

No. 672,770.

Patented Apr. 23, 1901.

C. & J. HOLMOK.
ELECTRIC ARC LAMP.

(Application filed Jan. 21, 1901.)

(No Model.)

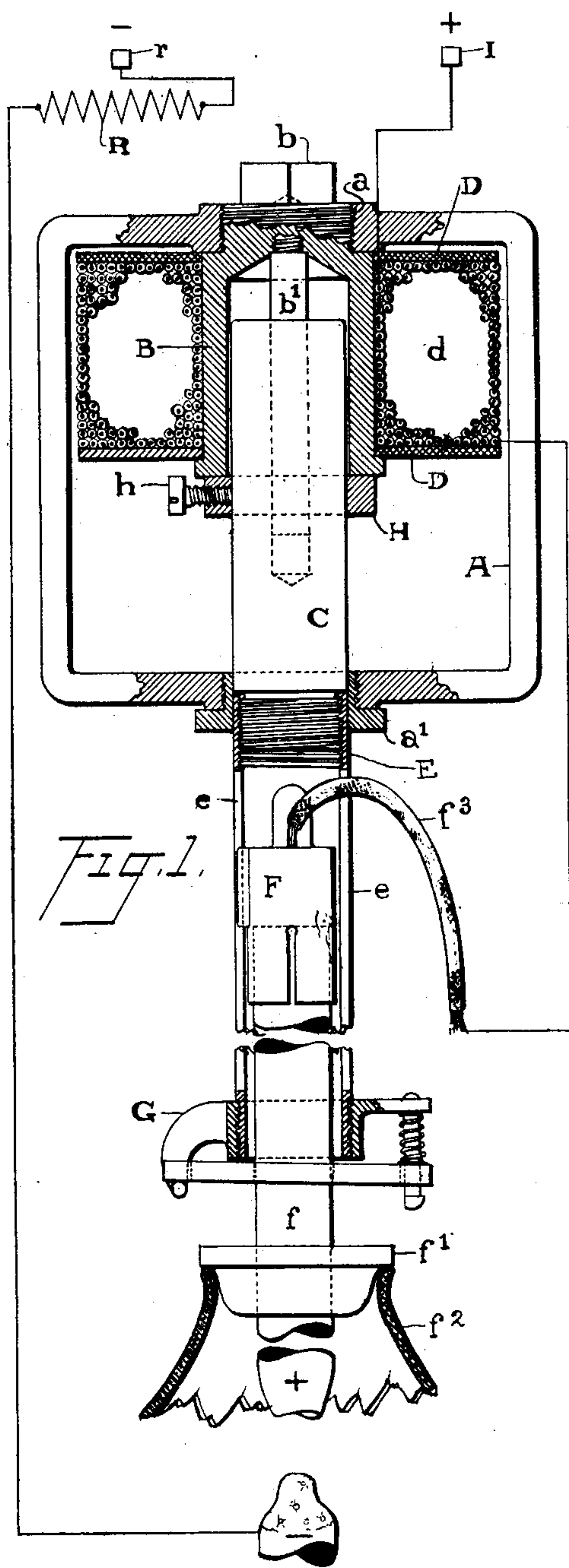


Fig. 1.

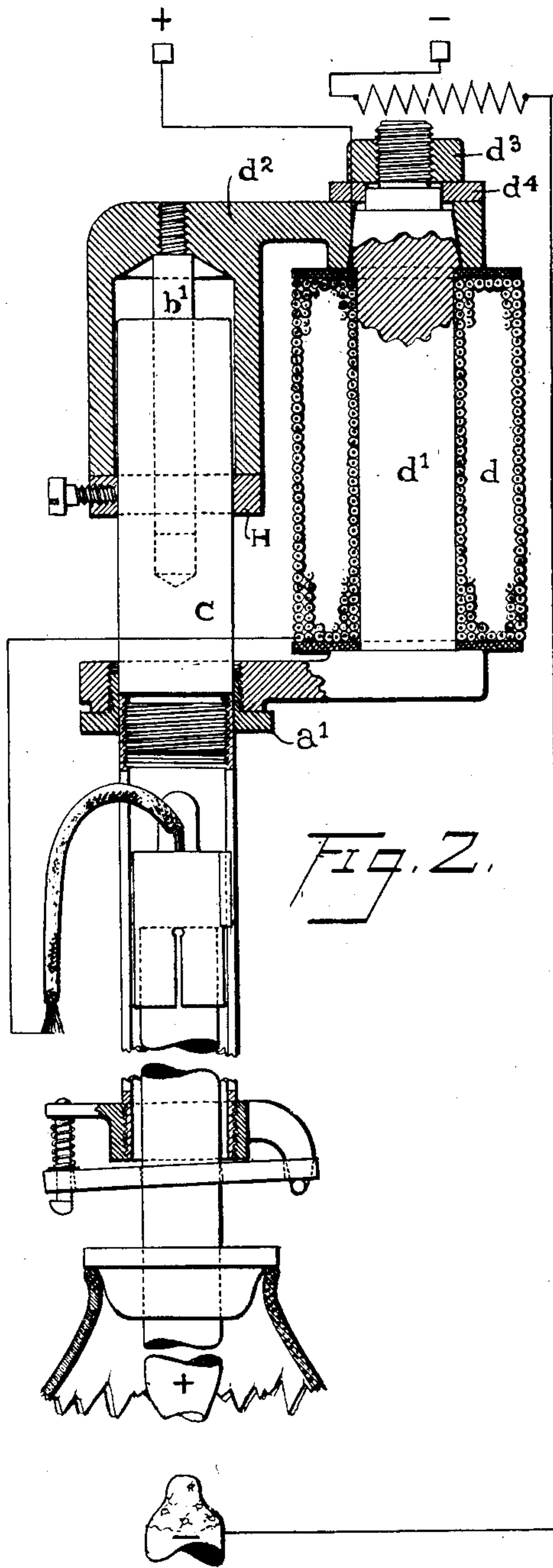


Fig. 2.

WITNESSES:
E. A. Nelson.
E. W. King.

Charles Holmuk INVENTORS.
Julius Holmuk
BY N. S. Swotutz
ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES HOLMOK AND JULIUS HOLMOK, OF CLEVELAND, OHIO.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 672,770, dated April 23, 1901.

Application filed January 21, 1901. Serial No. 44,142. (No model.)

To all whom it may concern:

Be it known that we, CHARLES HOLMOK and JULIUS HOLMOK, citizens of Austria-Hungary, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

Our invention relates to improvements in electric-arc lamps; and it consists more especially of the features pointed out in the annexed claims.

The object of our invention is to provide a magnetic circuit of such a relation as to enable us to use very much less magnet-wire wound upon the lamp-magnet than has heretofore been practical. We accomplish this by reducing the working space between the armature and the iron of the magnet to the smallest possible limits. In other words, the air-space is reduced, so that very few ampere-turns relatively are necessary to force the required density of magnetic lines across the air-gap.

Another new feature of our lamp is that in the solenoid form thereof we make the core of the magnet entirely of a permeable material. In ordinary practice this is not done when solenoid-magnets are used.

With these ends in view we illustrate in the accompanying drawings such instances of adaptation as clearly show the fundamental principles of our invention without in any sense limiting ourselves to the specific constructions shown.

In the accompanying drawings, Figure 1 is an elevation, partially in vertical section, certain portions thereof being also shown diagrammatically. Fig. 2 is a similar view of a modified form of construction.

The constructive features of our lamp are such as to enable us to manufacture the same at a very low cost, and there are no complicated portions of mechanism that require careful alinement in manufacture, &c. In consequence the lamp is cheap to make and very efficient in operation as well as adaptable to widely-varying voltages.

The magnet portion of our lamp is constructed of a rectangular frame A, of material that is highly permeable. In the center of this frame at *a* is formed a threaded hole

into which is placed the hollow core B. This core threads into hole *a* and has formed thereon a squared end *b*, by means of which it is assembled in the most positive and easy manner. Depending from the inside of the core is a brass pin *b'*, which serves as a guide for the armature C. The usual insulated or other magnet-heads D are placed upon the core B with the required wire-space between them, when the core, with the heads in position, is placed in any suitable winding device and the wire-space is filled with the required size of wire, after which the magnet and core are assembled into the magnet-frame by means of threaded hole *a*. The lower portion of the magnet-frame has placed therein a non-permeable bushing *a'*.

The armature C passes through bushing *a'*, and it is itself threaded into the carbon-tube E. This tube is slotted at *e*, so as to form a guideway for the carbon-cap F. The lower end of the tube E carries a ring or other clutch mechanism G, which controls the carbon *f*. The carbon passes through the usual gas-cap *f'*, covering the globe *f*².

An arc-striking stop H, of non-magnetic material, is formed by means of an annular ring, which is adjustably held upon the armature C by a set-screw *h*.

The circuit connections of the lamp are such that the positive terminal is placed at I. From thence it leads to the magnet *d* and then to the flexible cable *f*³, secured to the carbon-cap F. This flexible cable is free to slide in one of the slots *e* of the carbon-tube E. This connection makes the upper carbon positive and the lower carbon negative. From the lower carbon the circuit passes to the steadying resistance R and from thence to the negative terminal *r*. A circuit-controlling switch may be made a part of this circuit, if desired.

It should be understood that we do not limit ourselves to the use of our lamp in its special form of magnetic circuit to a lamp such as shown, adaptable for multiple connection on constant-potential circuits; but the same is equally adaptable to other forms of circuits and lamps, alternating and direct.

The modified construction shown on Fig. 2 also uses a single magnet; but the magnetic relation existing between the core of the mag-

net and its extended pole-piece and the armature C is the same as that shown in Fig. 1.

In Fig. 2 the magnet d is wound upon a core d' . One pole-piece carries the non-permeable bushing a' . The other pole-piece d^2 is removably secured upon the core d' by a nut d^3 and washer d^4 . The projection of the pole-piece d^2 is practically the same in construction as the core B. An arc-striking limit-stop H is also shown, and it will be observed that this stop and the guide-rod b' are the same as shown in Fig. 1, and the circuit connections are also similar.

It should be understood that we do not limit ourselves to the use of an arc-striking limit-stop H, as when the working position of the armature is such as shown in Fig. 1, the arc being fully drawn, the stop H is hardly necessary, because the armature would move but a very little distance farther, when it would come to a state of rest of its own accord.

The space between the guide-pin b' and the bottom of the hole within the armature C may serve as a dash-pot, or the dash-pot may be formed above the armature C in case the guide-pin b' is displaced by a non-magnetic bushing that may be secured in the lower end of the magnet-core B or the pole projection d^2 . Such a bushing would serve as a guide for the armature C the same as pin b' .

What we claim is—

1. In electric-arc lamps, a solenoid-magnet, a hollow permeable core therefor, a permeable frame for supporting said core, one side of said frame being so disposed as to place a large air-gap between this portion of said frame and the core of the magnet in combination with an armature of highly-permeable material adapted to move within said core and means for guiding the same concentric therewith, such means presenting very great magnetic reluctance, substantially as set forth.

2. In electric-arc lamps, a magnet-frame and a removable hollow magnet-core secured thereon, the said frame and core being formed of highly-permeable material in combination

with a permeable armature adapted to move within the core and span the air-gap between the core and one side of said frame, substantially as set forth.

3. In electric-arc lamps, a magnet-frame of highly-permeable material comprising a magnet-space, a hollow pole-piece and a large air-gap in combination with a permeable armature adapted to bridge the air-gap, substantially as set forth.

4. In electric-arc lamps, a magnetic circuit comprising a magnet-space, pole-endings thereto, one of said endings being formed hollow and a movable armature adapted to operate therein, the said armature extending through the other pole-piece in combination with a carbon-tube and clutch secured thereon, substantially as set forth.

5. In electric-arc lamps, a solenoid-magnet, a hollow permeable core therefor, said core extending throughout the length of the magnet, a magnet-frame supporting said core, a permeable armature adapted to move within the core and also through the frame in combination with a carbon-tube and suitable clutch secured to the armature and an arc-striking limit-stop adjustably secured to said armature, substantially as set forth.

6. In electric-arc lamps, a magnetic circuit comprising a magnet-space, pole-endings therefor, said magnetic circuit being magnetically discontinuous between the magnet-core and one of the pole-endings and an armature adapted to span such discontinuous portion of the magnetic circuit in combination with a non-permeable arc-striking limit-stop adjustably secured upon the said armature, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES HOLMOK.
JULIUS HOLMOK.

Witnesses:

N. S. AMSTUTZ,
H. C. OSBORN.