

No. 677,519.

Patented July 2, 1901.

F. W. JONES.

PROTECTION OF MULTIPLE TELEGRAPH INSTRUMENTS.

(Application filed Feb. 13, 1899.)

(No Model.)

Fig. 1.

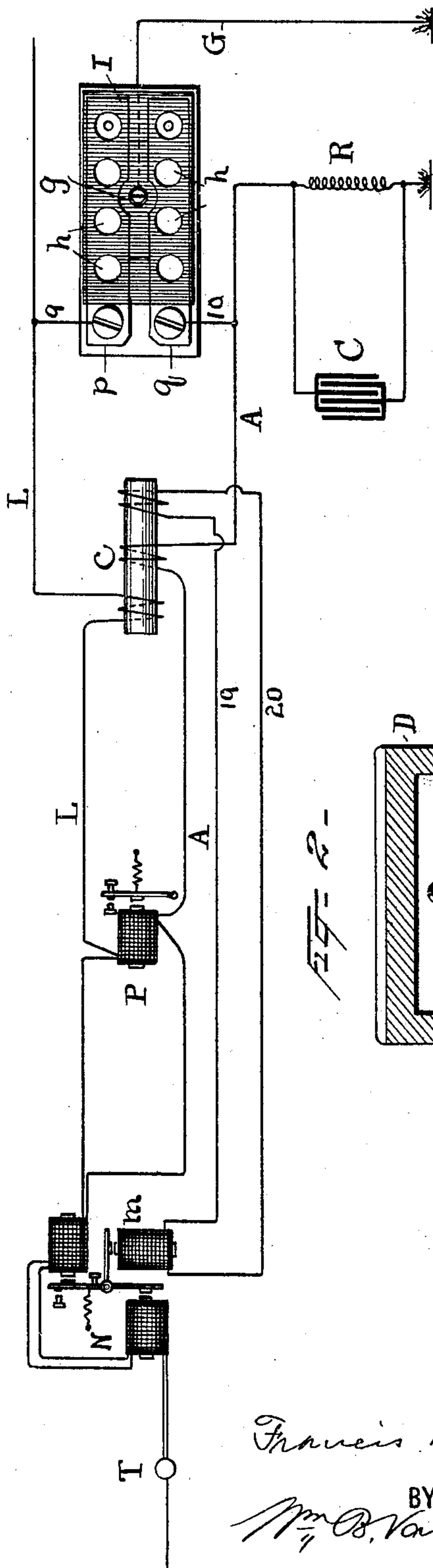
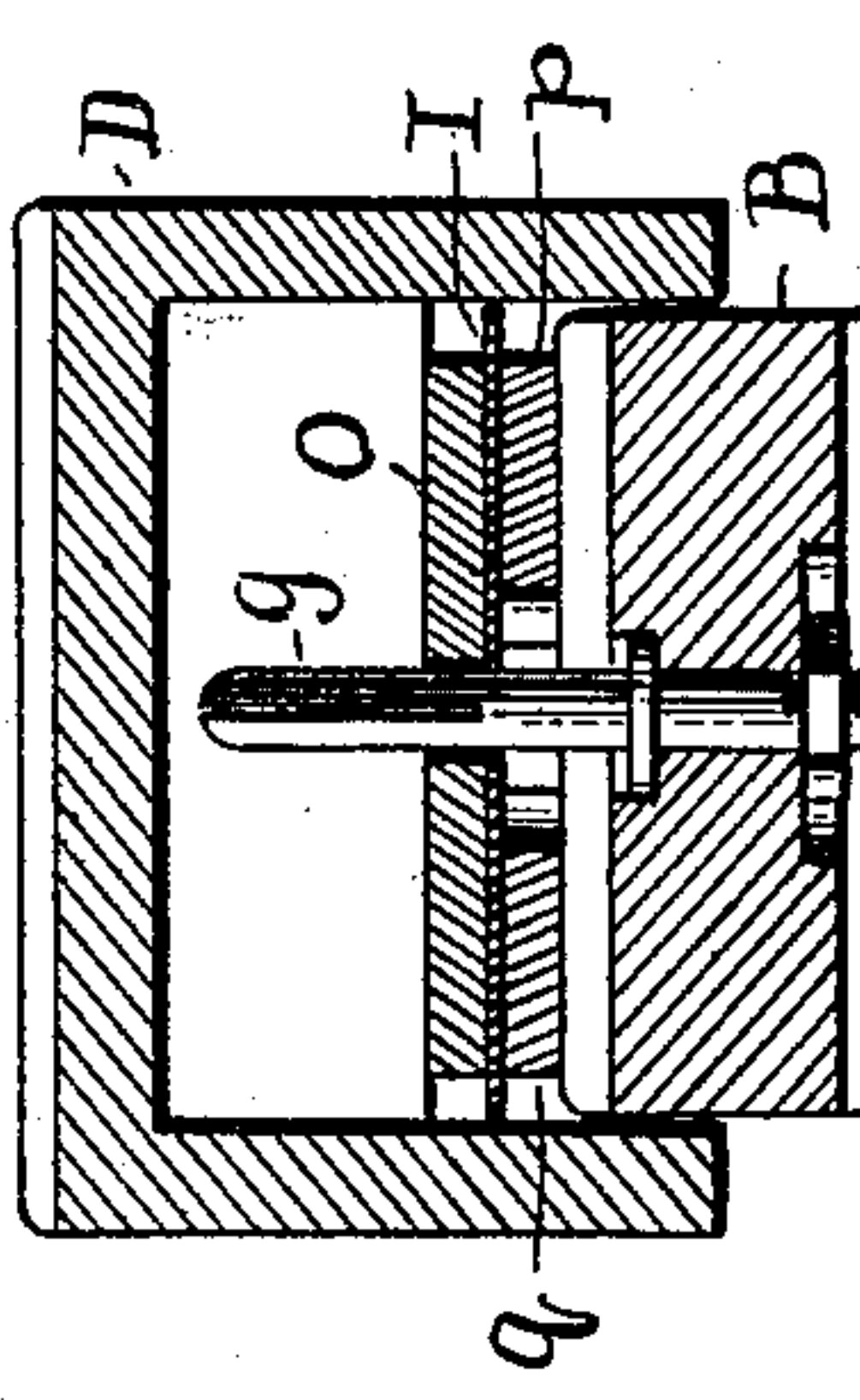


Fig. 2.



WITNESSES:

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PROTECTION OF MULTIPLE-TELEGRAPH INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 677,519, dated July 2, 1901.

Application filed February 13, 1899. Serial No. 705,394. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. JONES, a citizen of the United States, residing in the city, county, and State of New York, have made certain new and useful Improvements in the Protection of Multiple-Telegraph Instruments from Lightning, of which the following is a specification.

Multiple-telegraph instruments, such as relays, have two parallel windings of fine silk-insulated wire. One winding is connected into an artificial line and the other winding into the natural line. These two circuits have substantially the same resistance and capacity. A discharge of atmospheric electricity results from a disturbance in the atmosphere producing a corresponding disturbance in the electrical condition of the earth's surface.

My improvement provides a lightning-arrester located at a neutral point as regards the transmitted currents and permits a degree of separation between line and ground plates absolutely impracticable in any arrangement heretofore known, while at the same time the instruments are thoroughly protected by a sensitive arrester and operate in the nature of "choke-coils" to retard the inflowing atmospheric discharge.

The accompanying drawings illustrate my invention.

Figure 1 is a complete view of the lightning-arrester connected in position between the main and artificial lines. Fig. 2 is a cross-section of the lightning-arrester, showing the relative position of the various parts.

L is the main line.

A is an artificial line, and R an adjustable resistance.

C is a condenser.

By the use of R and C the artificial line A is given the same resistance and capacity possessed by the natural line L.

N is a neutral relay. P is a polarized relay. Both relays have separate coil-windings upon a single core. A discharge of atmospheric electricity will break down the insulation between adjacent coil-sections and destroy the instrument.

c is an induction-coil having three windings, one in the line L, one in the line A, and one in the circuit 19 20 with the extra coil *m* of the relay N. The function of this coil in duplex telegraphy is to bridge the interval of no magnetism during reversals. The transmitting-dynamo is connected to the point T.

Let us assume that it has four hundred volts electromotive force. When this potential is directed to the line, corresponding points in the line L and A outside the instruments described have the same potential and polarity.

The lightning-arrester employed by me consists of a base B of vitreous insulating material. Upon its surface there are brass plates *p* and *q*. Located centrally between these plates is a post *g*, connected with the earth by a ground-wire G. The plate *p* is connected to the natural line L by the wire 9. The plate *q* is connected to a corresponding point in the line A by the wire 10.

o is a brass plate fixed to the vitreous cover D. It is centrally perforated to closely surround the post *g*. Between the plates *o* and *p q* is a sheet of isinglass I, having a series of perforations *h*. I is extremely thin—say three one-thousandths of an inch.

The connection of the two conducting-surfaces *p* and *q* to the main and artificial lines, respectively, permits the use of a thinner dielectric or sheet of insulating material I between the two line-plates and the grounded surface than would be the case were the plate *q* connected to the artificial line not present. It has always been necessary to employ a thicker sheet of insulating material in the position of the sheet of mica I than was desirable, because of the high potential of the outgoing dynamo-current, usually four hundred volts or more. The use of a thinner sheet I therefore protects the instruments from atmospheric discharges to a greater extent, and the use of this thinner sheet is made possible by the arrangement of the two surfaces connected to the main and artificial line, as shown and described.

What I claim, and desire to secure by Letters Patent, is—

In a multiple telegraph, the combination of one or more receiving instruments equipped with two coil-sections each, a main line, an artificial line, a lightning-arrester having two separate parallel plates or connections; a grounded contact-plate equidistant with respect to the first-named plates or connections and an electrical connection between the first-named plates and points of equal potential in the main and artificial lines, respectively.

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Witnesses:

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