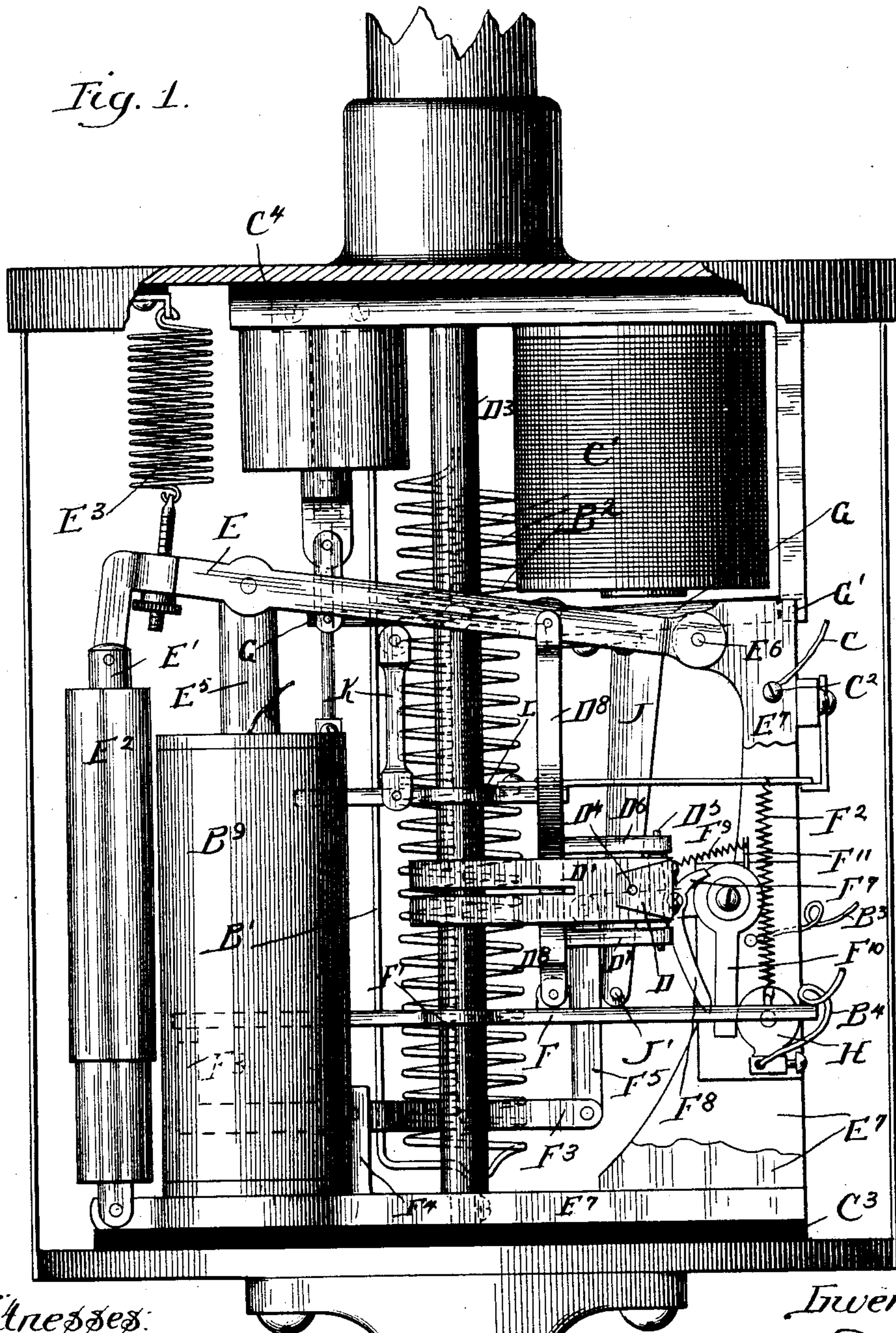


3 Sheets—Sheet 1.

No. 473,956.

Patented May 3, 1892.

Fig. 1.



Witnesses:

Celeste P. Chapman
Harriet M. May.

Inventor:

Charles A. Pfleger.

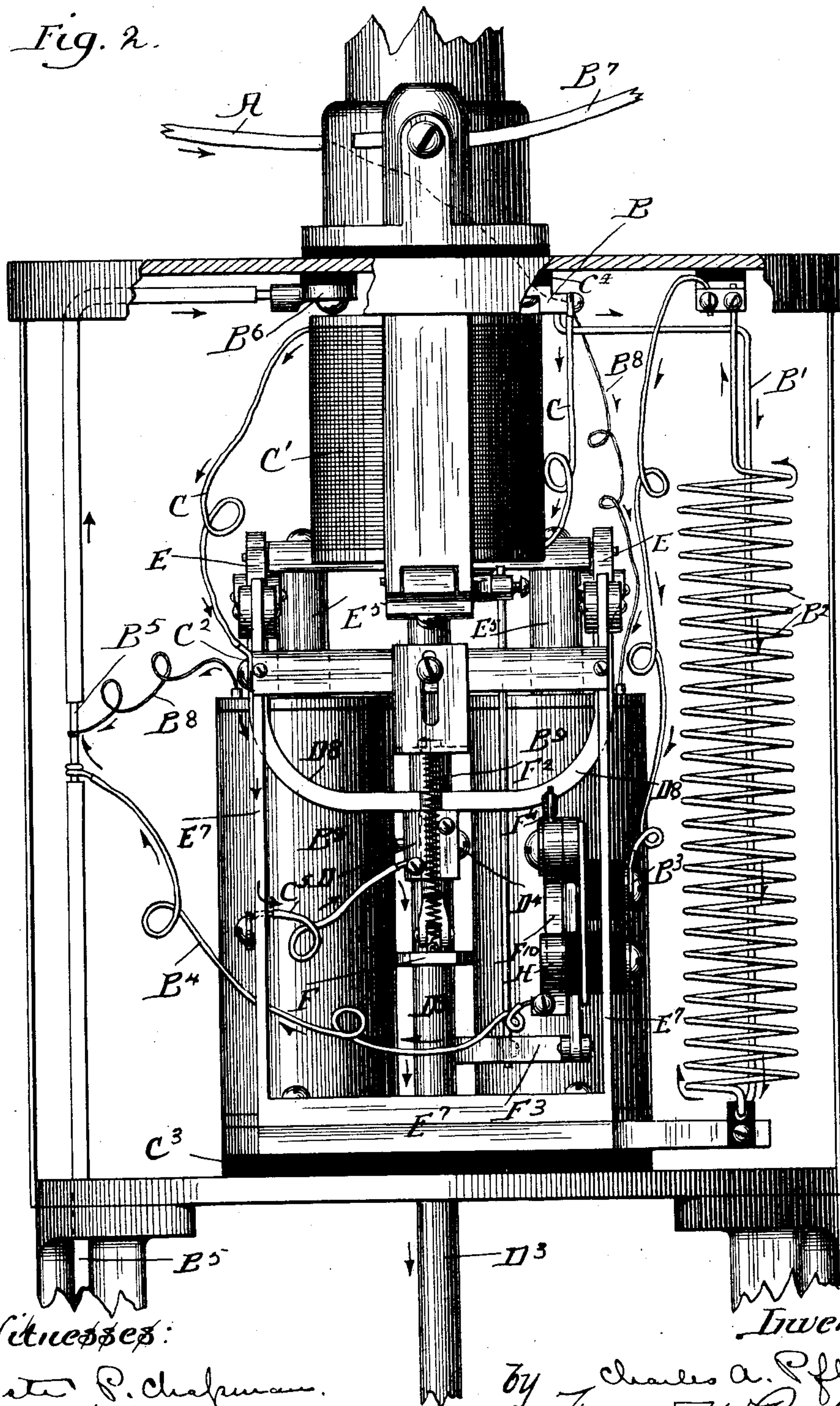
by
James W. Parker,
Attorney.

C. A. PFLUGER.
ELECTRIC ARC LAMP.

No. 473,956.

Patented May 3, 1892.

Fig. 2.



Witnesses:

Celeste P. Chapman.
Harriet M. May.

Inventor:

by Charles A. Pfluger
Francis W. Parker,
Attorney.

C. A. PFLUGER.
ELECTRIC ARC LAMP.

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Patented May 3, 1892.

Fig. 3.

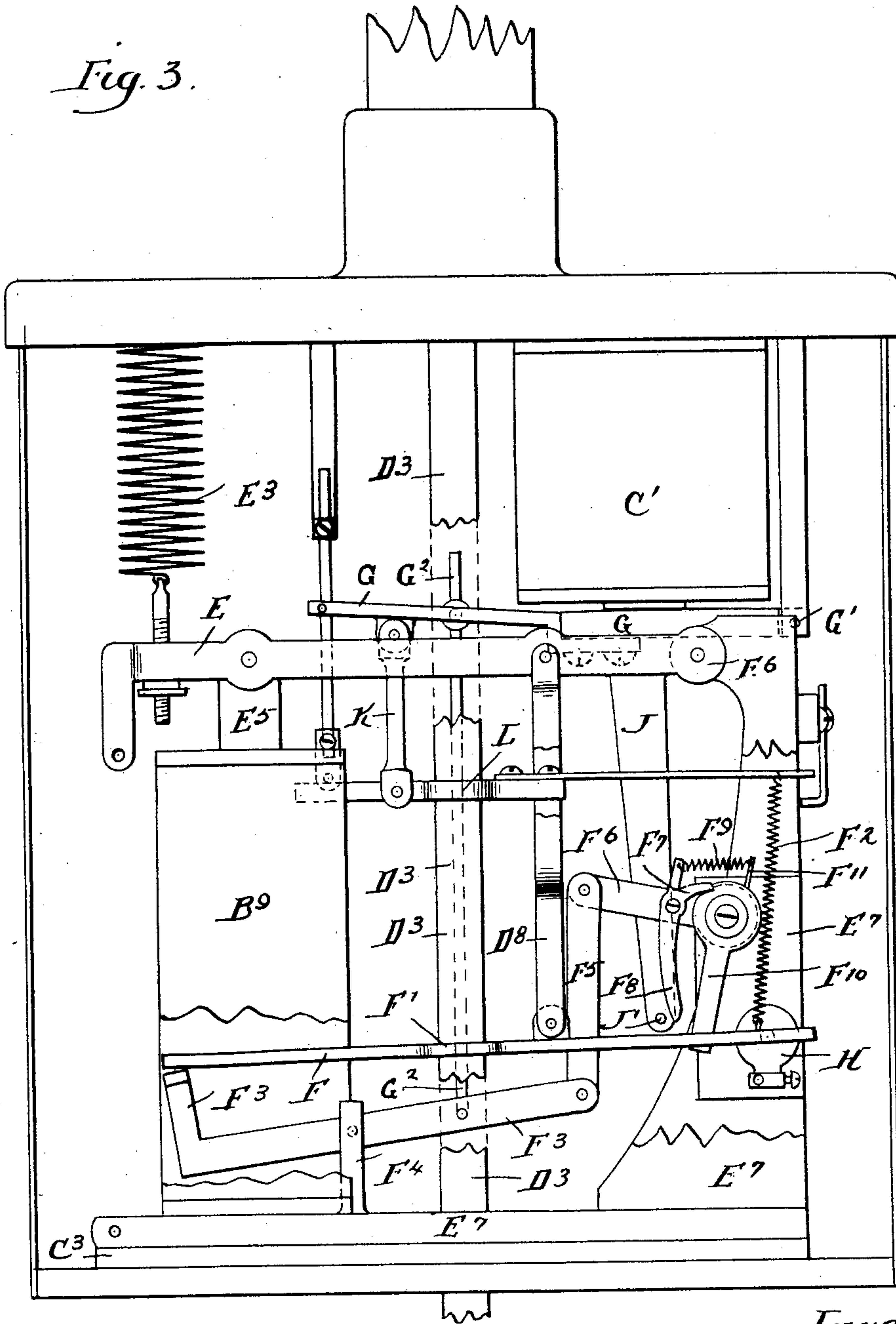
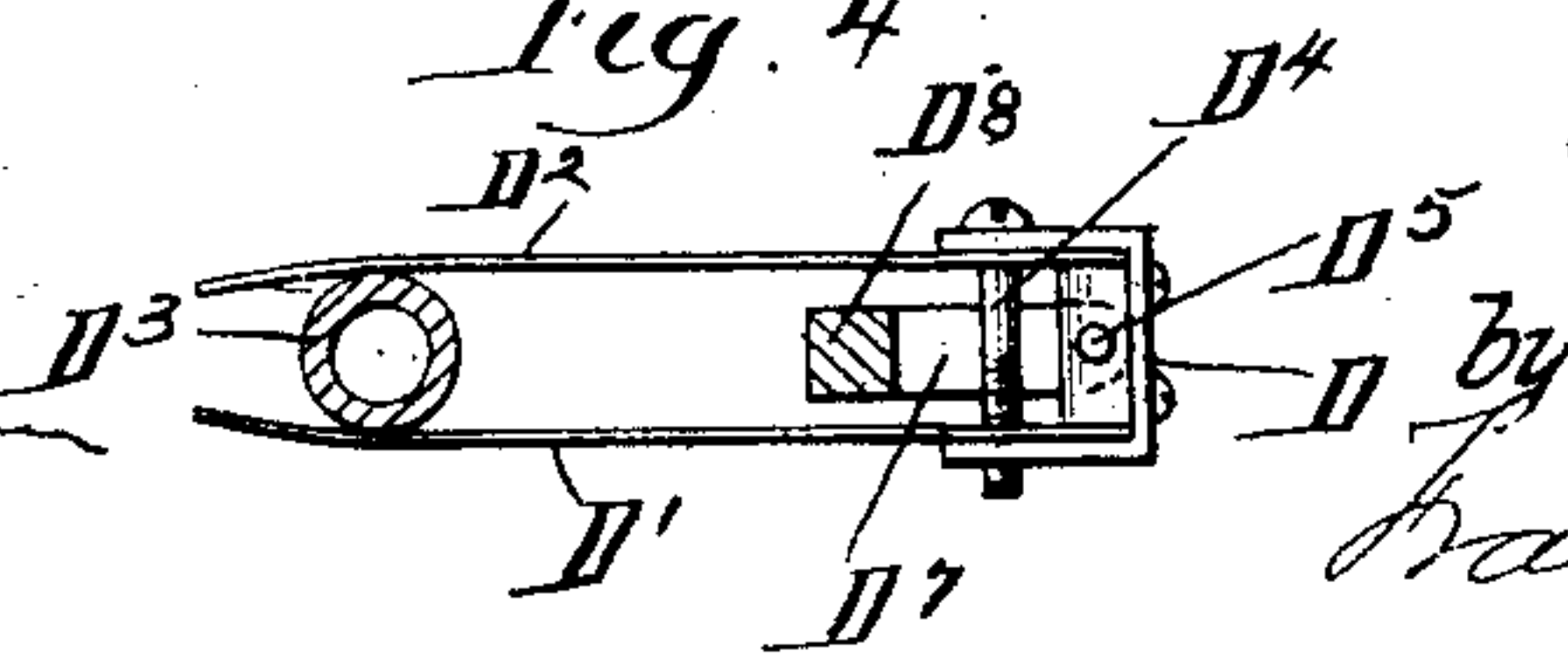


Fig. 4.



Inventor:

Charles A. Pfleger

by
James W. Parker
Attorney.

Witnesses:

Charles P. Chapin
Haniet M. May.

UNITED STATES PATENT OFFICE.

CHARLES A. PFLUGER, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE STANDARD ELECTRIC COMPANY, OF ILLINOIS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 473,956, dated May 3, 1892.

Application filed November 13, 1890. Serial No. 371,294. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. PFLUGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Arc Lamps, of which the following is a full, clear, and exact specification.

My invention relates to arc lamps, and has for its object to provide a cheap and simple lamp, and particularly to provide convenient means for conducting the current to the upper carbon and for cutting out the lamp.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the lamp, the same being momentarily cut out. Fig. 2 is a rear view of the lamp, showing more fully the circuits. Fig. 3 is a detail view of the mechanism of the lamp, the same being in operation. Fig. 4 is a detail of the device for conveying the current to the upper-carbon rod.

Like parts are indicated by the same letters in all the figures.

I have illustrated only the regulating mechanism of the lamp, as the remaining portions are so well known as not to require full illustrations.

A is a main conductor, leading to the contact B, and thence by the conductor B' through the resistance B² to the screw B³. When the circuit is closed by the operation of the cut-out, the current passes through such cut-out mechanism and by the conductor B⁴ to the conductor B⁵, thence to the binding-post B⁶, thence to the wire B⁷. From the contact or binding post B a shunt-conductor B⁸ leads to the coils B⁹ B⁹ of the shunt-magnet and thence to the conductor B⁵. From the same binding-post B leads the conductor C to the main-circuit magnet C' and thence to the frame at C². This frame is insulated above and below at C³ and C⁴, but from one part of it leads the conductor C⁵ to the support D, which is U-shaped in cross-section, as shown in Fig. 4, and has the operating spring-arms D' D² to bear on the upper-carbon rod D³, and has the transverse screw-bolt D⁴, by means of which its sides may be brought together to bring the spring-arms D' D² nearer together. The whole of this device shown in Fig. 4 is pivoted to a

vertical pivot D⁵, which is journaled in the arms D⁶ D⁷, which are secured to the link or hanger D⁸. The hanger D⁸ is pivoted to the lever E, at the outer end of which is secured the plunger E' and the dash-pot E² and the counteracting spring E³ and the cores E⁵ E⁵ and the shunt-magnets B⁹ B⁹. It is understood of course that the lever E is bifurcated so as to carry both of the cores E⁵ E⁵. This lever E, or the ends thereof, are pivoted at the rear of the lamp at E⁶ E⁶ to the fixed frame E⁷. With the shunt-magnets operating it is evident that the lever E is raised and lowered, and with it the link D⁸; but since the device shown in Fig. 4 for the purpose of conveying the current from the frame, and hence from conductor C to the carbon-rod, is supported upon the link D⁸, it will rise and fall with such lever E, and hence responsive to the changes in the strength of the shunt-magnets. This link or hanger D⁸ carries at its lower end the clutch-rod F, which is enlarged at F' to encircle the carbon-rod, and is upwardly held at one end by the spring F², and adjustably supported at the other by the stop F³.

G is the armature of the main-circuit magnet C', pivoted at G' and connected by the rod G² with the stop F³. This latter is pivoted on the standard F⁴ and has the link F⁵, pivoted to the link F⁶, which carries the dog F⁷, provided with the tail F⁸ and the spring F⁹. The link F⁶ is pivoted concentric with the circuit-closing piece F¹⁰, adapted to engage the contact H, from which leads the conductor B⁴ and which is insulated from the binding-post B³, except when such contact is made.

J is the arm from the lever E, having the pin J' adapted to engage the tail F⁸ on dog F⁷.

If the parts are in the position shown in Fig. 3, the arc will be in process of burning, and if it have such a resistance or an impediment in the feed as to shunt an abnormally-large current into the shunt-magnet they will become abnormally strong and will so far overcome the spring E³ as to bear down the lever E and force down the arm J until its pin will sufficiently engage the tail F⁸ to trip the dog F⁷ from its engagement with the enlarged upper end of the pivoted circuit-clos-

ing piece F^{10} . The spring F^9 now pulls down the pin F^{11} , and thus the lower end of the circuit-closer comes against the contact-plate H and short-circuits the lamp or cuts out the shunt mechanism. If the parts are now in such condition that they cannot work, the current will continue to flow through such short circuit, including the resistance B^2 , and the parts will remain substantially in the position indicated in Fig. 1. If, as is usually the case upon such short circuit being made, the parts resume their normal position, the carbons falling into contact, the stop F^3 will move on its pivot from the position shown in Fig. 3 to that shown in Fig. 1 and the dog will re-engage its notch. A certain portion of the current will be shunted through the main-circuit magnet C' and immediately it will lift its armature G, and thus lift the stop F^3 into the position shown in Fig. 3, and thus raise such dog and move the circuit-making piece F^{10} away from the contact-plate H, and the lamp will resume its operation. As the main-circuit magnet thus lifts its armature, it lifts with it the link K, carrying the clutch I, whereby the upper-carbon rod D^3 is lifted to establish the arc.

I do not herein desire to dwell upon the operation of the main-circuit magnet and shunt-magnets, except so far as may be necessary to an understanding of the operation of the device shown in Fig. 4, and the cut-out, as I have sufficiently shown and described these portions in my patent application, Serial No. 358,983.

The use and operation of my invention, so far as the same relates to the cut-out and the conveyance of the current to the upper carbon, is as follows: The main-circuit magnet being energized by an introduction of the current into the lamp, bears up its armature and at the same time tilts the stop F^3 into the position shown in Fig. 3. The clutch L simultaneously engages the upper-carbon rod, lifts the same, and establishes the arc. By so doing it comes into a horizontal position, where it loses its grip on the carbon-rod and hence its control upon the same. Simultaneously with this action, however, occurs the operation of the shunt-magnet, which controls its clutch, to feed the carbon in the usual manner. As before described, if the current becomes abnormally strong in the shunt-magnet the dog F^7 is tripped from its engagement with the enlarged upper portion of the circuit-making piece F^{10} , and the latter is thrown in contact with the plate H. Thereupon the current passes from the conductor A through the resistance-coil, thence through the plate H to the conductor B^5 , and thence to the line-con-

ductor B^7 , and the carbons of the lamp will come together and the parts will assume the position indicated in Fig. 1. Immediately the current will pass through the main-circuit magnet again, and it will lift its armature and bring the parts into the position shown in Fig. 3, thus breaking the cut-out, and the lamp will resume its operation. In the process of feeding the device for conducting the current from the fixed frame to the upper-carbon rod will move with the feed-clutch, as it is connected directly thereto, both being swung upon the same link or hanger, from the lever which is controlled by the shunt-magnets. Thus a sliding contact with such carbon-rod is made, and since the contacting-arms D' and D^2 move up and down with the rod an exceedingly-delicate feed is possible. Moreover, by pivoting these arms to the same vertical pivot they will always bear with equal force upon the opposite sides of the carbon-rod, and the same tension may be given by turning the transverse screw D^4 .

It is quite evident that great changes could be made in the construction and arrangement of this device without materially departing from the spirit of my invention, and I do not wish to be limited in the application of such cut-out and current-carrying devices, as I expect to apply both in lamps of greatly-different form from that herein shown.

I claim—

1. In an arc lamp, a current-carrying device consisting of fingers to engage the carbon-rod on opposite sides and means whereby they may be adjustably brought together, and a vertical pivot on which such device is supported, so that the fingers bear with equal pressure on opposite sides of the carbon-rod.

2. In an arc lamp, the combination of the feeding magnet or solenoid with a current-carrying device independent of such feeding magnet or solenoid and adapted to lead the current from a fixed portion to the upper-carbon rod, said device consisting of arms clasp- ing the rod on both sides, movably responsive to variations in the strength of the feeding magnet or solenoid.

3. In an arc lamp, the combination of the feeding magnet or solenoid with a feeding-clutch operated thereby and a separate current-carrying device distinct from such clutch and adapted to lead the current to the upper-carbon rod, said device supported so as to be always equidistant from and to travel with the feeding-clutch.

CHARLES A. PFLUGER.

Witnesses:

CELESTE P. CHAPMAN,
HARRIET M. DAY.