(No Model.)

F. S. GIEL.

ELECTRIC ARC LAMP.

No. 279,934. Patented June 26, 1883.

fig. 5.

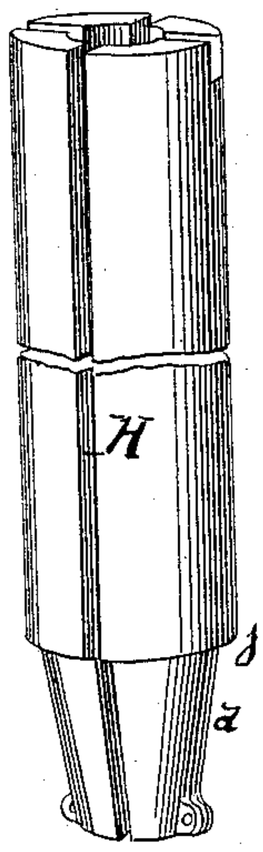


fig. 1.

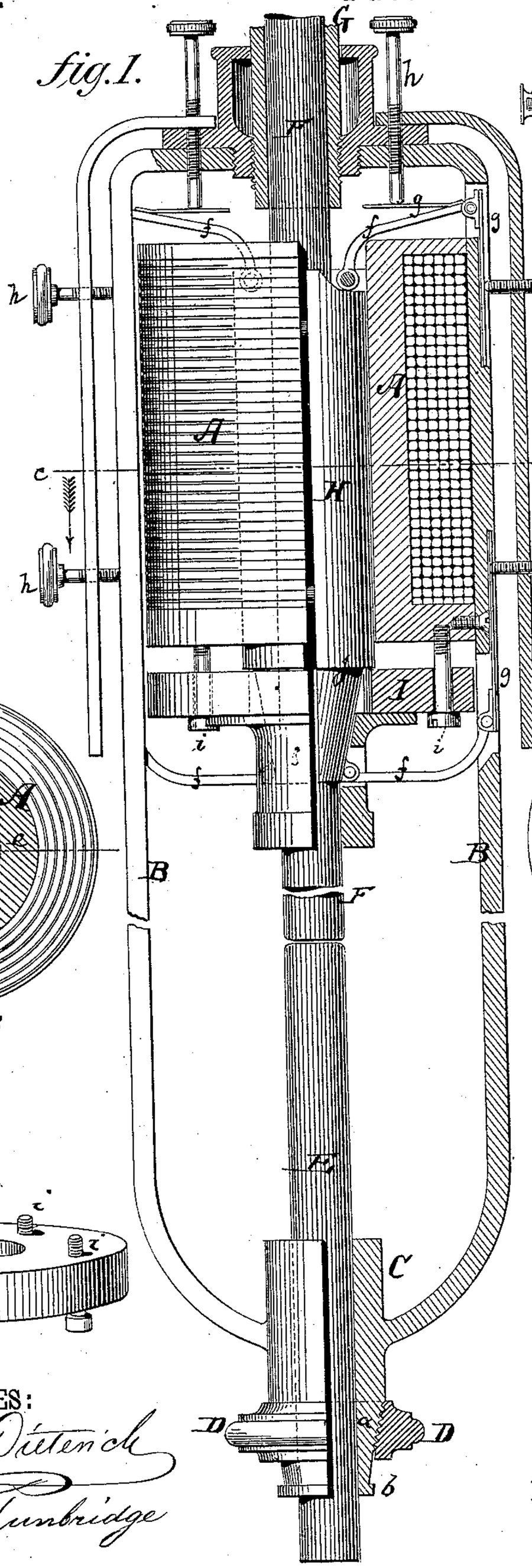


fig. 4.

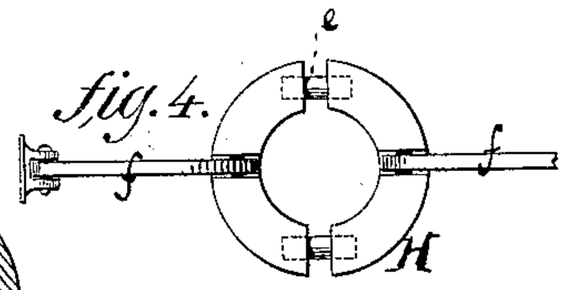


fig. 6.

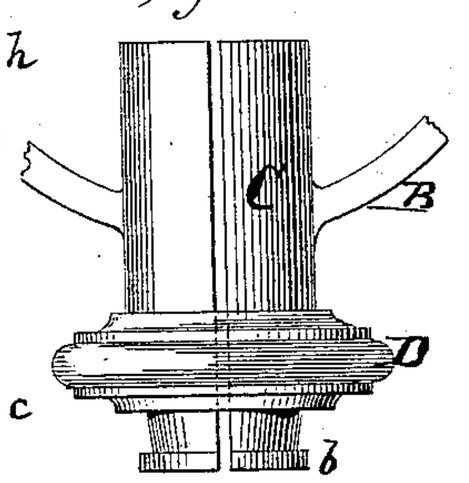


fig. 2.

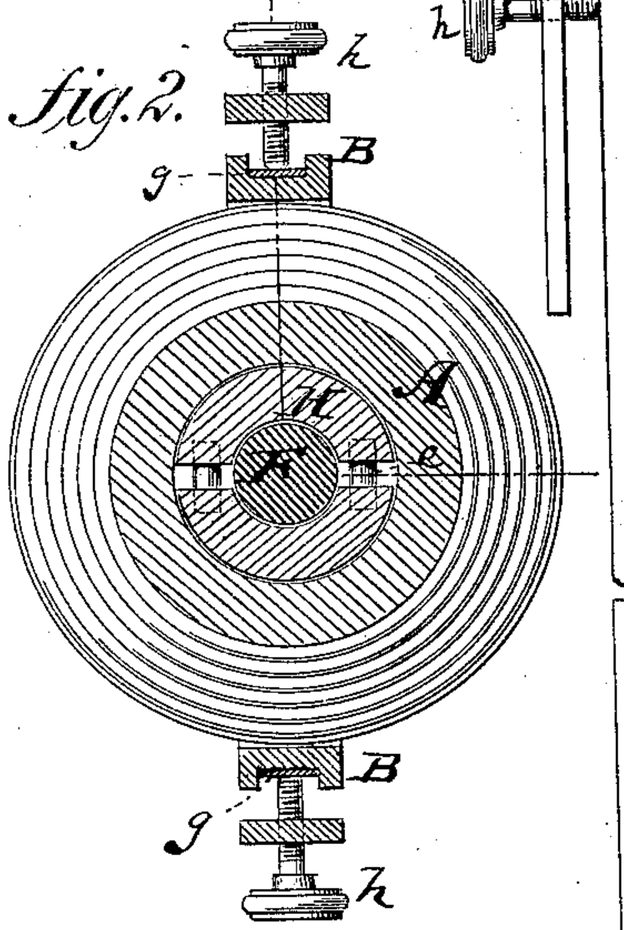


fig. 3.

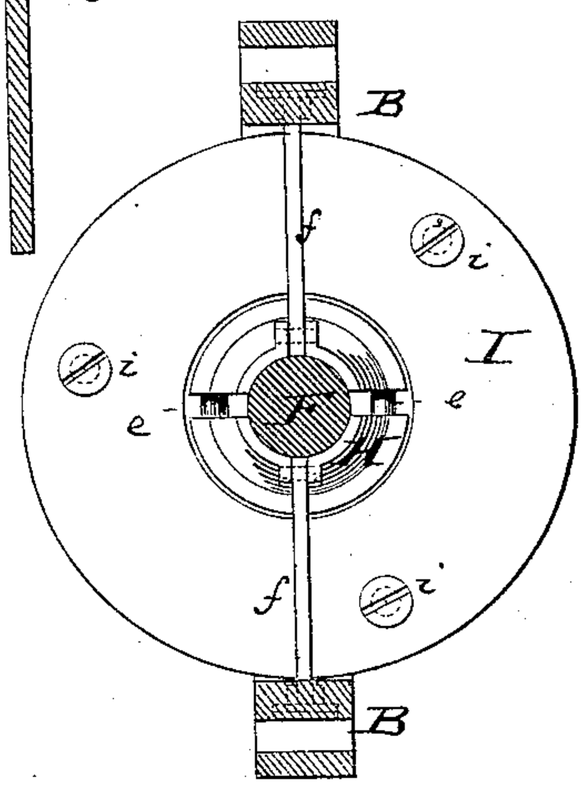


fig. 7.

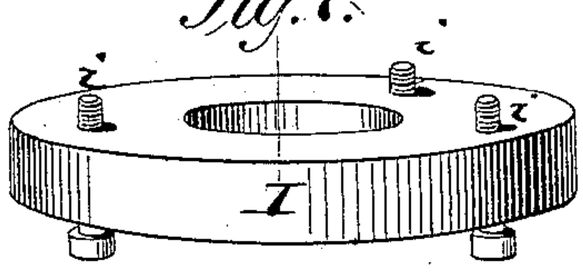
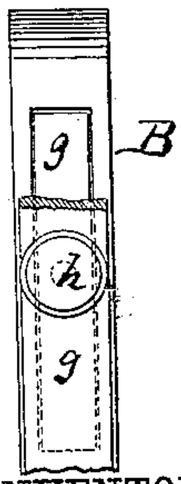


fig. 8.



WITNESSES:

Gustave Dittenich

John C. Tunbridge

INVENTOR

Franz S. Giel

BY Briesen & Betts

his ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANZ S. GIEL, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO JOSEPH LEDERLE, OF TOMPKINSVILLE, NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 279,934, dated June 26, 1883.

Application filed October 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANZ S. GIEL, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Electric Lamp, of which the following is a specification.

Figure 1 represents a side view, partly in section, of my improved electric lamp. Fig. 2 is a horizontal section on the line *c c*, Fig. 1. Fig. 3 is a bottom view, partly in section, of the upper portion of the lamp. Figs. 4, 5, 6, 7, and 8 are detail views of the parts of the lamp, hereinafter more fully referred to.

The object of this invention is to produce an electric lamp in which the movable carbon rests on a fixed carbon before the power of the electric current is brought into play, and in which, when the current exceeds its proper strength, the upper carbon will be raised farther away from the lower, so as to prevent the sudden enlargement of the flame and other irregularities in the appearance of the flame which would result if the carbons should maintain their relative positions during all the variations of the current. This adjustment of the upper carbon is necessarily automatic, and is in the example which has been illustrated in the drawings produced by interposing between the carbon and a surrounding electro-magnet an iron core-clamp, which, when raised by the action of the electro-magnet, will clamp the carbon and lift it away from the lower carbon. The further elevation of the iron clamping core is produced whenever the current which travels through the electro-magnet exceeds its normal limit.

The invention consists of the devices hereinafter described for obtaining the automatic adjustment referred to, either in the form particularly shown or in analogous forms.

In the drawings, the letter A represents an annular electro-magnet, having its body entirely made of iron and placed in circuit, and secured in a framing, B, which is supported or suspended in suitable manner. The lower part of the framing B has a ferrule, C, which is split, being made in two parts, each part being affixed to the framing B, as shown more clearly in Fig. 6, and which has a threaded conical portion, *a*, around which is fitted a nut, D, matching its thread. Whenever this nut D is screwed up over the larger part of the cone *a*, the split ferrule C is clamped to firmly grasp and hold the lower carbon, E. For moving the lower carbon, E, upwardly or removing it for replacement, the split ferrule is partly opened by lowering the nut D until it rests on a shoulder, *b*, at the lower part of the ferrule, and thus allows the free adjustment of the lower carbon, E, in the ferrule or the putting in of a new carbon. The upper carbon, F, stands vertically on the lower carbon, E, and passes through the electro-magnet A axially, its upper portion being guided in a sleeve, G, which is supported on the frame B, as shown. Within the electro-magnet is interposed, between the same and the carbon F, the iron carbon-clamp H, which is more clearly illustrated in Fig. 5, and which consists of two semi-cylindrical shells that are adapted to fit the inner bore of the electro-magnet, and to receive the carbon F, and that are tapered beneath a shoulder, *j*, at their lower parts, as shown at *d*. It is essential that the two parts of the clamp H, although they are laterally adjustable with reference to one another, should, when moved vertically, move simultaneously, and to this end dowels or pins *e* project from one of these halves into sockets or mortises in the other half, as indicated in Fig. 4, which is a top view of the clamp H. The clamp H is of iron, and so magnetized by the inductive action of the electro-magnet A that its poles should be the reverse of those in the electro-magnet—that is to say, in the iron body of the electro-magnet A the positive pole shall be at the upper end and the negative pole at the lower end, whereas in the core-clamp H the positive pole shall be at the lower end and the negative pole at the upper end. The ends of the clamp H are united by links *f* with springs *g*, that are secured in the frame B, and when the clamp H is lifted these links and springs act to push the two parts of the clamp toward one another, and thus to cause the clamp to grasp the carbon F and lift it too. The power of the springs *g* can be regulated by suitable screws, *h*. Below the electro-magnet, and around the conical portion *d* of the carbon-clamp H, is placed an iron ring, I, which is suspended by the heads of three (more or less) guide-screws, *i*, that are secured in the electro-magnet. This ring fits under the

shoulder *j*, which separates the conical from the cylindrical portion of the clamp H.

The operation of the lamp is as follows: During the normal power of the current for producing a certain light the upper carbon will be held slightly above the lower carbon, and the carbon-clamp H will be nearly dropped upon the ring I; but when the power of the current is unduly increased the ring I will be attracted by the lower part of the electro-magnet, so as to lift the carbon-clamp H, and the latter will also be lifted by the action of the powerful current in the electro-magnet, and the links *f* will then be caused to push the two halves of the carbon-clamp H tightly against the carbon F, so that the latter will be lifted with the clamp H, and the points of the carbons E F thus be further separated while the too powerful current lasts. When the power of the current becomes normal again, the attraction which lifted the clamp H ceases, and the same drops by its own weight into the normal position, thereby carrying the carbon F back to its normal position.

I deem it an important feature of my invention to automatically move one of the carbons away from the other under the influence of a too powerful current, and in this connection I deem it proper also to state that the invention is applicable to the adjustment of either the upper or the lower carbon, the modifications necessary for moving the lower carbon away from the upper, instead of the upper away from the lower, requiring no other specifications to one who is skilled in the art of making electric lamps.

I claim—

1. In an electric lamp having two carbons, E F, the combination of the electro-magnet A, having iron body, with an interposed magnetized annular carbon-clamp, H, made of two separated halves, both contained within the electro-magnet, and with the movable carbon F, all arranged so that when the current passing through the electro-magnet becomes too powerful the clamp H will thereby be moved vertically, and all its parts also horizontally, substantially as specified.

2. The combination of the electro-magnet A with the magnetized annular carbon-clamp H, made of separated halves, links *f f*, springs *g g*, and frame B, the clamp being the core of the electro-magnet, substantially as specified.

3. The combination of the electro-magnet A with the carbon-clamp H, ring I, and links *f*, substantially as and for the purpose specified.

4. In an electric lamp, the combination of the split ferrule C, each part whereof is fixed to the frame B, and having conical threaded portion *a* and shoulder *b*, with the movable embracing-nut D, threaded conically, and with the carbon E, substantially as described.

5. The combination of an electro-magnet with the inner core, which is split throughout its length, and with an outer stationary frame, to which the two parts of the split core are connected, for the purpose of producing vertical motion of the core, and also horizontal motion of its two equal parts by the current that traverses the electro-magnet, substantially as described.

FRANZ S. GIEL.

Witnesses:
WILLIAM H. C. SMITH,
WILLY G. E. SCHULTZ.