

(No Model.)

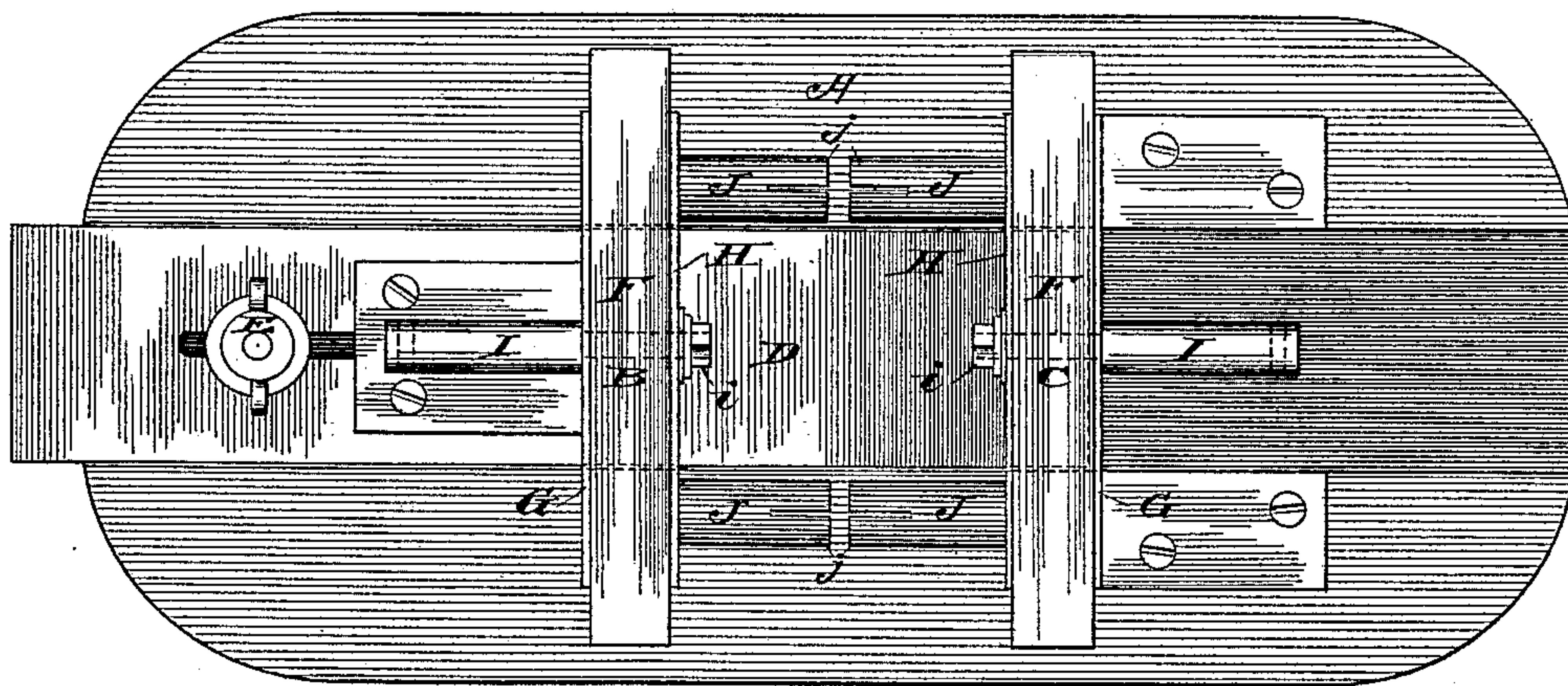
2 Sheets—Sheet 1.

A. L. COURTRIGHT.  
LIGHTNING ARRESTER.

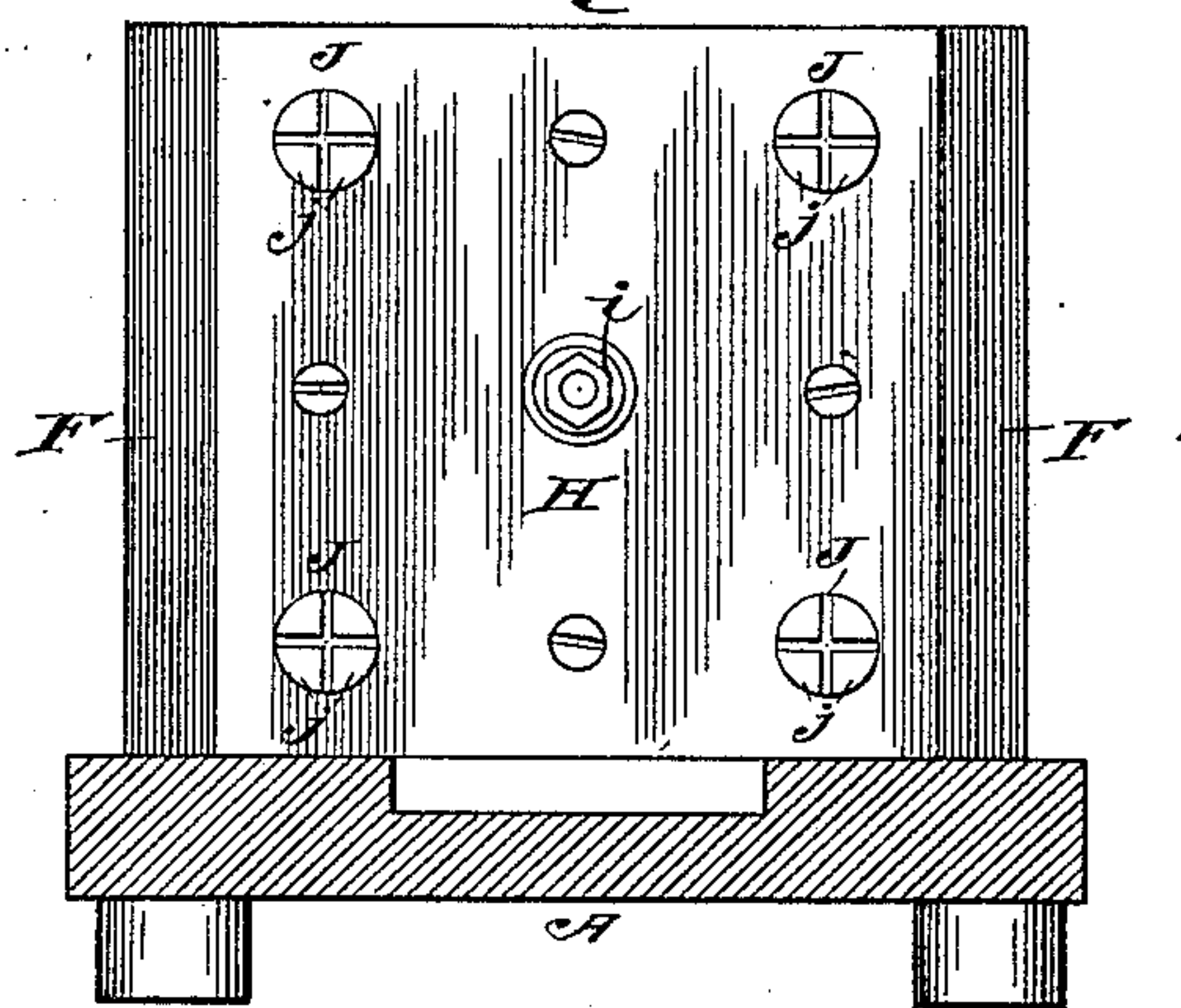
No. 525,840.

Patented Sept. 11, 1894.

*Fig. 1.*



*Fig. 2.*



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Archibald L. Courtright  
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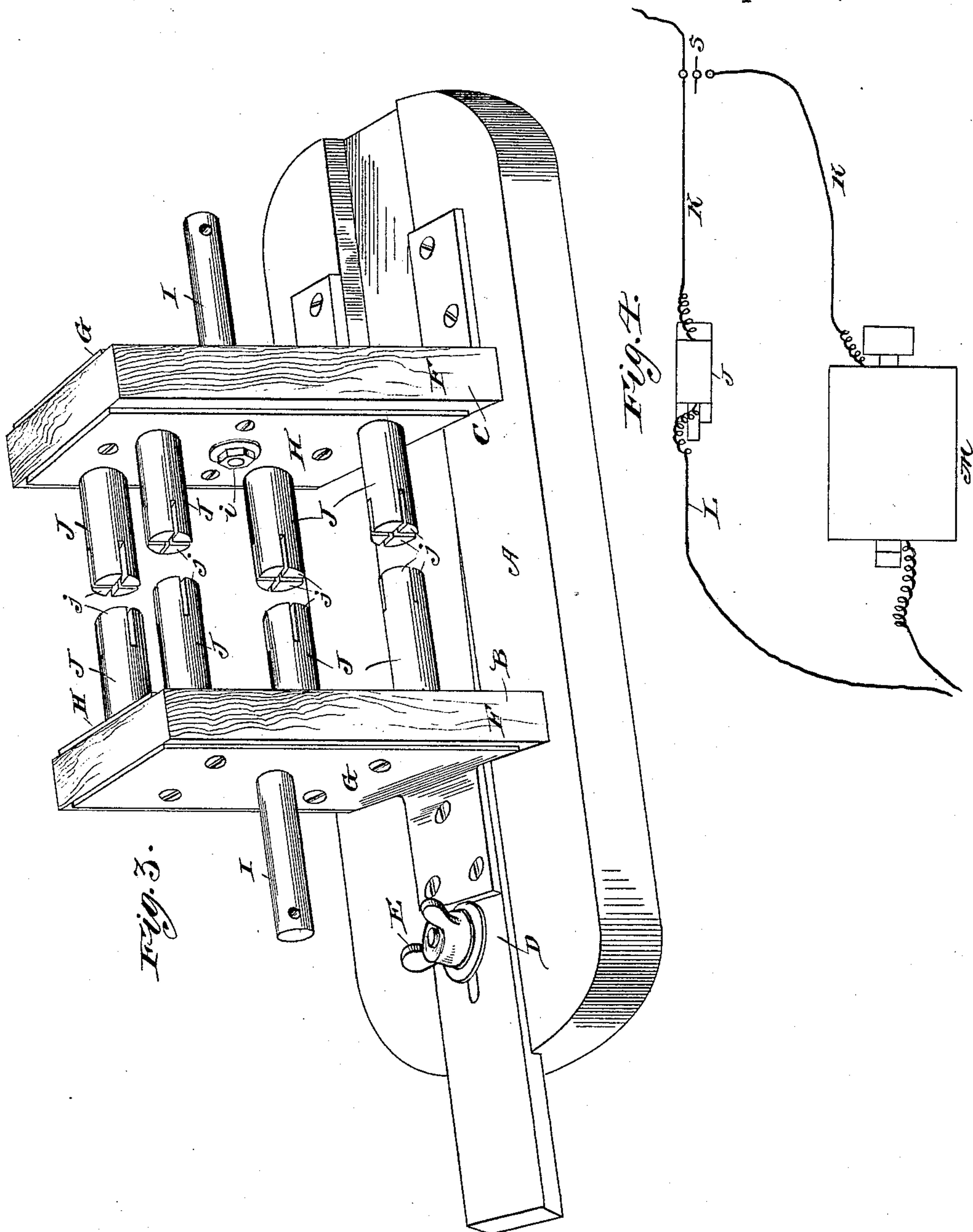
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

ARCHIBALD L. COURTRIGHT, OF KEOKUK, IOWA.

## LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 525,840, dated September 11, 1894.

Application filed February 1, 1894. Serial No. 498,778. (No model.)

*To all whom it may concern:*

Be it known that I, ARCHIBALD L. COURTRIGHT, of Keokuk, Iowa, have invented certain new and useful Improvements in Lightning-Arresters, of which the following is a specification.

This invention relates to a method and means for automatically controlling an electric circuit. The means consists of a valve which is capable of adjustment so that it may be set to operate by variations in the current from a given electro-motive force. The valve may be employed as a protector of mechanical apparatus; for example, in a circuit having a number of motors or dynamos.

In the accompanying drawings, Figure 1 is a plan view of the valve. Fig. 2 is a transverse sectional elevation. Fig. 3 is a perspective view; and Fig. 4 is a diagram showing the valve included in a circuit having a motor therein.

There is embodied in the construction of the valve a suitable base A, having mounted thereon two like sections B, C. The section B is adjustably mounted upon a slide D, which may be fixed in any desired position by the set screw E. Each section of the valve is composed of a block F of non-conductive or insulating material, an outer metallic plate G, an inner metallic plate H, preferably copper, and a binding post I.

J represents electrodes which may be of carbon, cylindrical in form, and inserted in apertures in the plate H and non-conducting block F, and they will be insulated from the block F but in contact with the plates G and H. Binding posts I are secured by nuts *i* on the inner face of the plate H and serve to bind the various parts together, and also to form connections for a feed wire K and for the ground wire L.

In the diagram shown in Fig. 4, the valve is interposed in a circuit formed by the wires K, L and motor M, and which circuit is controlled by a switch S. The projected ends of the electrodes are bisected at right angles forming four points *j* on each electrode, and the air dielectric is formed around and between these points. The number of electrodes in each section of the valve is estimated and varied according to the amount of tension or electro-motive force. The greater the elec-

tro-motive force the greater number of electrodes are placed in each section of the valve. Both of the valve sections may be adjustably mounted and they are so arranged that the points of the electrodes may be brought into perfect contact or separated to any desired extent.

When it is desired to maintain a constant circuit of a given electro-motive force and current, then the points of the electrodes are brought into contact; and for the purpose of enabling the valve to automatically control the circuit, the points of the electrodes may be separated to the required distance and maintained in the set position by the set screw. When thus separated the air dielectric around and between the bisected points of the electrodes is of a practically constant ohmic force. When the electro-motive force exceeds that for which the valve is set, the current will arc over the space between the opposing points of the electrodes, overcoming the air dielectric, and upon a decrease of the current to or below the given electro-motive force the air dielectric asserts itself, the current is stopped and the circuit is broken. Thus any excess of electric-motive force produces an arc in the valve circuit, and the current passing through the motor or other apparatus on the line is uniform. The length of the arc is equal to the circuit of the air dielectric, and the maximum tension of the air dielectric is ten seventy-sixths of an ohm to the square centimeter. Therefore, when the points of the electrodes are separated a distance of one millimeter, the length of the arc will be one millimeter, and the arc is so short and is maintained for so brief a space of time that the electrodes are not consumed. In practical use the valve will be set to a less resistance than the apparatus which it is designed to protect, and therefore the excess of current will pass through the valve.

The mechanical construction may be considerably varied without departing from the scope of the invention, and I do not therefore limit myself to said mechanical construction except as hereinafter pointed out in the claims.

I claim—

1. An electric difference of potential valve, comprising in combination two similar sec-

tions, one of which is adjustable with relation to the other and each section composed substantially of a block or base of non-conducting material, copper plates secured on each side thereof, a binding post projected through the copper plates and insulating material with means for securing it therewith and electrodes in contact with both of said copper plates, substantially as described.

10 2. An electric difference of potential valve, comprising in combination two similar sections, one of which is adjustable with relation to the other, and each section composed sub-

stantially of a block or base of non-conducting material, plates of conducting material 15 secured on each side of said base, a binding post projected through the plates and base and means for securing the parts together, and electrodes in contact with both of the plates, said electrodes having their points bisected, substantially as described. 20

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