No. 617,621. Patented Jan. 10, 1899.

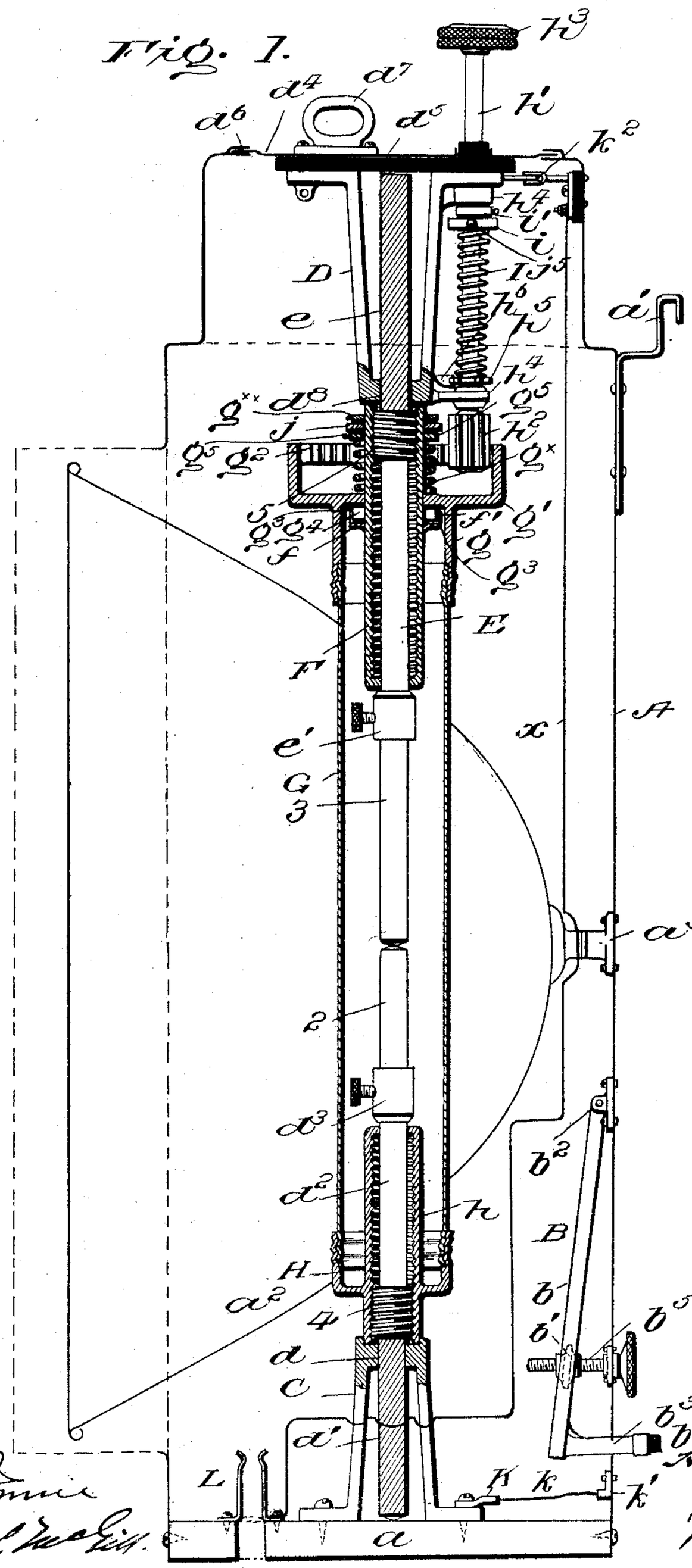
H. P. WELLMAN.

ELECTRIC HEADLIGHT LAMP.

(Application filed Sept. 15, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2

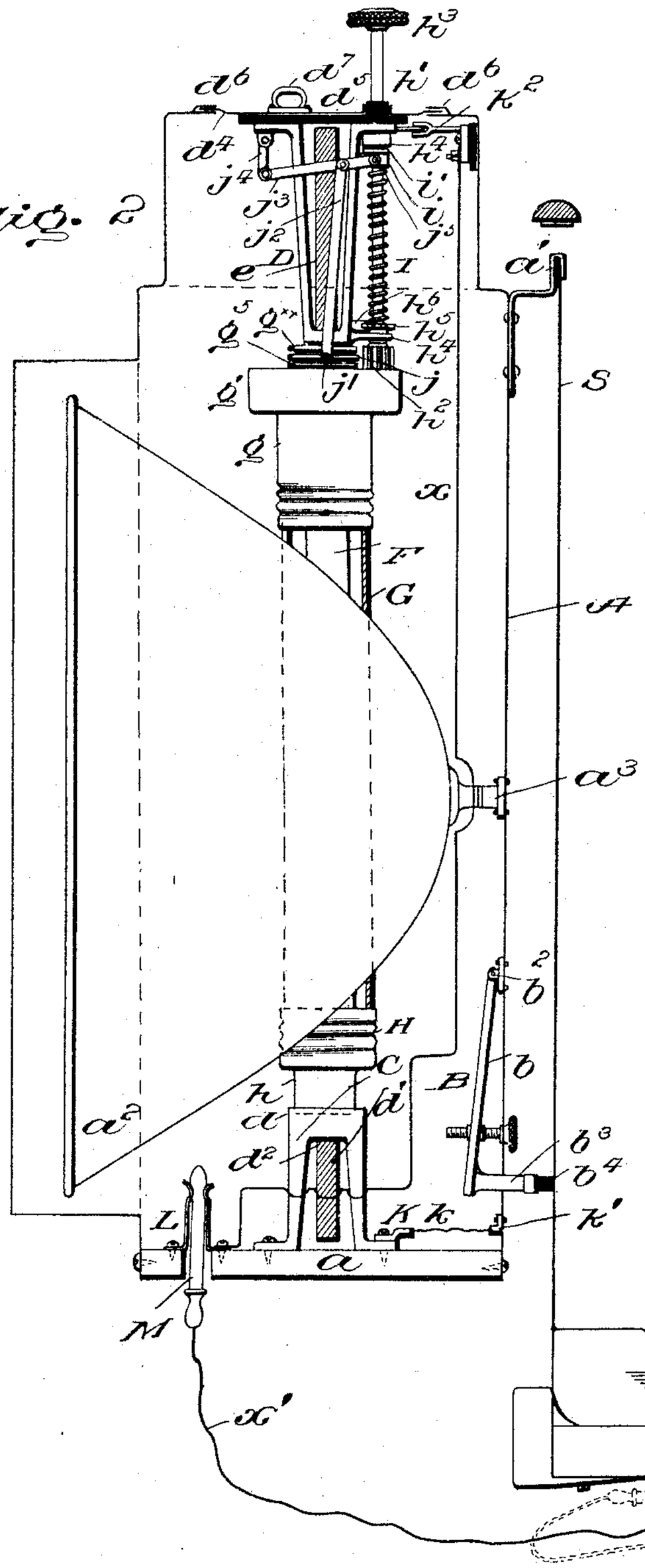

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Fig. 3.

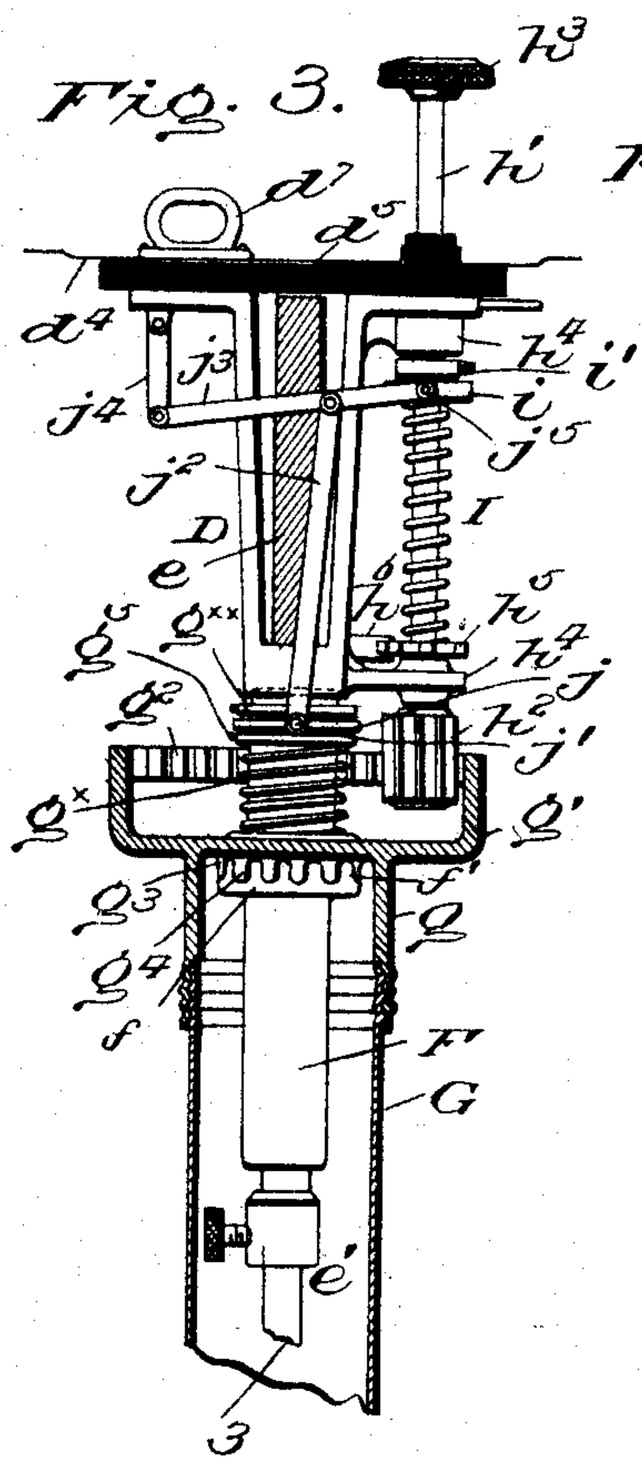


Fig. 4.

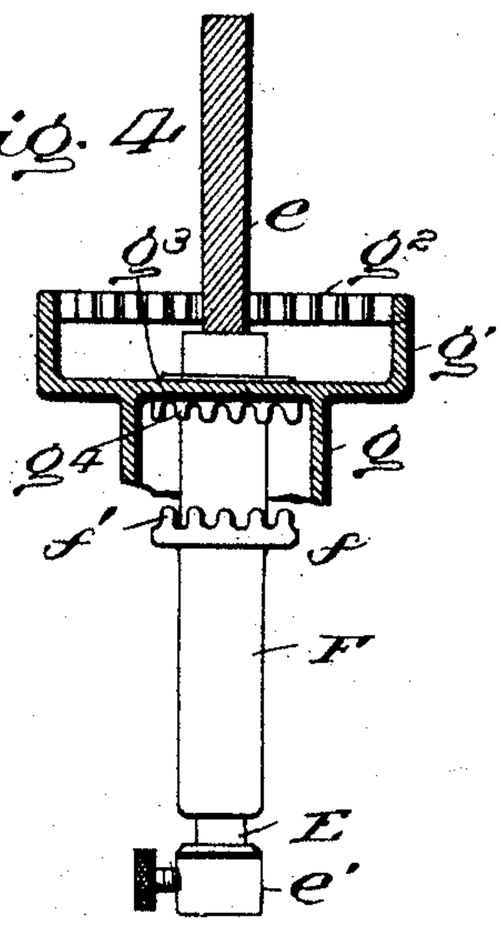


Fig. 5

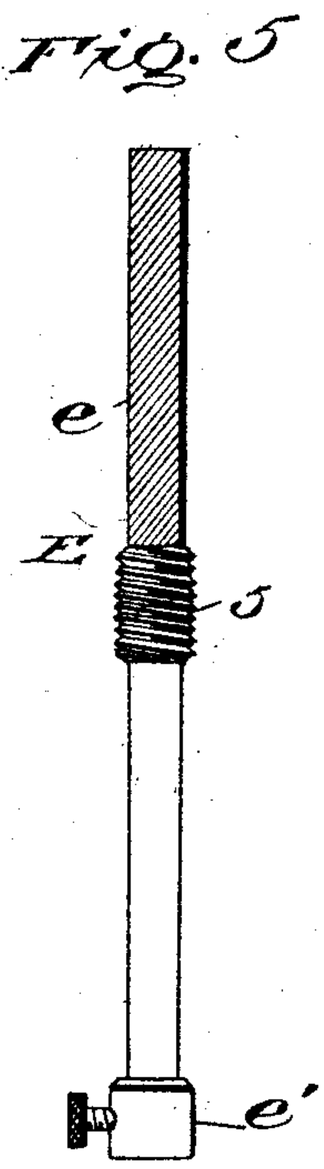


Fig. 6

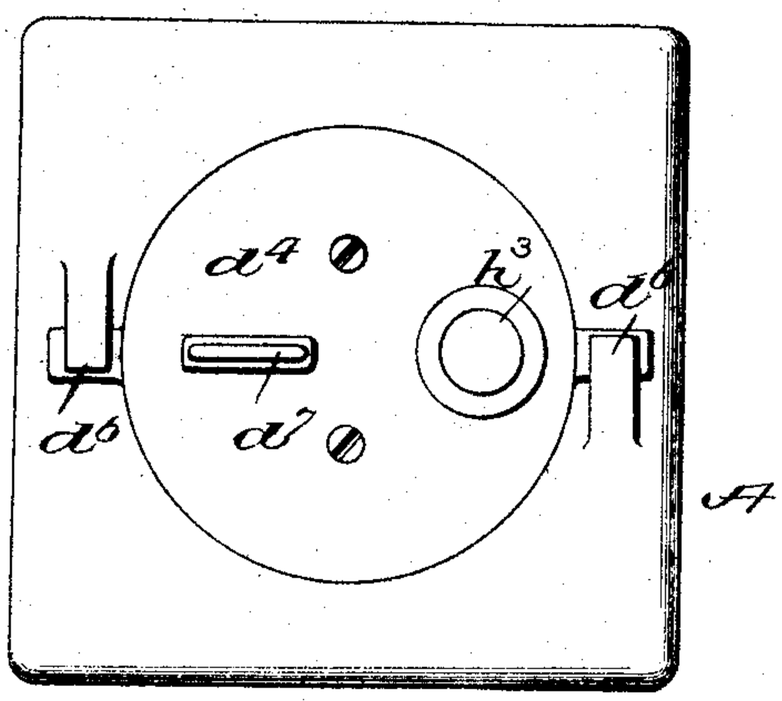
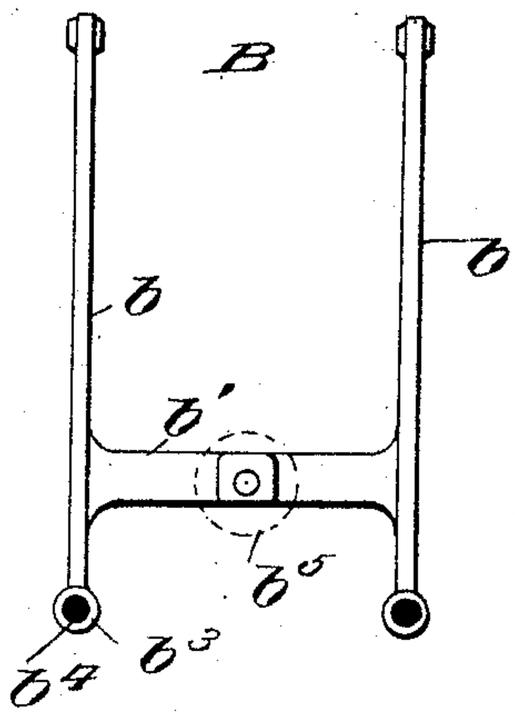


Fig. 7.



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UNITED STATES PATENT OFFICE.

HARLAN P. WELLMAN, OF ASHLAND, KENTUCKY.

ELECTRIC HEADLIGHT-LAMP.

SPECIFICATION forming part of Letters Patent No. 617,621, dated January 10, 1899.

Application filed September 15, 1898. Serial No. 690,999. (No model.)

To all whom it may concern:

Be it known that I, HARLAN P. WELLMAN, of Ashland, in the county of Boyd and State of Kentucky, have invented certain new and useful Improvements in Electric Headlight-Lamps; and I do hereby 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.

This invention contemplates certain new and useful improvements in electrical headlight-lamps.

The primary object of the invention is to provide a lamp of this character with manually-operated mechanism for starting or establishing the arc.

Further objects of the invention are to provide improved means for effecting the relative adjustment of the positive and negative carbons simultaneously, the adjustment of the negative carbon independently of the positive carbon regulating the position of the lamp so that the light-rays may be directed ahead of the car to any desired point, connecting the positive terminal of the lamp to the trolley circuit, and finally to reduce to a minimum the number of working parts for feeding or adjusting the carbons.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a lamp constructed in accordance with my invention. Fig. 2 is a side elevation showing the lamp suspended from the dash of a car, the lamp-casing being indicated only in general outline. Fig. 3 is an enlarged vertical sectional view of the carbon-adjusting mechanism. Fig. 4 is an enlarged detail with parts in section. Fig. 5 is a view of one of the carbon-rods. Fig. 6 shows a top plan view of the lamp-casing. Fig. 7 is a view of the lamp-casing adjuster.

Referring to the drawings, A designates the lamp-casing in its entirety, a the wooden base thereof, and a' two hangers by which the casing is hung or suspended on dash S of a car.

a^2 is a parabolic reflector, which is secured at a^3 to casing A by suitable means, that shown consisting of a threaded lug and a complementary part.

B is a device for adjusting the position of the lamp-casing so as to direct the light-rays to the desired point in advance of the car. It comprises a frame having two longitudinal bars b and a cross-bar b', the former being pivoted at b^2 to the rear wall of casing A. From the lower ends of bars b project angular extensions b^3, to accommodate which holes or openings are formed in casing A. In the extreme outer ends of these extensions are buffers b^4, preferably of rubber, which are designed to prevent scratching or defacing the dash S. The extent to which the buffer ends project beyond the casing is controlled by an adjusting-screw b^5, mounted in said casing and working in a central threaded opening of cross-bar b'. By this means the lamp-casing will hang from the dash at any desired inclination.

To base a is secured a stationary frame C, of skeleton form, having a central squared opening d to accommodate the squared portion d' of a rod d^2, to which latter the negative carbon 2 is secured, being held in a clamp d^3 of said rod. A second but inverted frame D depends from the removable top d^4 of casing a, an insulating-disk d^5 being interposed between said frame and top. This top is held in place by interlocking lugs and ears d^6, and by means of a handle d^7 the top may be readily released for removal. In frame D, which is also of skeleton form, is a central squared opening d^8, which accommodates a squared portion e of a rod E of the positive carbon 3, said rod having a clamp e' for holding said carbon. The carbon-rod d^2 has a central threaded enlargement 4, while the carbon-rod E has a central threaded enlargement 5, the left-hand thread of the latter being cut at a greater angle than the right-hand thread of the former, the variance being about two to one. Beyond this threaded enlargement each rod is rounded or of cylindrical form, terminating at its outer end in the carbon-holding clamp.

F designates a sleeve which incloses the rounded portion of carbon-rod E and is formed with an internal thread with which the threaded portion 5 engages. On the exterior of this

sleeve is a flange f, having upwardly-projected teeth or serrations f'.

G designates the arc-inclosure, which may be made of glass or any other translucent material. At its upper end it is screwed or otherwise secured to a casing g, having an upper cylindrical enlargement g', which latter on its inner surface is formed with teeth g^2 and in its center has an opening to accommodate sleeve F. Surrounding this opening is a flange g^3, having downwardly-projecting teeth or serrations g^4, designed to interlock with the teeth of flange f. This interlocking is ordinarily maintained by a spiral spring $g^\times$ encircling sleeve F and bearing at its ends against casing g and a collar g^5, fast on sleeve F. This spring tends to hold the sleeve F elevated. At its lower end the arc-inclosure G is screwed or otherwise secured to a casing H, which is formed with a central sleeve h, having an internal thread with which engages a threaded enlargement 4 of the negative carbon-rod d^2. The lower end of the sleeve h rests upon the frame C. Both of the carbon-carrying rods being prevented from rotating by reason of their squared portions fitting in corresponding holes in their holding-frames, any revolution of the arc-inclosure and the end casings carried thereby will, by reason of the engagement between the threaded portions of said rods and their inclosing sleeves, effect the adjustment of said rods toward or away from each other. This adjustment of the arc-inclosure, or rather its rotation on its longitudinal axis, is effected by a perpendicular shaft h', on the lower end of which is a pinion h^2, which meshes with the teeth g^2 of casing g. This shaft at its upper end has a milled head h^3 and is held in place by lateral bearings h^4, projecting from frame D. On this shaft is a ratchet-wheel h^5, with which engages a pawl h^6 to serve as a guide to the motorman in adjusting the carbon-rods. The shaft h' is normally held elevated by an encircling spring I, which at its upper end bears against a collar i on said shaft. Immediately above this collar is a second collar i', which is fast on said shaft, and by engaging with the frame D limits the upward movement of said shaft h' under the action of spring I. The pinion h^2 is of such depth that it will always be in engagement with the teeth g^3.

By turning the shaft h' in one direction the two carbons will be fed toward each other, the positive carbon being moved at twice the speed of the negative carbon, thus compensating for the uneven consumption of the carbons and maintaining the electric arc in the focus of the reflector. For this latter purpose it is frequently essential that the negative carbon be adjusted independently of the positive carbon. This is effected by first disengaging the teeth or serrations of the sleeve F from those of the casing g before rotating the arc-inclosure. When this disengagement exists, the rotation of the arc-inclosure acts only upon the negative carbon-rod. To this end, on sleeve F, between the stationary collar g^5 and a second stationary collar $g^{\times\times}$, I place a loose-fitting collar j, having diametrically opposite lateral lugs j', to which are secured the lower ends of two bars j^2, which at their upper ends are pivotally secured to two levers j^3. These levers are pivoted at one end to depending links j^4, which are loosely suspended from frame D. In the drawings I have only shown one of these bars j^2, levers j^3, and links j^4, an exact counterpart thereof being on the other side of frame D. At their outer ends the levers j^3 are loosely secured to laterally-projecting lugs j^5 of the loose-fitting collar i on shaft h'. Hence by depressing shaft h' as against the tension of its spring I the spring g^4 will be compressed by the downward movement of sleeve F, which movement is sufficient to disengage the interlocking teeth or serrations. When the parts are thus positioned, the turning of shaft h' will effect the rotation of the arc-inclosure, and consequently the negative carbon-rod, without rotating or affecting the position of the positive carbon-rod other than that occasioned by the lowered position of its inclosing sleeve. Immediately upon releasing the pressure on the shaft h' the parts will resume their normal position and the sleeve F will be again interlocked with casing g, so that any rotation of shaft h' will effect the simultaneous adjustment of both the negative and positive carbons.

K is the negative terminal of lamp, which is connected by a wire k to lamp-casing A at terminal k'. An automatic contact switch and blade k^2 connects with the inverted frame D when the top of the casing is locked in position. A wire x connects the switch and blade to a spring plug-socket L in the lamp base or bottom, which when the proper connection is made with the full-line working potential of an electric railway completes the positive lamp-circuit, the dash of the car, being grounded, forming, through the wire k, the complete circuit from the lamp to the ground.

M designates a positive terminal plug designed to fit within the spring-socket L. It is connected to a flexible wire x', which leads from a terminal block m, which latter is connected to the trolley-circuit through a resistance (not shown) by a positive wire x^2. At any suitable point is located, preferably beneath the car-platform, a socket m', in which the plug M is positioned when the lamp is not in use. This socket is so located relatively to the terminal block m that the wire x' will not sag to too great an extent when the plug is inserted in said socket.

From what has been said the operation of a lamp constructed in accordance with my improvements will be apparent. After the plug M is inserted in the spring-socket L the motorman presses downward on shaft h', forcing the positive carbon into contact with the negative carbon, and, immediately removing

such pressure, allowing the parts to resume their elevated position under the tensions of springs $g^{\times}$ and I, the formation of the arc is completed. To feed the carbons together when burned too far apart, the motorman simply rotates the shaft h' in a clockwise direction. If the carbons should be too close together, the shaft h' is turned in the opposite direction. To effect the adjustment of the negative carbon independently of the positive carbon, the shaft h' is again depressed, and while so held is rotated. In this way the arc may always be maintained in the line of focus or focal center of the reflector. Hence it will be seen that the adjustment of both the positive and negative carbons is effected by rotating the translucent arc-inclosure, to whichthe feeding or adjusting mechanism of both the carbons are directly connected. It is evident that the only strain or tension on the arc-inclosure is in the adjustment of the negative carbon.

Without departing from the spirit of my invention changes may be made in the construction and arrangement of the parts herein described.

I claim as my invention—

1. An electric headlight-lamp having positive and negative carbons, an inclosure for said carbons, means to which said inclosure is secured for adjusting said carbons, and means for axially rotating said inclosure, whereby said carbons may be relatively adjusted.

2. An electric headlight-lamp having positive and negative carbons, an inclosure for said carbons, means to which said inclosure is secured for adjusting said carbons, and means for axially rotating said inclosure comprising a rotary member projecting outside of the lamp.

3. An electric headlight-lamp having positive and negative carbons, rotary feeding mechanisms therefor in axial line with each other, an inclosure for said carbons connected at its ends to said mechanisms, and means for axially rotating said inclosure and mechanisms; whereby said carbons may be simultaneously adjusted.

4. An electric headlight-lamp having positive and negative carbons, rotary feeding mechanisms therefor in axial line with each other, an inclosure for said carbons secured at its ends to said mechanisms, means for detachably connecting one of said carbons to its feeding mechanism, and means for axially rotating said inclosure and mechanisms, substantially as set forth.

5. An electric headlight-lamp comprising an inclosure, carbon-carrying rods and sleeves therefor having their axial centers in line with that of said inclosure, adjusting mechanisms for said sleeves to which said inclosure is secured, means for disengaging one of said sleeves from its adjusting mechanism, and means for axially rotating said inclosure, substantially as set forth.

6. An electric headlight-lamp having positive and negative carbon rods, adjusting-sleeves for said rods, an inclosure to one end of which one of said sleeves is positively secured, the other sleeve being detachably connected to the other end of said inclosure, a spring for normally maintaining such connection, and means for rotating said inclosure and disconnecting said detachable sleeve therefrom, substantially as set forth.

7. In an electric headlight-lamp, the combination with the frames having angular openings therein, of the carbon-rods having angular portions corresponding to said openings and also having threaded enlargements, adjusting-sleeves for said rods having internal threads, an inclosure connecting both of said sleeves, and means for axially rotating said inclosure, substantially as set forth.

8. In an electric headlight-lamp, the combination with the frames having angular openings therein, of the carbon-rods having angular portions corresponding to said openings and also having threaded enlargements, adjusting-sleeves for said rods having internal threads, casings carrying said sleeves, one of said casings having a series of gear-teeth, an inclosure connecting said casings, and an operating-shaft having a pinion meshing with said teeth, substantially as set forth.

9. In an electric headlight-lamp, the combination with the frames having angular openings therein, of the carbon-rods having angular portions corresponding to said openings and also having threaded enlargements, adjusting-sleeves for said rods having internal threads, a casing to which one of said sleeves is fixedly secured, a second casing having a series of gear-teeth and a series of serrations with which the other one of said sleeves engages, a spring normally maintaining such engagement, a shaft having a pinion meshing with said gear-teeth, and an inclosure connected to both of said casings, substantially as set forth.

10. The combination with the upper and lower frames, and the carbon-rods fitted therein having external threads, sleeves for said rods having inner threads, and a lower casing carrying one of said sleeves, the other one of said sleeves having a flange formed with serrations, of an upper casing having a series of gear-teeth and a series of serrations with which said former serrations engage, a spring for maintaining such engagement, an operating-shaft having a pinion meshing with said gear-teeth, and an inclosure connecting said casings, substantially as set forth.

11. The combination with the upper and lower frames, and the carbon-rods fitted therein having external threads, sleeves for said rods having inner threads, and a lower casing carrying one of said sleeves, of an upper casing to which the other one of said sleeves is detachably connected, a spring for maintaining such engagement, a circular series of gear-teeth carried by said upper cas-

ing, a spring-held shaft having a pinion meshing with said gear-teeth, and a device operated by said shaft connected to said upper sleeve for effecting the disengagement thereof from said upper casing, substantially as set forth.

12. The combination with the upper and lower frames, and the carbon-rods fitted therein having external threads, sleeves for said rods having inner threads, and a lower casing carrying one of said sleeves, of an upper casing to which the other one of said sleeves is detachably connected, a spring for maintaining such engagement, a circular series of gear-teeth carried by said upper casing, a spring-held shaft having a pinion meshing with said gear-teeth, a collar on said shaft, and a second collar on said upper sleeve, levers connected to the former collar, and bars connecting said levers to the second-mentioned collar, substantially as set forth.

13. The combination with the carbon-rods having threaded portions, and frames for said rods, of the adjusting-sleeves for said rods having internal threads, casings for said sleeves, a spring for detachably holding one of said sleeves to its casing, means for depressing said sleeve independently of its casing, and an inclosure connecting said casings, substantially as set forth.

14. The combination with the carbon-rods having threaded portions, and frames for said rods, of the adjusting-sleeves for said rods having internal threads, casings for said sleeves, a spring for detachably holding one of said sleeves to its casing, means for depressing said sleeve independently of its casing, an inclosure connecting said casings, and means for axially rotating said inclosure, substantially as set forth.

15. An electric headlight-lamp having a pivoted frame attached to its rear wall, said frame having rearward projections, and means for adjusting said frame, as and for the purpose set forth.

16. An electric headlight-lamp having its casing formed with openings, a frame pivoted to said casing having angular projections extended outward through said openings, buffers on said projections, and an adjusting-screw engaging said frame, substantially as set forth.

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

HARLAN P. WELLMAN.

Witnesses:
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R. L. RICHARDSON.