(No Model.)

3 Sheets—Sheet 1.

J. R. STEERS.

ELECTRIC ARC LAMP.

No. 485,895. Patented Nov. 8, 1892.

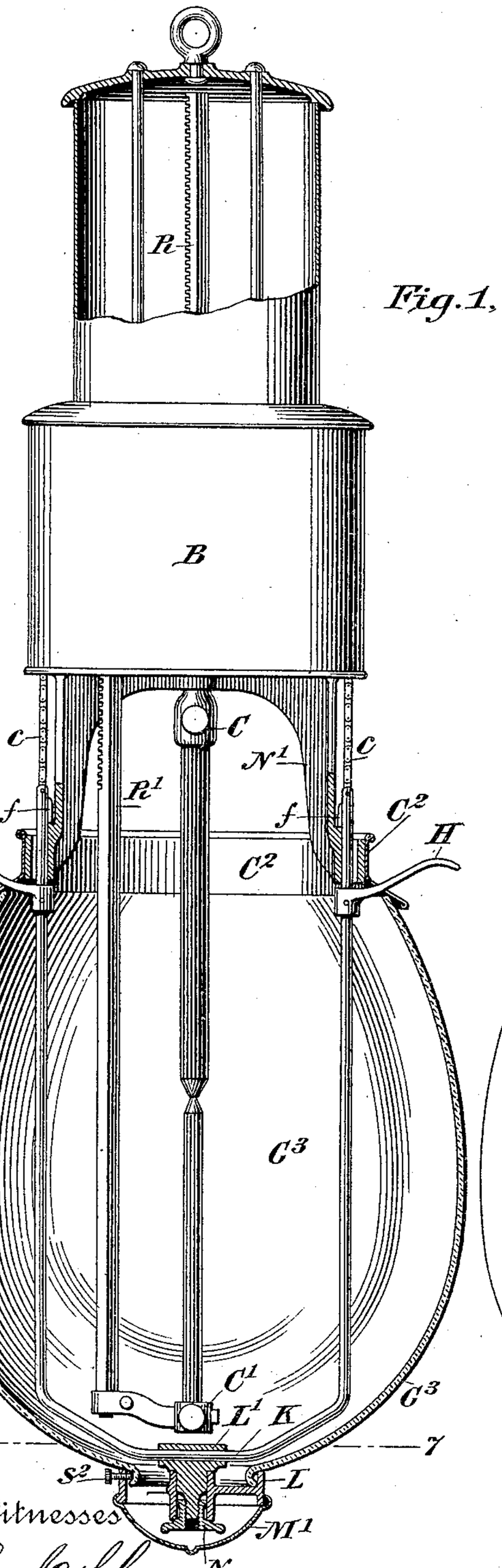

Fig. 1.

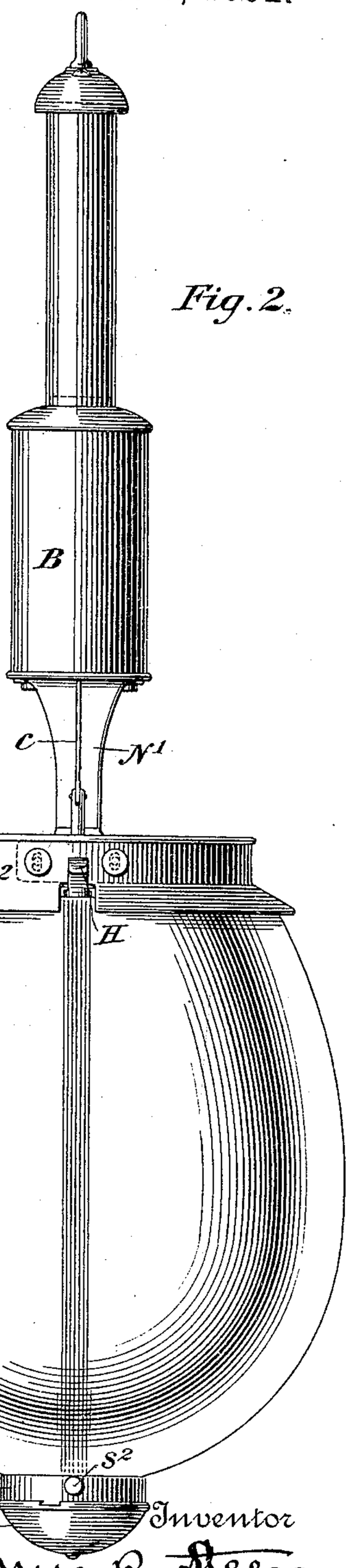

Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

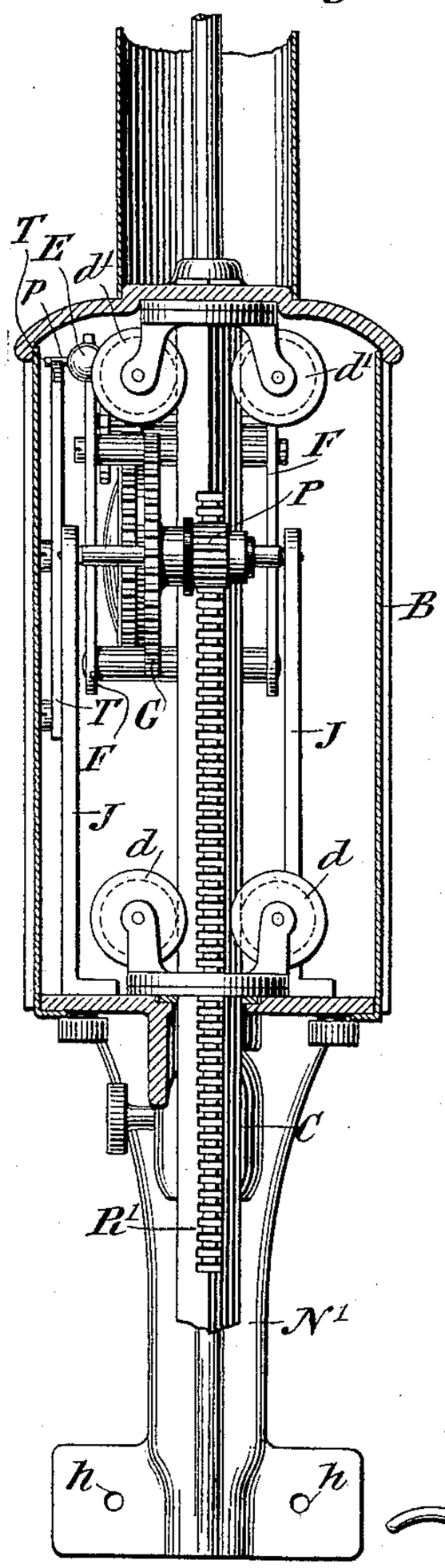

Fig. 3.

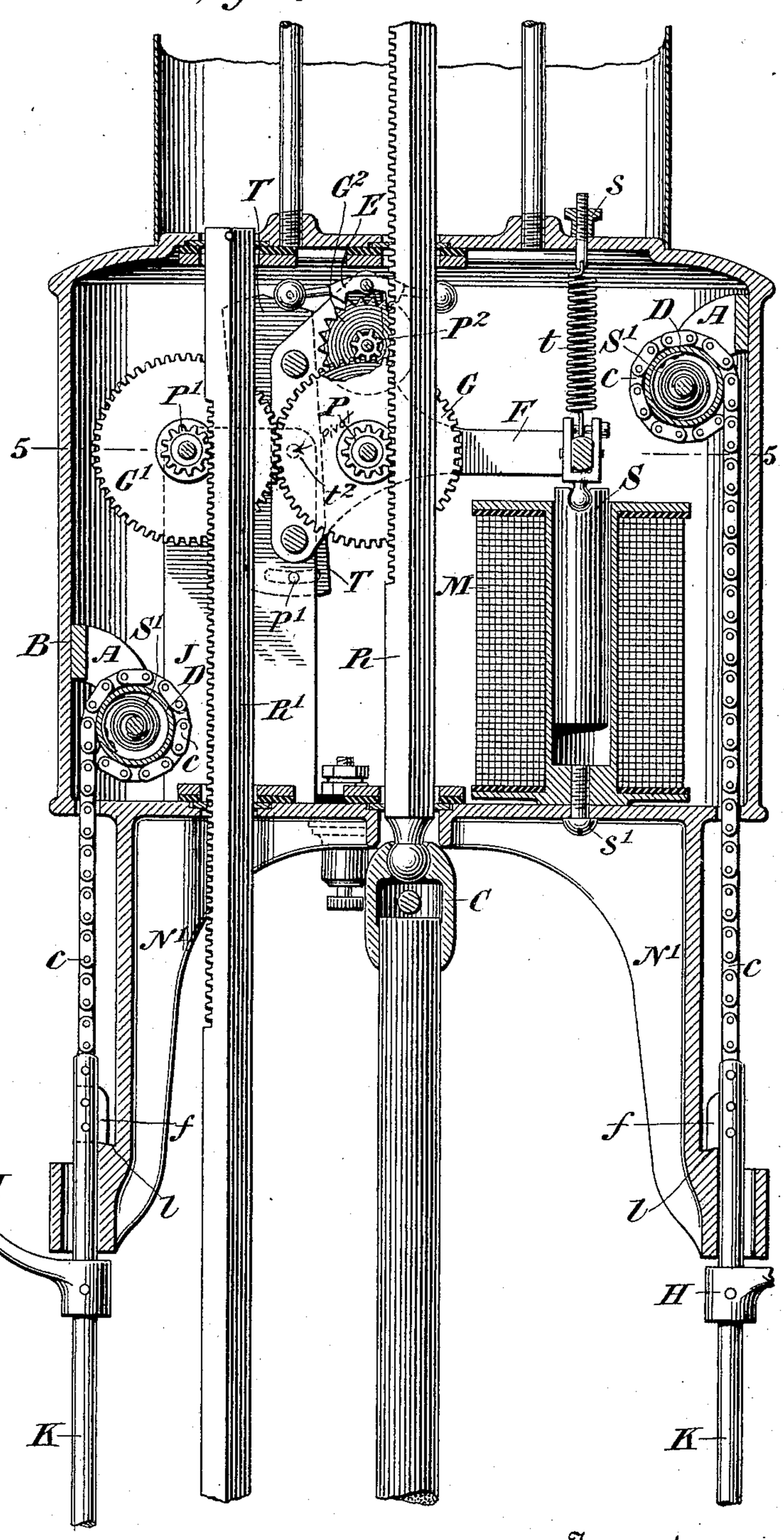

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Fig. 5.

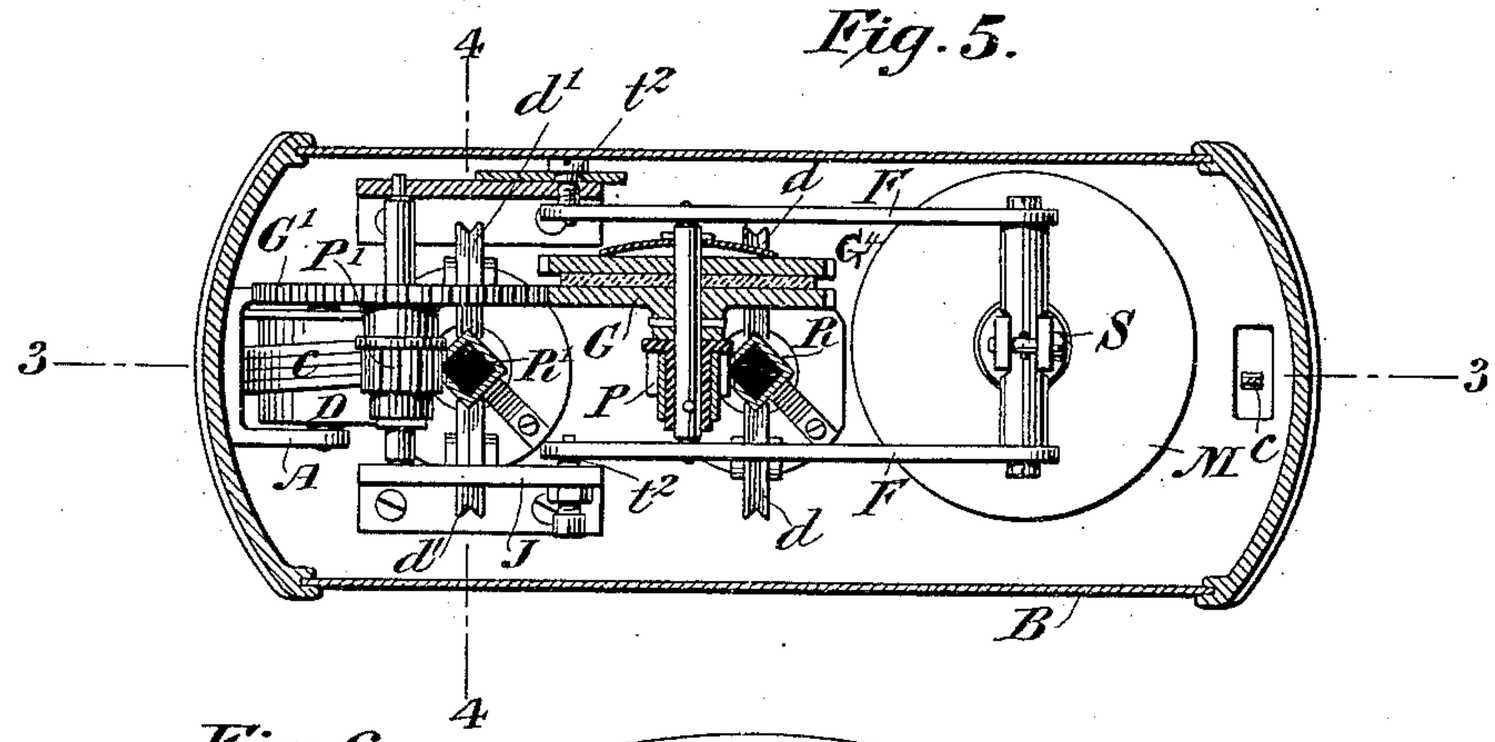


Fig. 6.

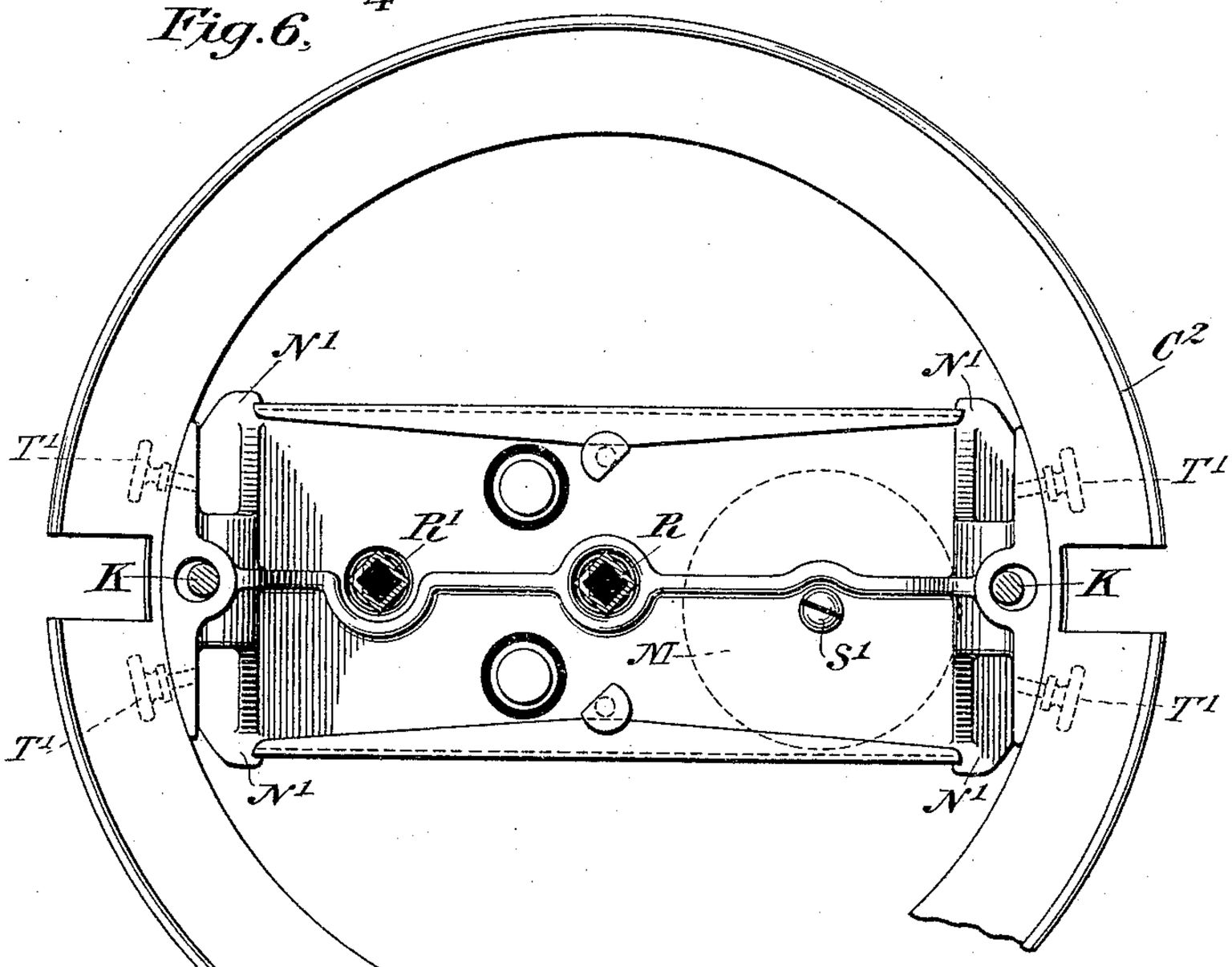
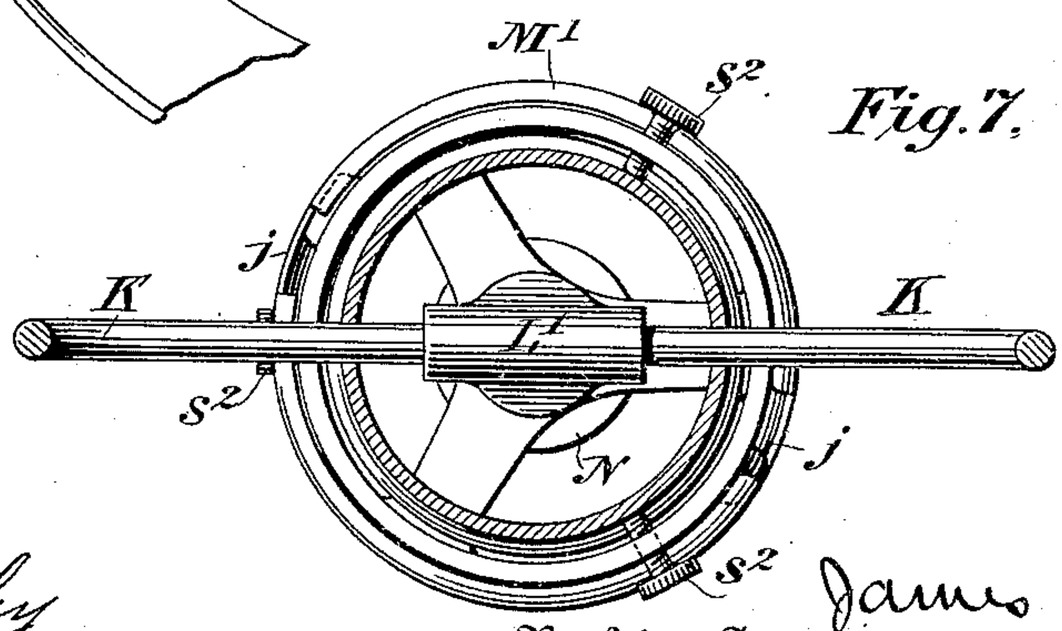


Fig. 7.



Witnesses
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H. W. Lloyd.

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By his Attorney
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UNITED STATES PATENT OFFICE.

JAMES R. STEERS, OF NEW YORK, N. Y.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 485,895, dated November 8, 1892.

Application filed May 28, 1892. Serial No. 434,698. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. STEERS, a citizen of the United States, residing at New York, in the county and State of New York, have made a new and useful invention in Electric-Arc Lamps, of which the following is a specification.

My invention is directed particularly to that type of electric-arc lamps known as "focusing-lamps," in which the carbons or electrodes are both given direct or positive motion toward each other, so as to maintain the position of the arc at a fixed point.

My invention has for its objects, first, the production of a lamp of the type named in which the operative parts shall be as few and as simple as possible; second, the arrangement of the several parts in as compact a manner as possible and so that they, together with the carbons or electrodes, may be fully protected from the weather and easily accessible at all times; third, the arrangement of a globe-holder in such manner that the globe may be quickly and easily withdrawn from about the carbons and as quickly and easily restored; fourth, to devise a simple means in the nature of a spark-cup secured to the bottom of of the globe and rendered easily detachable. These several objects are accomplished with the mechanism herein described, and particularly pointed out in the claims at the end of the following specification.

In order that my invention may be fully understood by those skilled in the art to which it relates, reference is had to the accompanying drawings, in which—

Figure 1 is a side elevational view of an arc lamp shown partly in section and embodying my improvements. Fig. 2 is a similar side elevational view as seen looking at Fig. 1 from left to right. Fig. 3 is a vertical sectional view taken through Fig. 1 on a plane parallel with the face of the drawings, the globe and lower carbon not being shown and the top of the lamp being broken away. (See, also, the section-lines 3 3, Fig. 5.) Fig. 4 is a similar vertical sectional view taken through Fig. 2, the upper and lower portions of the lamp not being shown. (See, also, the section-line 4 4, Fig. 5.) Fig. 5 is a horizontal sectional view taken on line 5 5, Fig. 3. Fig. 6 is a plan view as seen looking at Fig. 3 from the bottom toward the top of the drawings, the upper globe-supporting ring being in position. Fig. 7 is a cross-sectional view taken through Fig. 1 on line 7 7 and as seen looking from the top toward the bottom of the drawings.

Referring now to the drawings in detail, in all of which like letters of reference represent like parts wherever used, B is the housing of the lamp, of oblong shape, provided with an upper or extended portion secured thereto by bolts and having a supporting loop or eye, and N′ N′ are downwardly-projecting side supports adapted to sustain the globe G^3 and its upper or protecting collar or ring C^2.

C and C′ are the carbon-holders, secured to rectangular carbon-supporting racks R and R′, said racks being held in guide-rolls *d d d′ d′* at the bottom and top of the housing, as clearly shown in Figs. 4 and 5. The rack R and its attached parts are considerably heavier than is the rack R′ and its corresponding parts in order that its surplus weight may control the advancement of the two carbons, said racks being geared, respectively, with pinions P and P′, operatively connected together through shafting and gear-wheels G and G′, the former journaled in a supporting-frame F, pivoted at one end to upright standards J on pivot-points t^2 t^2, and the latter journaled directly in the same uprights.

P^2 is a pinion, and G^2 an escapement carried by a shaft journaled, also, in the pivoted frame F, said pinion P^2 meshing with a third gear-wheel G^4, carried by the same shaft which supports the gear-wheel G and held in frictional relation therewith by a yielding or elastic washer, as clearly shown in Fig. 5.

E is a forked escapement-pallet journaled, also, in the frame F and adapted to be operated by the escapement-pallet wheel G^2. To one of the arms of the escapement-pallet E is secured a pin *p*, adapted to come into mechanical contact with the beveled end of a tilting plate T, secured to one of the standards J and rendered adjustable by a set-screw *p′*, the function of this pivoted plate being to regulate the length of the arc, as will be described later on.

M is the controlling electro-magnet or solenoid, secured to the inner floor of the housing B by a screw s'.

S is a solenoid-core extending into the solenoid M and pivotally secured at its upper end to the free end of the tilting frame F, t being a retractile spring attached at one end to the free end of the frame F and at the other to the upper or top portion of the housing B, s being an adjusting-nut for regulating the tension of said spring.

G^3 is the globe, and K is a bent sustaining-rod therefor, provided with a sustaining eye or link L', which is screw-threaded at its lower end for a thumb-nut N, which in turn is adapted to sustain the lower or globe-supporting ring L, said ring being provided with a series of thumb-screws s^2, adapted to bear frictionally against the lower curved portion of the globe. (See Figs. 1, 2, and 7.)

M' is a spark-cup having bayonet-joint connections $j\ j$ with the shade-supporting ring L. (See Fig. 7.) The upper ends of the shade-supporting rod K are provided with inwardly-extending hooks f, adapted to rest upon corresponding lugs or projections l at the lower ends of the downwardly-projecting side supports N' N'. These rods extend through enlarged openings in the lower end of the downwardly-projecting side supports N' N' and are attached to chains or cords $c\ c$, running over drums D D, secured on the inner walls of the housing B by brackets A A.

S' S' are spiral springs attached at their inner ends to fixed axes and at their outward ends to the drums D D.

H H are handles or manipulating devices for raising and lowering the globe G^3. The upper globe-ring C^2 is permanently secured in place by thumb-screws T' T' T' T', which enter screw-holes $h\ h$ in the downwardly-projecting side supports N' N'. (See Figs. 4 and 6.) This globe-ring is provided with lateral or side openings for allowing the handles or manipulating devices H H to assume their upper position, as shown in Fig. 1.

The operation of the apparatus is as follows: The controlling or regulating electro-magnet M is preferably in a shunt or derived circuit to the carbons, and the latter are normally separated. Under this condition of affairs the carbons are prevented from approaching each other, inasmuch as the forked escapement-pallet E is in the position shown in Fig. 3, and rests on the beveled end of the tilting plate T. When the current is turned on and the magnet or solenoid M energized, its core S is drawn in, thus placing the spring t under tension and tilting the frame F about its pivot-points until the pallet is released. The weight of the carbon-holders C and C' and their attached parts therefore causes the carbons to approach until they touch, at which time the low-resistance path offered the current through the carbon points momentarily shunts the magnet or solenoid M and allows the spring t to lift the frame F and strike the arc and simultaneously check the escapement-pallet. The arc continues to lengthen until the current is again forced through the solenoid or magnet M and the frame F tilted forward, as before, until the carbons are again released and allowed to approach sufficiently near to again allow the frame F to be tilted under the influence of spring t. This action continues indefinitely, or until the carbons are consumed.

I have shown the upper or positive carbon as of greater dimensions in order to allow for the rapid consumption thereof. It will be understood, of course, that I may use carbons or electrodes of like dimensions by regulating the proportion of the teeth in the gear-wheels G and G' or pinions P and P', so as to feed the upper carbon at the desired speed.

When it is desired to replace the carbons, the attendant grasps the handles H H, forces the upper ends of the rod K to the right and the left, thereby releasing the hooks $f\ f$ from the stops $l\ l$, and by a downward motion causing the globe to pass from under the fixed globe-ring C^2, at the same time causing the chains $c\ c$ to place the spiral springs S' S' in the drums D D under stronger tension, so that when released the globe will return to the position shown in Fig. 1, leaving the entire lamp completely housed. The globe G^3 may be entirely removed for the purpose of cleaning or the like by first removing the spark-cup M' on releasing the bayonet-joint connections $j\ j$ with the lower sustaining-ring L, after which the thumb-nut N is removed, thereby permitting the absolute removal of the globe.

I do not limit myself to the specific details of construction herein shown and described for accomplishing the results enumerated, as many of the details of construction may be departed therefrom without materially avoiding the scope of my claims hereinafter made.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an arc lamp, a pair of carbon-supporting racks, a pair of pinions adapted to mesh with said racks, one of said pinions being carried by a shaft journaled in the frame of the lamp and the other by a second shaft journaled in a pivoted supporting-frame, in combination with intermediate gearing, escapement mechanism, and an adjustable tilting regulating-plate located in the path of the escapement-pallet, substantially as described.

2. In an arc lamp, a pair of carbon-supporting racks and a pinion for each rack, one of which is carried by a shaft journaled in the frame of the lamp and the other by a second shaft journaled in a pivoted frame, said shafting being operatively connected together by intermediate gearing, in combination with an escapement-pallet carried by the pivoted frame and controlled by gear-wheels opera-

tively connected with the aforesaid gearing with a beveled tilting plate lying in the path of a pin borne by the escapement-pallet and means for adjusting said pivoted plate, whereby the length of the arc may be regulated at will, substantially as described.

3. A pair of rectangular-shaped carbon-supporting racks held in position by guide-rolls secured to the body of the lamp, in combination with a pinion for each rack, one of said pinions being carried by a shaft journaled to the frame of the lamp and the other by a shaft journaled in a pivoted frame, gear-wheels uniting the two shafts, an escapement-pallet carried by the pivoted frame and operatively connected to the aforesaid gearing through intermediate gear-wheels, a stop-pin on one end of the escapement-pallet, and a beveled tilting plate located in the path of said pin with an adjustment-screw for regulating the position of the plate, substantially as described.

4. A globe-support consisting of a bent rod secured to the base of the globe and a pair of chains or cords attached to the ends of the rod and to spring-actuated drums in the body of the lamp, substantially as described.

5. A globe-support consisting of a single bent rod attached at its middle to the globe and at its ends to chains or cords passing around spring-actuated drums located in the body of the lamp, in combination with locking and releasing devices, substantially as described.

6. In an arc lamp, a protecting ring or collar for the globe, secured to the body of the lamp, and a globe-holder having vertical sliding sustaining devices operatively connected with spring-actuated drums in the body of the lamp, substantially as described.

7. In an arc lamp, a detachable globe-holder having a sustaining device inside the globe operatively connected with spring-actuated drums in the body of the lamp and a spark-cup detachably secured to the globe-holder beneath the globe, substantially as described.

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Witnesses:
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