paducah, State of Kentucky, have invented a new and useful Lightning-Arrester and Strong-Current Protector for Telephone-Exchanges, of which the following is a specification.

My invention relates to improvements in lightning-arresters and strong-current protectors for telephone-exchanges.

In telephone-exchanges the wires are divided into different routes, each route to cover a certain street or part of the city. All the line-wires after entering the telephone return to the central office on a copper ground return, using a separate ground return-wire for each route; and the object of my invention is to automatically disconnect (by opening the line-wires and ground return) any one of these routes when they become heavily charged with electric current. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a perspective of my apparatus complete. Fig. 2 shows a cross-section on the line 1 2 in Fig. 1, to show more clearly the construction of the parts. Fig. 3 shows a cross-section on the line 1 2 in Fig. 1, to show the position of rod E when turned and the line-wires are opened.

B represents a metal frame with bracket at bottom for magnet F, and two other brackets with holes or eyes to receive shafts of intermediate rod E, all in electrical connection with the earth.

K is a hard-rubber strip to insulate spring-fingers from brass frame B.

Y is a spring-finger in electrical connection with the subscriber's telephone line-wire, and D is a spring-finger in electrical connection with the switchboard, and both adapted to bear on end of insulated pin I in intermediate rod E.

E is an intermediate rotating rod turning on its shafts between spring-fingers Y and D, and adapted to make and break connection between said spring-fingers.

N is a spiral spring adapted to turn rod E.

O is a stop-pin to stop rod E, so its edge

will be in contact with spring-fingers D when open.

F represents an electromagnet adapted to release rod E.

A is an armature adapted to break connection at G.

V is a cam-lever adapted to hold rod E from turning.

Having thus described the various parts of my apparatus I will now describe its operation, which is as follows:

The return-wire is brought into the office and grounded on frame B through magnet F, armature A, and cam V. The overcharging of any wire on the route will charge the return-wire, and magnet F draws armature A downward, which breaks the connection at G and allows rod E to turn on its shafts until stopped by the stop-pin O, as shown in Fig. 1, thereby breaking the circuit in all the line-wires and return-wire. When the route is entirely disconnected from the central office it has no ground connection, and grounded currents, such as street-car currents, &c., cannot damage the instruments. As will be seen by Fig. 3, when the route is open the spring-fingers D are grounded on the edge of rod E, and subscribers from other routes who may be connected with a route when it suddenly opens will not be left open. The automatic releasing of rod E may be varied by using a fuse-wire to hold it in position and release it when it is burned, but I prefer to use the magnet for the reason that it affords a simple means of restoring the rotating rod to its former position.

I am aware that magnets have been used for automatic release and at the same time to break a circuit on its armature. I do not therefore claim these features broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a strong current protector the combination of electric conducting line strips (Y and D), an insulating body (K), a body B in electrical connection with the earth, an intermediate body (E) carrying insulated connecting pins (I) adapted to make and break connection between electric conducting line



strips, an electro-magnet arranged to control the intermediate body, thereby to automatically disconnect or open all the wires in one route from wires in other routes and from  
5 central office upon the overcharging of any one of them substantially as described.

2. A combination in a lightning arrester of screws "J" acting as a lightning arrester

with the grounded frame "B" and holding spring-strips "Y" and "D" to their proper positions all substantially as set forth.

A. L. JOYNES.

Witnesses:

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OSCAR KAHN.