

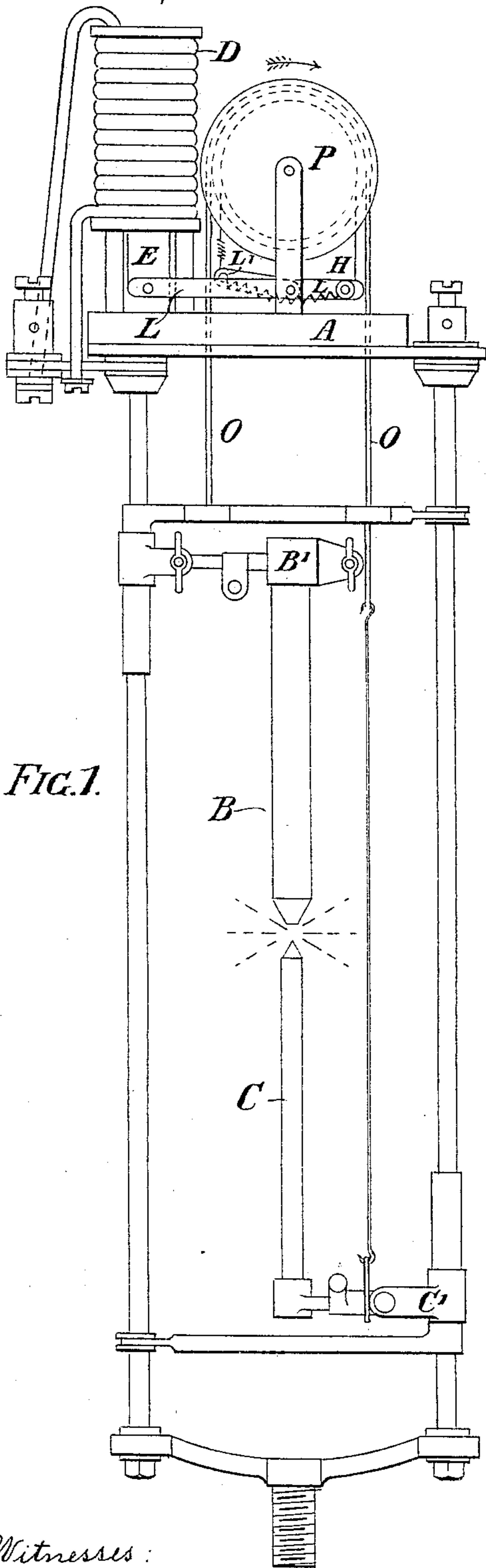
(No Model.)

2 Sheets—Sheet 1.

F. T. SCHMIDT.  
ELECTRIC ARC LAMP.

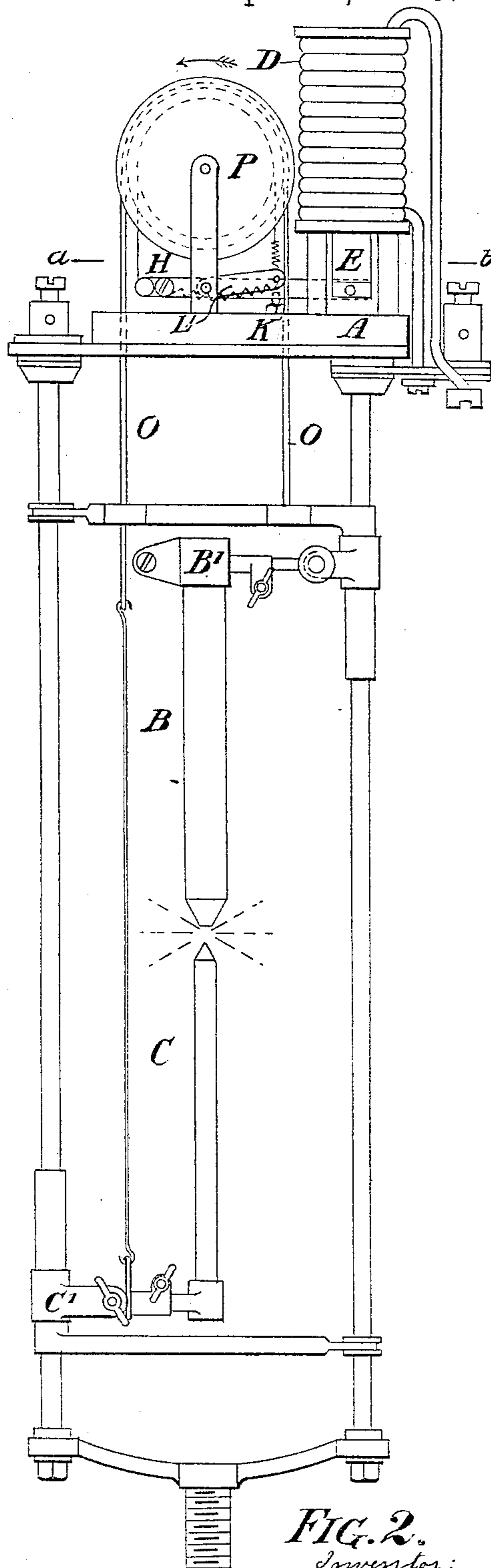
No. 495,601.

Patented Apr. 18, 1893.



*FIG. 1.*

Witnesses:  
E. H. Sturtevant.  
O. A. Kibler.



*FIG. 2.*

Inventor:  
Frederick Thomas Schmidt  
By *Richard A. [Signature]*  
attys.

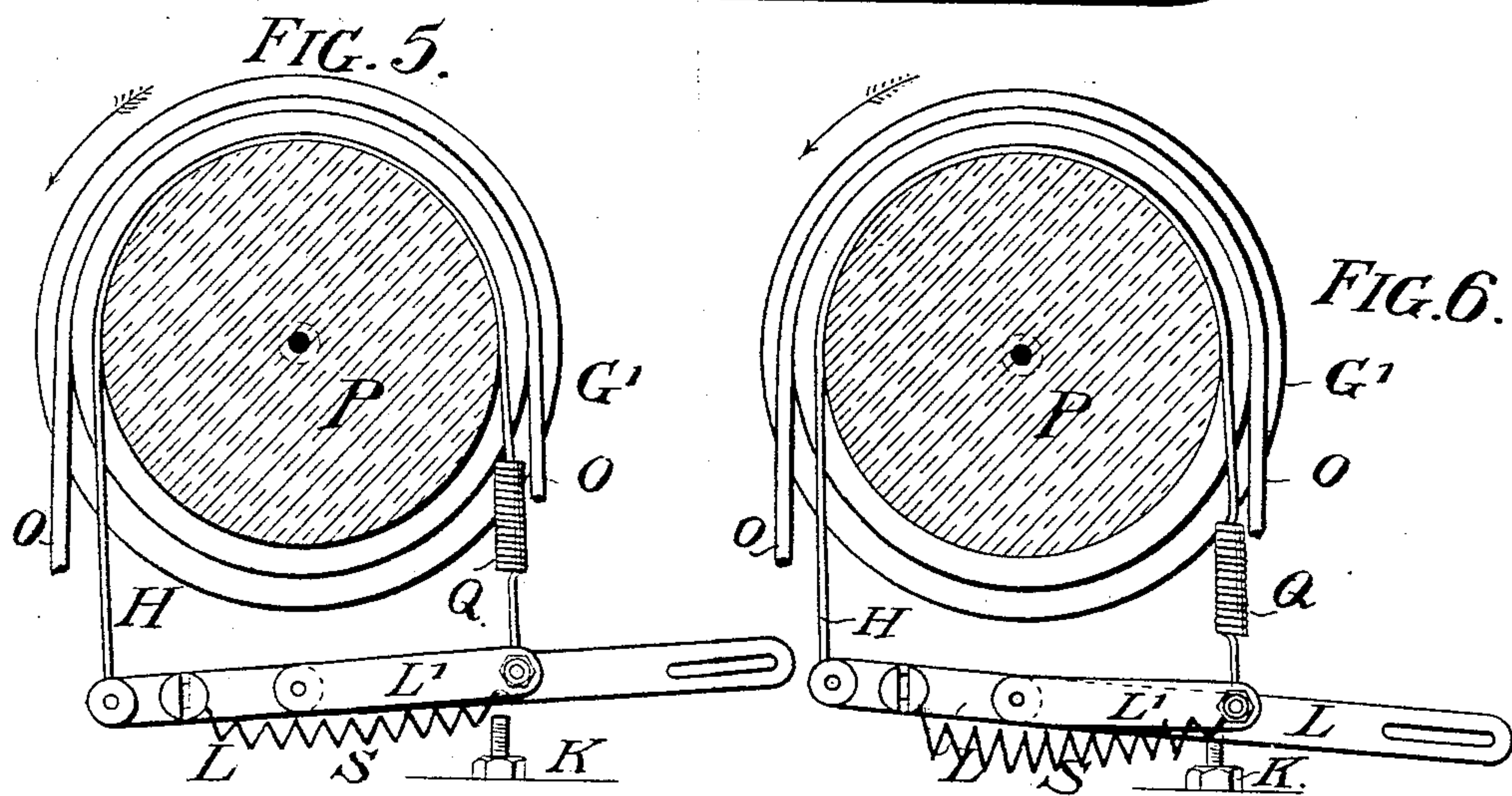
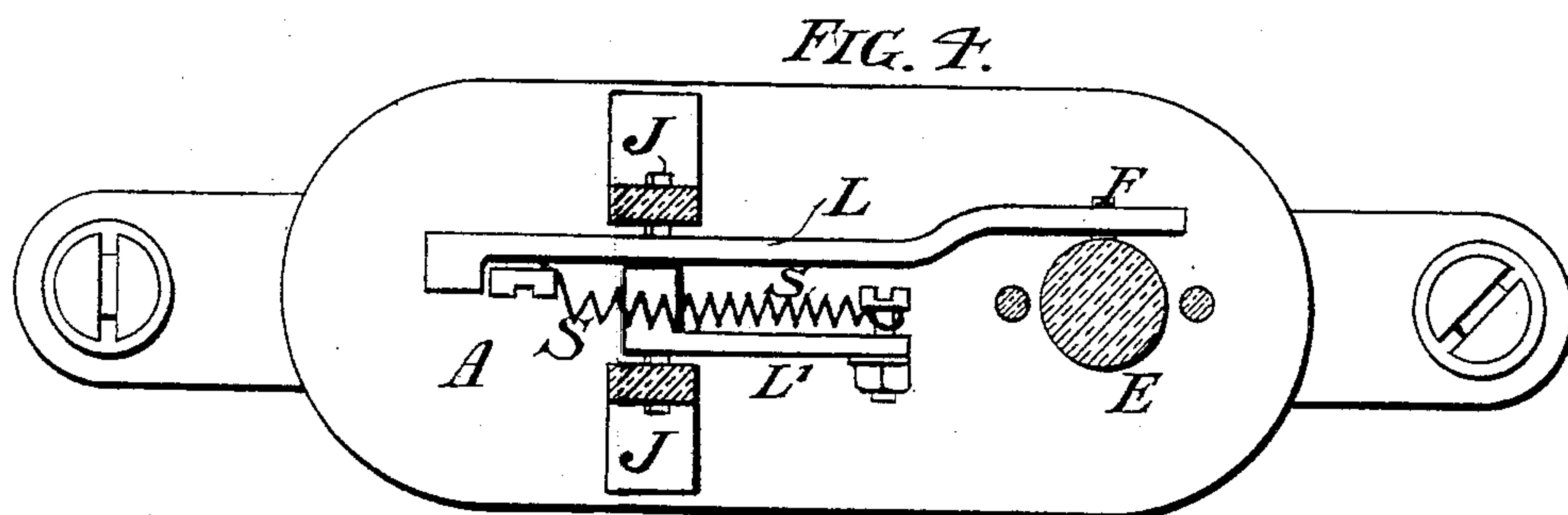
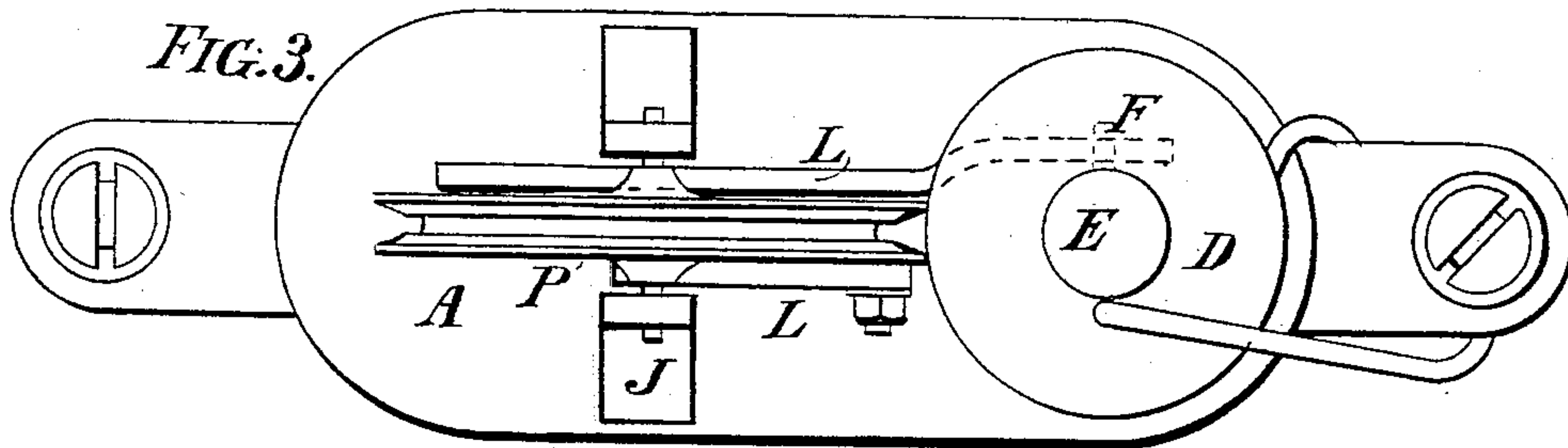
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2 Sheets—Sheet 2.

F. T. SCHMIDT.  
ELECTRIC ARC LAMP.

No. 495,601.

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Witnesses:  
E. H. Sturtevant  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

FREDERICK T. SCHMIDT, OF BRADFORD, ENGLAND.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 495,601, dated April 18, 1893.

Application filed August 24, 1892. Serial No. 443,949. (No model.) Patented in England December 2, 1891, No. 21,018.

*To all whom it may concern:*

Be it known that I, FREDERICK THOMAS SCHMIDT, a subject of the Queen of Great Britain and Ireland, residing at Bradford, in the county of York, England, have invented certain Improvements in the Construction of Electrically-Controlled Arc Lamps, (for which I have obtained Letters Patent in England, No. 21,018, dated December 2, 1891,) of which the following is a specification.

The object of this invention is to construct the operating portions of arc lamps by a novel combination of parts arranged in such a manner that the arc or distance between the carbons is positively formed, and the carbons electrically controlled and adjusted according to the consumption of the said carbons and thereby to produce a steady regular and uniform light, with less electrical energy by being enabled to dispense with the aid of an electrical shunt or by pass.

In describing my invention in detail reference is made to the accompanying sheet of drawings, representing so much of an arc lamp as is necessary to make clear my invention which is added thereto.

Figure 1. is an elevation of an arc lamp frame fitted with my improvement; Fig. 2. a view illustrating the opposite side of the same; Fig. 3. a plan drawn to a larger scale; Fig. 4. a sectional plan through line *a. b.*; Fig. 5. a sectional detail of the grooved pulley and the position of the lever when under electrical control; Fig. 6. a similar section showing the position of the lever when at rest, and Fig. 7. a plan of the grooved pulley showing the section of the compound groove in the same.

Upon a suitable table A. above the carbons B and C. is mounted a solenoid D. the plunger or core E of which is prepared with an arm F. engaging with the slot hole cut in lever L. This lever is mounted near its center on a fulcrum pin J. and upon the said fulcrum pin is mounted a second lever L'. the opposite end of which, when the electric current is not passing through the lamp, is supported by an adjustable stop at K. The last named lever may be made to rest on the stop K. by means of a weight attached to or forming part of the said lever or by its equivalent, a spring S. applied in the manner shown. A cord H. is attached to the lever L. and

passes over the pulley P. in the narrow portion G. of the compound groove, the other end of the cord H. being attached to the second lever L'. so that, when the arc is formed, the cord H. is kept tight in contact with and grips the pulley P. to such an extent by means of the weighted lever L'. or by its equivalent spring S. that the pulley P. is prevented from moving on its axis so long as the carbons remain at the requisite distance apart.

The compound groove in the pulley P. is constructed for the reception of two cords, the one above the other, the narrow groove G. for the cord H. while the enlarged portion of the groove nearer the periphery of the pulley is fluted or milled at G'. in the direction of the axis of the pulley for the two fold purpose, first for receiving the cord O. supporting the upper and lower carbon holders B' and C'. and secondly, in order that the grooved bar Q. attached to the cord H. or an expanded portion of the cord such as a knot, may engage therewith.

The positive and negative wires are attached to terminals secured to the lamp frame in the ordinary manner, and in any convenient position, and when the full strength of the electric current is transmitted through the coil of the solenoid D. the plunger or core E. of the same is raised to the full height, thereby operating the lever L. accordingly and by the cord H. being attached to the opposite end of lever L. and after passing over the pulley P. in the groove G. is secured to the lever L'. by which tension is put upon the cord H. and spring S. by the cord raising the last named lever. When the end of lever L'. is raised in the manner described, the grooved bar Q. or an expanded portion of the cord H. engages with the fluted or milled portion G'. of compound groove, and at the same time moves the pulley P. some distance in the direction of curved arrow, thereby operating the cord O. resting in the expanded portion of the compound groove in the same direction, thus moving the carbons B and C. apart and thereby forming the arc. The upper carbon holder B'. is heavier than the bottom carbon holder C' and when electric current is switched off the lamp, the carbons in consequence come together automatically by gravity, but when the current is switched on, the carbons are



separated a distance in proportion to the strength of the electric current or electro magnetic influence in the coil of the solenoid, so that as the carbons B and C. are consumed, 5 the arc or space between the two carbons becomes longer, therefore the resistance to the electric current passing from one carbon to the other becomes greater, thereby reducing the strength of the current in the solenoid D. 10 thus allowing the plunger or core E. to descend and operate the levers L and L'. in a downward direction, a distance in proportion to the reduced magnetic influence in the coil of the solenoid D. When the strength of the 15 current or electro magnetic influence in the solenoid D. is reduced so as to allow the lever L'. to rest upon the adjustable stop K. the tension and therefore the grip of the cord H. in the groove G. is reduced so that the positive en- 20 gagement of the grooved bar Q. with the flutes at G'. is withdrawn, thus liberating the pulley P. to such an extent that by the top carbon holder and carbon B. being heavier than the bottom carbon holder and carbon C. 25 they are allowed to approach each other, and by the reduction and adjustment of the distance between the carbons to thus maintain the arc. By the reduction in the distance between the carbons in the manner described 30 the electro magnetic influence in the solenoid is again increased, causing the plunger or core E. to rise and again operate the levers L and L'. in the manner as before described such a distance that the tension of the cord H is 35 increased, thus gripping the pulley P and causing the grooved bar Q. or its equivalent on the cord H. to engage with the fluted or milled portion G'. by which means the arc or distance between the carbons is being con- 40 tinually adjusted and a steady and regular light maintained.

What I claim is—

1. In combination, in an arc lamp, the upper and lower carbon holders, the pulley, the 45 suspending cord connected to the carbon holders and passing over the said pulley, the solenoid, the lever L, connected to the core

thereof, and the brake band connected to the lever and embracing the pulley, substantially as described. 50

2. In combination, in an arc lamp, the upper and lower carbon holders, the pulley, the suspending cord connected to the carbon holders and passing over the said pulley, the solenoid, the lever L, connected to the core 55 thereof, and the brake band connected to the lever and embracing the pulley, said brake band having an enlarged portion to engage the pulley, substantially as described.

3. In combination, in an arc lamp, the upper and lower carbon holders, the pulley having the deep groove G, and the outer portion G', the suspending cord connected with the carbons and passing over the pulley in the outer portion G' thereof, the lever L, the so- 65 lenoid having a core connected thereto and the brake band connected to the lever and passing around the pulley in the deep groove thereof, substantially as described.

4. In combination, the upper and lower carbon holders, the suspending cord, the pulley having an outer portion G' to receive the said cord and having a deep groove G, the lever, the solenoid having its core connected thereto, and the brake band connect- 75 ed with the lever and passing around in the deep groove of the pulley said band having an enlarged portion thereon, substantially as described.

5. In combination, the carbon holders, the 80 suspending cord therefor, the pulley for said cord, the lever L, the solenoid having its core connected thereto, the lever L' under spring tension and combined with the lever L, and the brake band connected at one end with the 85 lever L, and at the other end with the lever L', substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

F. T. SCHMIDT.

Witnesses:

JNO. GILL,

E. G. RHODES.