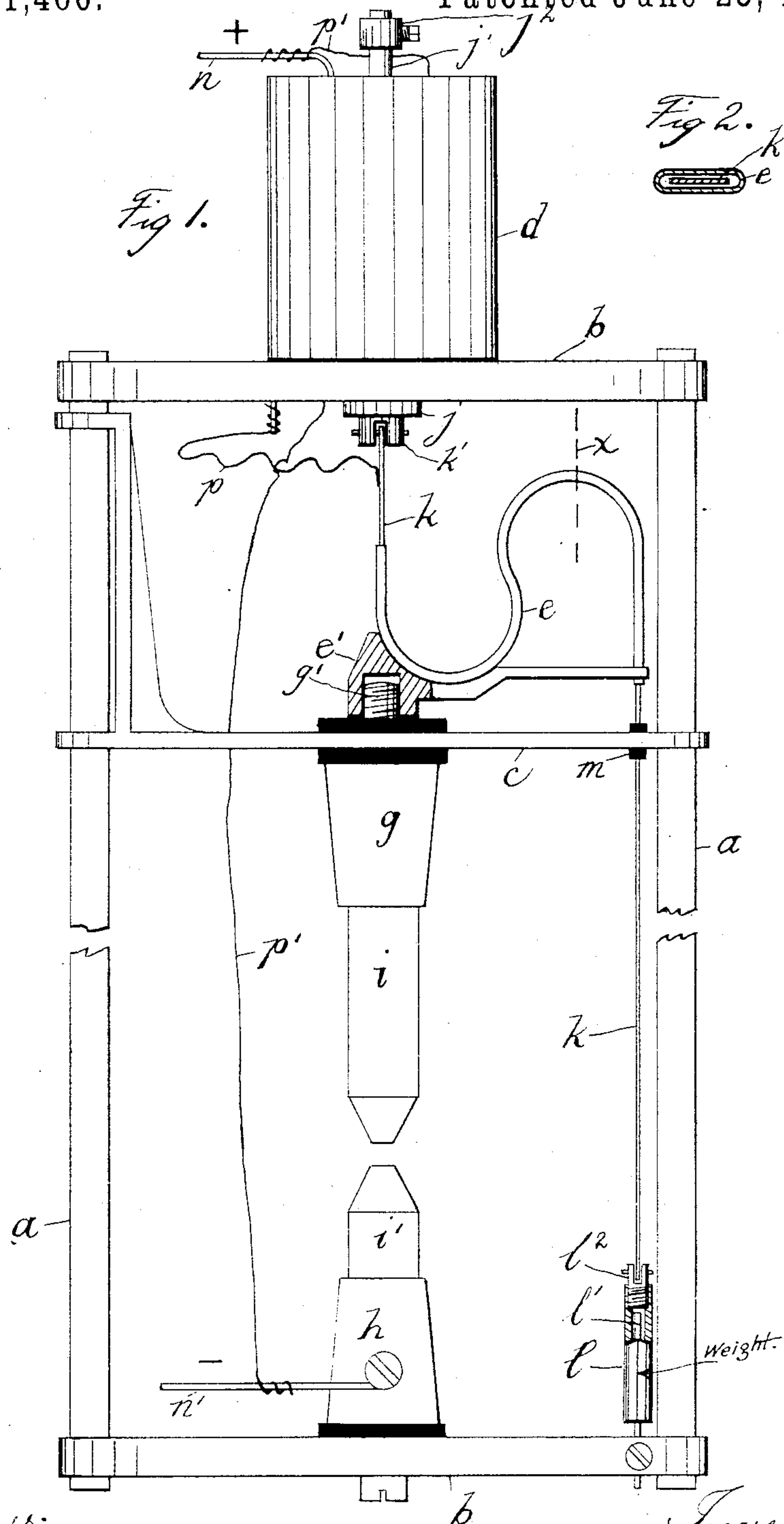


(No Model.)

A. W. SMITH.
ELECTRIC ARC LAMP.

No. 541,460.

Patented June 25, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

ALBERT W. SMITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 541,460, dated June 25, 1895.

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To all whom it may concern:

Be it known that I, ALBERT W. SMITH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented an Improvement in Arc Lamps, of which the following is a specification.

The object of this invention is to provide a cheap, simple, and reliable arc lamp.

To this end the invention consists of a coiled or bent tube or other tortuous passage secured to the movable carbon support, and a flexible metallic ribbon passing through said tube or passage, one end of said ribbon being connected to the lamp mechanism and receiving motion therefrom, while its other end is weighted to cause the ribbon to bind in said tube or passage.

In the drawings herewith, Figure 1 is a side view. Fig. 2 is a section on line x , Fig. 1.

a a are side rods and b b are tie pieces forming the lamp frame.

c is the movable carbon support sliding on rods a a .

d is a solenoid secured on upper tie piece b . i is a bent tube brazed to support i' .

g is the movable carbon holder having screw g' screwing into support e' , thus securing both holder g and tube e to the movable carbon support c .

h is the fixed carbon holder.

i is the movable carbon, and i' is the fixed carbon.

j is a solenoid core having screwed into it the stem j' , on which is the collar j^2 , adapted to retain core j against the action of gravity.

k is a flexible metallic ribbon passing through tube e . The upper end of ribbon k is secured to the insulating nipple k' , which is secured to core j . To the lower end of ribbon k is secured the tension weight l , guided on adjustable pin l' . The rubber nipple l^2 insulates weight l from ribbon k .

m is an insulating bushing through which the ribbon k passes freely, and serves to insulate it from movable support c .

The circuit through the lamp is as follows: Beginning at positive terminal n it passes through solenoid d , then by way of flexible connection p to ribbon k , to tube e , to upper carbon holder g , through carbons i and i' , and out at negative terminal n' .

The operation of the lamp is as follows:

When the lamp is out of action the core j drops down until retained by collar j^2 . The weight l comes to rest on the top end of pin l' , thus removing all tension from ribbon k , when carbon i and its attachments descend under the action of gravity until carbon i comes into contact with and rests on carbon i' . If now the lamp is switched into circuit, the core j is drawn up and with it ribbon k , until the tension weight l is lifted from pin l' , when by reason of the friction caused between ribbon k and tube e by the weight l , the entire movable support c and its attachments are lifted until carbons i and i' are sufficiently separated to form the arc. As the carbons are consumed and the arc lengthens, more current flows through shunt circuit $p' p'$, weakening solenoid d , when core j gradually descends until weight l comes partly or wholly to rest on top of pin l' , thus partly or wholly removing the tension on ribbon k and consequently the friction between ribbon k and tube e , and thus permitting the movable carbon and its attachments to descend by gravity the necessary amount, and thus maintain a constant arc length.

In Fig. 2 is shown a section of tube e on line x , Fig. 1, showing the form of cross section of tube e .

In addition to causing the feed of the carbons, ribbon k also performs the function of conveying the current to movable carbon i , thus avoiding the use of a flexible conducting cord, or other devices for this purpose.

With many lamps now in use there is considerable delay in the feeding of the carbons. This is due to the fact that at the moment of feeding a considerable portion of the mechanism comes to rest against a stop or other device, thus causing what is termed "holding up," and eventually overfeeding of the carbons. In my lamp the small weight l is the only thing that comes to rest in the feeding position, and as it is very small it causes no "holding up," by reason of its weight being removed from the lamp mechanism.

Another defect common to most lamps now in use is uneven and jerky feeding, causing unsteadiness of light, and great variation of circuit resistance. In my lamp the feed is

very gradual and practically continuous, there being a gradual release of the support *c*. As weight *l* touches pin *l'*, jerky motion or over-feeding is entirely prevented.

5 It is obvious that my invention can be used in connection with any form of lamp mechanism, it being only necessary to obtain an up and down movement of ribbon *k*.

10 It is obvious that a twisted cord or small chain can be used in place of ribbon *k*, also that the tube *e* may be coiled into a spiral or bent into other zigzag forms than that shown. It is also obvious that the office of weight *l* can be equally well performed by a suitable 15 spring. The essential principle or spirit of my invention however consists in the use of a flexible feed ribbon engaging with a retarding device on the movable carbon support, and means for varying the tension of said 20 ribbon.

What I claim as my invention is—

1. In an arc lamp, a flexible feed ribbon, engaging with a retarding device on the movable carbon support, and means for impart- 25 ing an up and down movement to said ribbon, and also means for varying the tension on said ribbon, as set forth.

2. In an arc lamp, a flexible feed ribbon passing through a bent tube on the movable 30 carbon support, and means for imparting an up and down movement to said ribbon, and also means for varying the tension on said ribbon, as set forth.

3. In an arc lamp, a flexible feed ribbon passing through a tortuous passage on the 35 movable carbon support, and means for imparting an up and down movement to said ribbon, and also means for varying the tension on said ribbon, as set forth.

4. In an arc lamp, a flexible feed ribbon en- 40 gaging with a frictional retarding device on the movable carbon support, and means for imparting an up and down movement to said ribbon, and also means for varying the tension on said ribbon as set forth.

5. In an arc lamp, a flexible feed ribbon en- 45 gaging with a frictional gripping device on the movable carbon support, and means for imparting an up and down movement to said ribbon, and also means for varying the ten- 50 sion on said ribbon, as set forth.

6. In an arc lamp, a flexible feed ribbon at- 55 tached to, and adapted to receive movement from a core controlled by a solenoid in the lamp circuit, a bent tube or tortuous passage on the movable carbon support through which the feed ribbon passes, and a tension weight at- 60 tached to the lower or free end of the feed ribbon, and means for detaining said weight to cause a feed of the movable carbon, as set forth.

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Witnesses:

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