

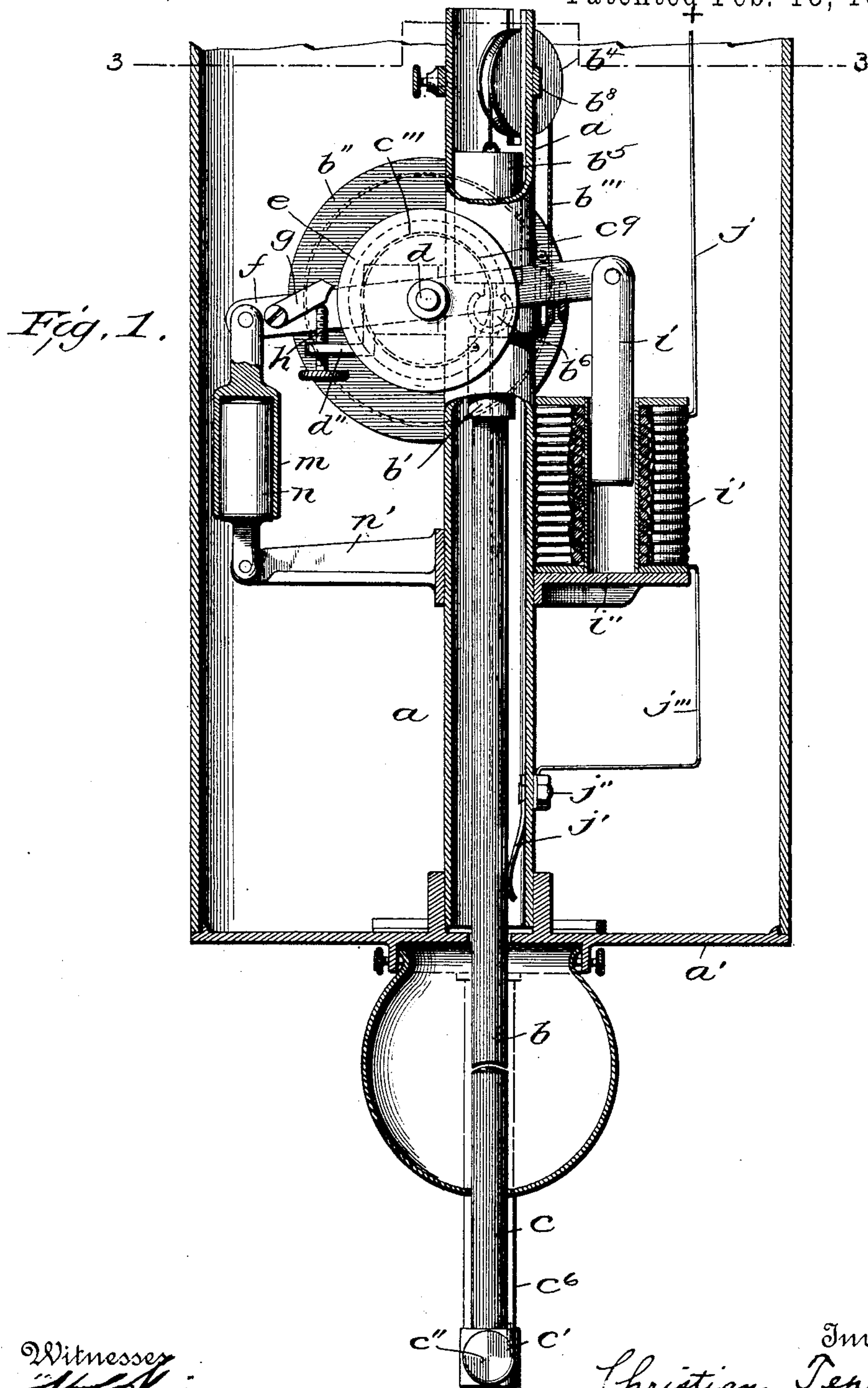
(No Model.)

3 Sheets—Sheet 1.

C. TEPEL.
ELECTRIC ARC LAMP.

No. 599,305.

Patented Feb. 15, 1898.



Witnesses

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R. H. Warfield.

Inventor:

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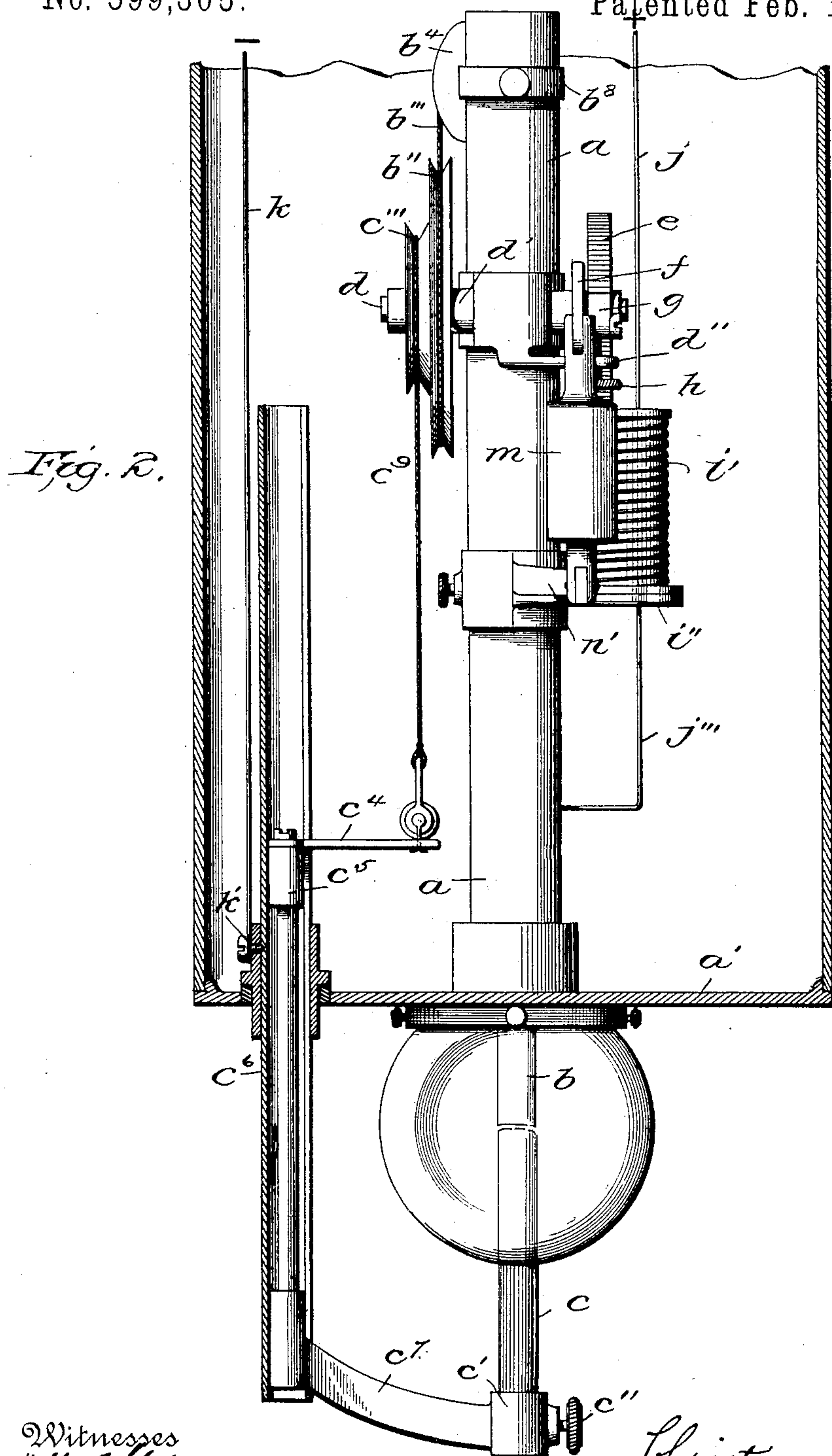
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C. TEPEL.
ELECTRIC ARC LAMP.

No. 599,305.

Patented Feb. 15, 1898.



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(No Model.)

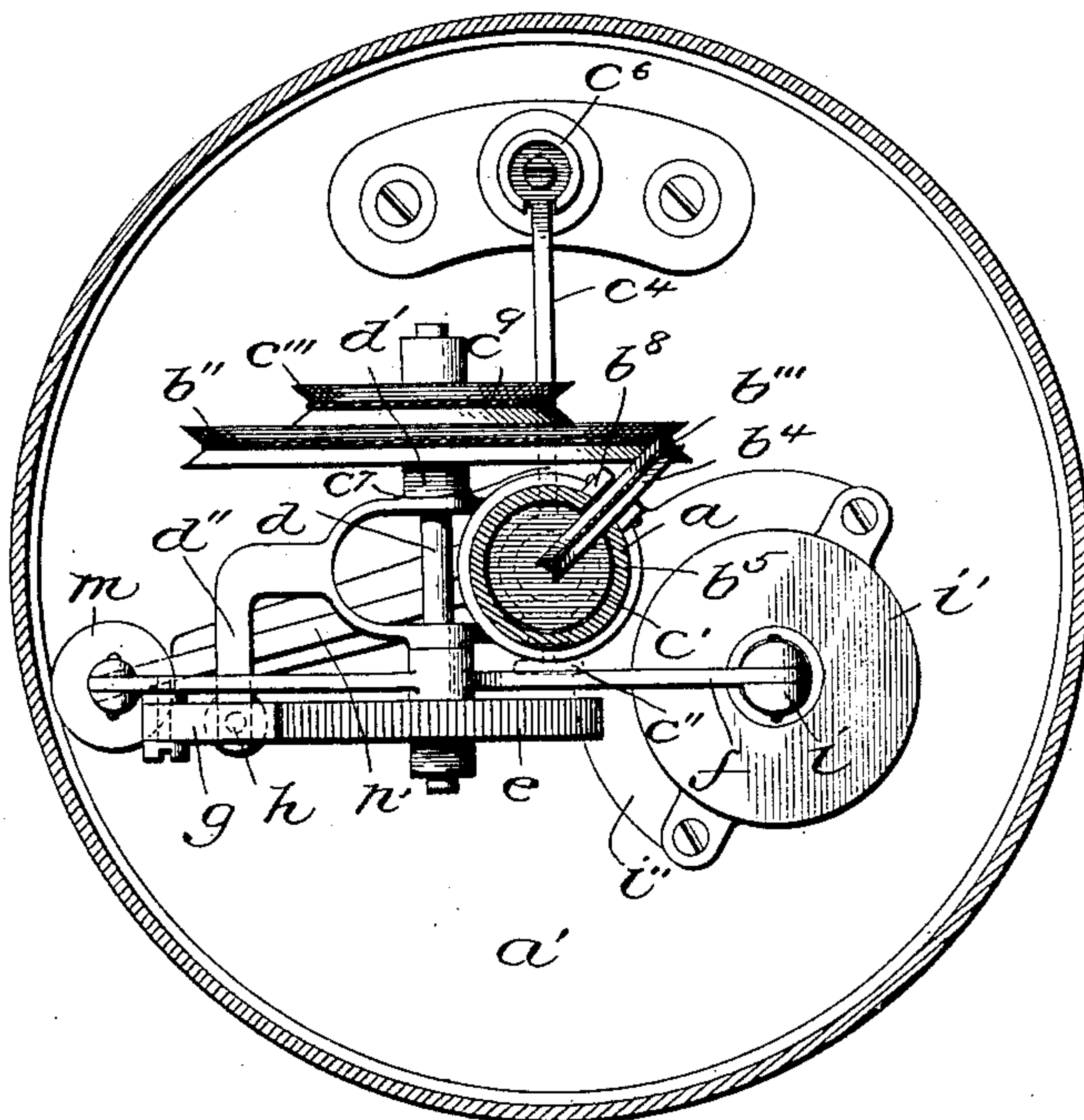
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Fig. 3.



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UNITED STATES PATENT OFFICE.

CHRISTIAN TEPEL, OF BENNETT, PENNSYLVANIA, ASSIGNOR TO THE
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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 599,305, dated February 15, 1898.

Application filed March 10, 1897. Serial No. 626,865. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN TEPEL, a citizen of the United States, residing at Bennett, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Arc-Lamps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to means, in an electric-arc lamp, for regulating the adjustment of the carbons and to automatically establishing the arc by means of the current when turned on and to maintain the same as the carbons are consumed.

The object of this invention is to produce a simple and reliable feed mechanism which will perform its work smoothly, responding promptly, yet gently, to changes in the carbons through consequent changes in the resistance to the electric current passing through the same.

A further object of my invention is to combine with the other features that of maintaining the arc at one point, whereby the lamp can be used with greater facility for head-lights, search-lights, and similar devices.

To this end my invention consists in certain novel constructions and combinations of parts, which will be found recited in the appended claims.

The drawings which accompany and form part of this specification illustrate an embodiment of the invention.

Figure 1 represents a sectional front elevation of the lamp, showing the position of parts when it is not in operation. Fig. 2 represents a sectional side elevation of the lamp, and Fig. 3 a horizontal section taken substantially on the line 3 3 of Fig. 1.

The framework of the lamp is of any well-known or suitable construction, including a central tubular support or column *a*, with a globe-supporting head *a'* at the lower end of it, and appropriate brackets secured to it at

suitable points to accommodate the working parts, hereinafter to be described.

The carbons *b* and *c* are arranged end to end, as commonly practiced, and are clamped or otherwise secured in holders *b'* and *c'*, which are connected with the feed mechanism, as hereinafter explained. The upper carbon extends into the column *a*, and its holder is in the form of a clasp *b'*, embracing its upper end. The lower carbon rests in a socket *c'*, which constitutes its holder and in which it is clamped by a screw *c''*.

Proceeding now to the feed mechanism, which is associated with these carbon-holders, the letter *d* designates a shaft which is journaled in a bearing *d'*, secured to the column *a*, and has affixed to it at one side of the bearing a double pulley, composed of large and small sections or members *b''* and *c'''*. To the periphery of the larger section there is secured a cord, strap, or other flexible device *b'''*, which extends around or winds upon the pulley from right to left and is carried up to and over a small idle-pulley *b⁴*, journaled in a bracket *b⁸*, clamped on the upper end of the column *a*. The said cord has its end which passes into the column connected with a counterbalancing-weight *b⁵*, arranged to be guided in the column and joined by a ball-and-socket joint *b⁶* with the upper-carbon holder *b'*.

Reverting now to the double pulley, its smaller section *c'''* has a cord, strap, or like flexible device *c⁹* fastened to its periphery and winding thereon from left to right and depending therefrom for attachment to an arm *c⁴*, rigidly attached to and projecting laterally from the upper end of a rod *c⁵*, which is fitted to slide vertically in a slotted tube *c⁶*, supported by the head *a'* and extending above and below the same. The lower-carbon holder is at the end of an arm *c⁷*, which extends laterally from and is virtually a part of the rod *c⁵*.

The shaft *d*, hereinbefore mentioned, has secured to it in the opposite side of the bearing *d'* to the double pulley a wheel *e*, whose periphery is serrated or otherwise formed for clutching purposes, and a lever *f* is loosely mounted on the shaft adjacent to the said wheel and carries a dog *g*, pivoted to it and formed at its free end for engaging the ser-

rated periphery of the wheel *e*. The shaft-bearing *d'* has an arm *d''*, which extends under the lever *f* and receives an adjusting-screw *h*, serving as an abutment for the dog *g* to come against when the dog-carrying arm of the lever moves downwardly. Thus under this direction of movement of the lever the dog is disengaged from the wheel, while under the reverse direction of movement of the lever the dog drops into engagement with the periphery of the wheel and by such engagement turns the wheel. The arm of the lever extending on the opposite side of the pivot to the dog has jointed to it a core *i*, which enters the bore of an electromagnet or solenoid *i'*, supported upon a bracket *i''* on the column *a* and embraced in the lamp-circuit, the wiring being as follows: Wires *j* and *k* are connected with the line, and the wire *j* connects with one end of the magnet-coil, while the wire *k* connects with the binding-post *k'* on the tube *c'* and is thus in electrical connection with the lower carbon, the intervening contacting parts being of conducting material. The upper carbon is in electrical connection with the magnet through a spring contact-piece *j'*, fastened to the column *a* in the inside and bearing against the carbon, a binding-post *j''*, associated with said spring, and a wire *j'''*, extending between the binding-post and the magnet-coil. The end of the dog-carrying arm of the lever has jointed to it a counterbalance *m* in the form of an inverted tubular socket which has a close fit over a core *n*, jointed to the end of a bracket *n'*, secured to the column *a*, the object being to secure a cushioning effect to obviate sudden action of the feed mechanism.

The operation of the above mechanism may be described as follows: When trimmed and ready for use, but not in circuit, the two carbons rest in contact with each other, as shown in the drawings. Upon the current being turned on the consequent energizing of the magnet *i'* causes the core *i* to be drawn downwardly, thus producing depression of the lever-arm connected with said core and the elevation of the dog-carrying arm. This results in the dog *g* dropping into engagement with the clutch-wheel *d*, so that as the upward movement of the lever-arm continues the wheel will be turned in the direction of the hands of a clock. This turning of the wheel is manifestly accompanied by a corresponding turning of the double pulley, and the consequent winding and unwinding of the cords *b'''* and *c'* on their respective sections of said pulley raises the upper carbon and lowers the under carbon, and the arc is obtained. When the distance between the ends of the carbon becomes excessive, the increased resistance to the current caused thereby diminishes the power of the magnet or solenoid *i* and permits the counterbalancing-weight *m* to move the lever *f*, lowering its dog-carrying arm and thereby disengaging the dog from the clutch-

wheel and permitting the weight *b⁵* to assert itself and bring the carbons toward each other through the medium of the cords and pulley connections just described. Should the current become discontinued, the same action would ensue as just described, but the carbons would continue to move toward each other until they met. The difference in diameter between the two sections of the pulley is to be noted as well calculated to insure permanency of location of the arc by differential movements of the carbons.

The lamp here shown and described can be used either with an alternating or a low-tension current. It can, moreover, be readily adapted to a high-tension current by substituting for the socket *m* a shunt-magnet. It is also evident that the invention here disclosed is capable of embodiment in other forms than those shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric-arc lamp, the combination with carbon-holders movable toward and from each other, of a pulley, suitable connections between the same and the carbon-holders respectively, for producing opposite movements of the latter by the turning of the pulley, a clutch-wheel fast with the pulley, a lever pivoted concentric with the clutch-wheel, a dog pivoted to one end of the said lever and arranged to engage the periphery of the clutch-wheel, an abutment for said dog to encounter under one direction of movement of the lever to free said dog from its wheel, an air-cushion on the same arm of the lever, an electromagnet in the lamp-circuit and a core in said magnet connected with the opposite side of the lever.

2. In an electric-arc lamp, the combination with vertically-movable carbon-holders, a double pulley, oppositely-winding flexible connections between the sections of said pulley and the carbon-holders respectively, a clutch-wheel fast with said pulley, a lever extending horizontally across to opposite sides of the carbon-holders and pivoted concentrically with the clutch-wheel, a dog pivotally mounted on said lever for engagement with the periphery of the clutch-wheel under one direction of movement of the lever, an abutment for said dog to disengage it from the wheel under the opposite direction of movement of the lever, an electromagnet in the lamp-circuit, a core in said magnet and connected with one arm of the lever, and counterbalancing means connected with the opposite arm of the lever, and a vertical carbon-holder, substantially as described.

In witness whereof I affix my signature in presence of two witnesses.

CHRISTIAN TEPEL.

Witnesses:

ED. TILLMANN,
WILLIAM WILKINS.