

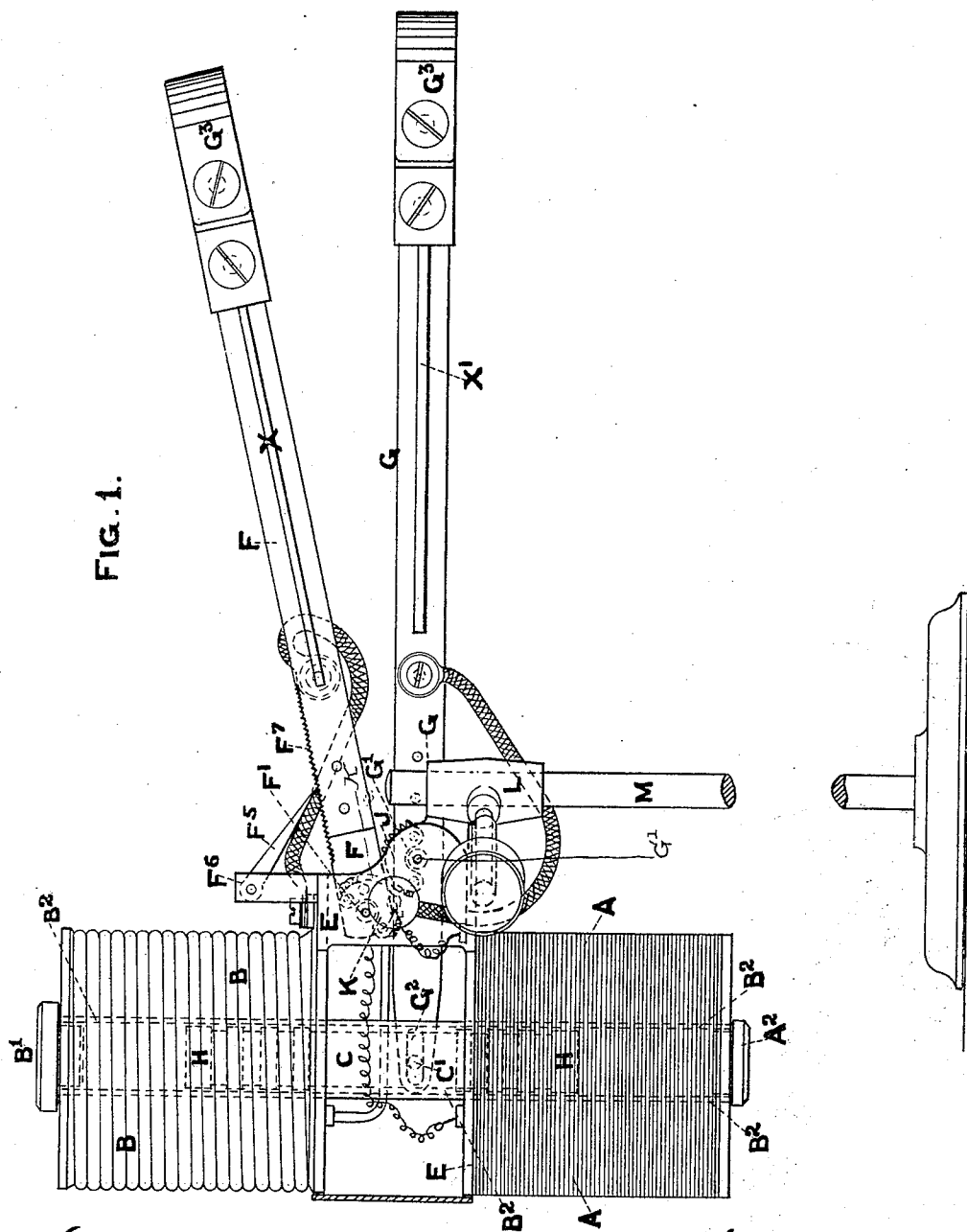
(No Model.)

2 Sheets—Sheet 1.

F. J. BORLAND.
ELECTRIC ARC LAMP.

No. 552,982.

Patented Jan. 14, 1896.



Witnesses
Herbert Dunn
Jabez Bullus

Inventor
F. J. Borland

(No Model.)

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FIG. 2.

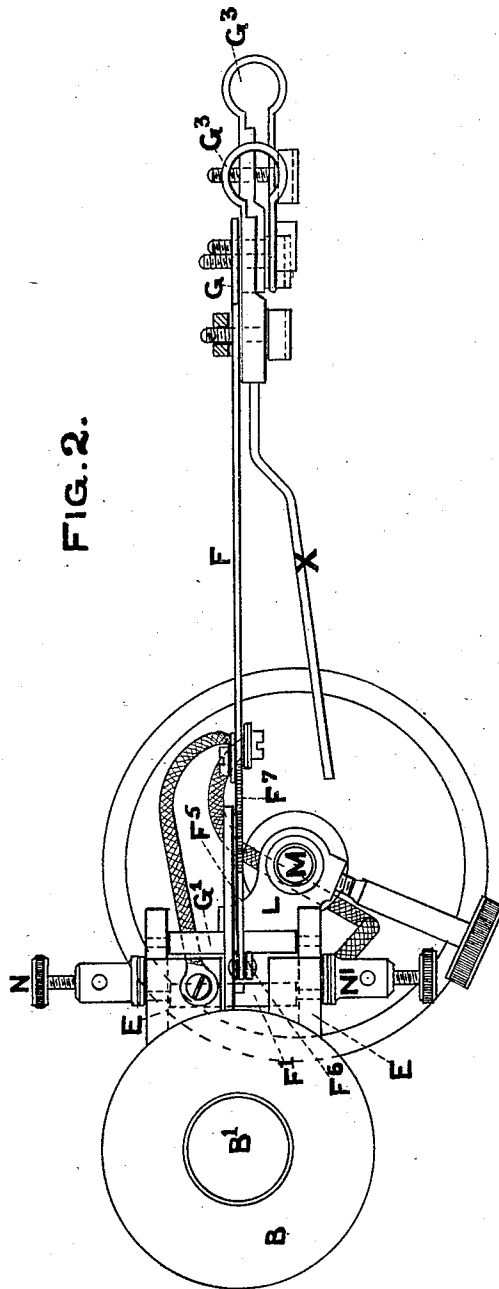
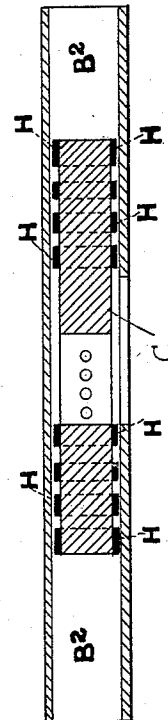


FIG. 3.



Witnesses
Herbert Dume
Jabery Bullus

Inventor
F. J. Borland

UNITED STATES PATENT OFFICE.

FREDERICK J. BORLAND, OF LEEDS, ENGLAND.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 552,982, dated January 14, 1896.

Application filed August 17, 1894. Serial No. 520,605. (No model.) Patented in England June 27, 1893, No. 18,115.

To all whom it may concern:

Be it known that I, FREDERICK JOHN BORLAND, a subject of the Queen of Great Britain, residing at Leeds, in the county of York, England, have invented certain new and useful Improvements in Electric-Arc Lamps, (for which I have obtained a patent in Great Britain, No. 18,115, dated June 27, 1893,) of which the following is a specification.

My invention consists of certain improvements in electric-arc lamps, such being specially applicable for projecting purposes.

In the drawings, Figure 1 is a side elevation of an arc lamp according to my invention. Fig. 2 is a plan of Fig. 1. Fig. 3 is a detail sectional elevation of the core shown in Figs. 1 and 2.

According to my invention I employ shunt and series coils or solenoids A and B mounted or wound on a tube or hollow spindle B², which is supported by the framework E, (serving for the support of lamp and bearings for levers.) The central spindle B² is closed at one or both ends by means of stoppers A' and B', thereby forming a cylinder or cylinders. Working within the said tube or hollow spindle B² is a central core C which acts as a piston in a cylinder and forms a "dash-pot."

On the framework E are pivoted arms or levers F and G by means of axles F' and G'. One of the levers or arms (in this case G) passes through a slot in the said tube or hollow spindle and is slotted at G² and joined to the central core C by means of a pin C' passing through the said core, which is slotted to receive the said lever G. The said central core C may be provided with annular rings or grooves H to make it more air-tight with the tube or hollow spindle B².

The lower carbon lever or arm G has a wheel or toothed segment J which gears with another wheel or toothed segment K upon the top carbon lever or arm F. A pawl F⁵ pivoted to a bracket F⁶ fixed on the framework E gears with teeth F⁷ upon the upper lever or arm F. The object of this is to prevent "pumping" or vibration of the said levers or arms. The said frame E also carries a socket L for fixing the apparatus upon a suitable

stand M when it is placed in working position and terminals N and N' for connecting or joining the wires. The clamps or carbon-holders G³ of the carbon levers or arms are made so that they can be turned to bring the carbons to any required angular position during the working by means of tilting levers X X'.

The action is as follows: The current entering the series coil or solenoid B attracts the central core C connected to lever G and the arc is struck. As the arc lengthens the current in said coil or solenoid diminishes. At the same time the current in the shunt coil or solenoid A increases, causing a pull on the core C and so shortens the arc. The joint action of the two coils or solenoids causes the carbons to approach. By means of the said tilting levers the carbons may be set for projecting purposes at any required angle and in any position during the working.

What I claim is—

1. The combination, with a support E, a shunt coil A and a series coil B secured to the said support, a tubular spindle passing through the said coils, and a central core slidable in the said spindle; of the lower lever G pivoted to the said support and having its rear end operatively connected with the said core, the upper lever F also pivoted to the said support, and the toothed intergearing segments secured to the respective levers, substantially as and for the purpose set forth.

2. The combination, with the support E, a shunt coil A and a series coil B secured to the said support, a tubular spindle passing through the said coils, and a central core slidable in the said spindle; of the lower lever G pivoted to the said support and having its rear end operatively connected with the said core, the upper lever F also pivoted to the said support, a pawl pivotally connected with the said support and engaging with notches on the lever F, and the toothed intergearing segments secured to the respective levers, substantially as and for the purpose set forth.

3. The combination, with a support E, a shunt coil A and a series coil B secured to the said support, a tubular spindle passing

through the said coils, and a central core slid-
able in the said spindle; of the lower lever G
pivoted to the said support and having its
rear end operatively connected with the said
5 core, the upper lever F also pivoted to the
said support, and the levers X and X' piv-
oted to the ends of the levers F and G and

provided with clamps for the carbons, sub-
stantially as and for the purpose set forth.

F. J. BORLAND.

Witnesses:

HERBERT DUNN,
JABEZ BULLUS.