No. 662,727. Patented Nov. 27, 1900.

E. B. JONES.

ATTACHMENT FOR ARC LAMPS.

(Application filed May 26, 1900.)

(No Model.)

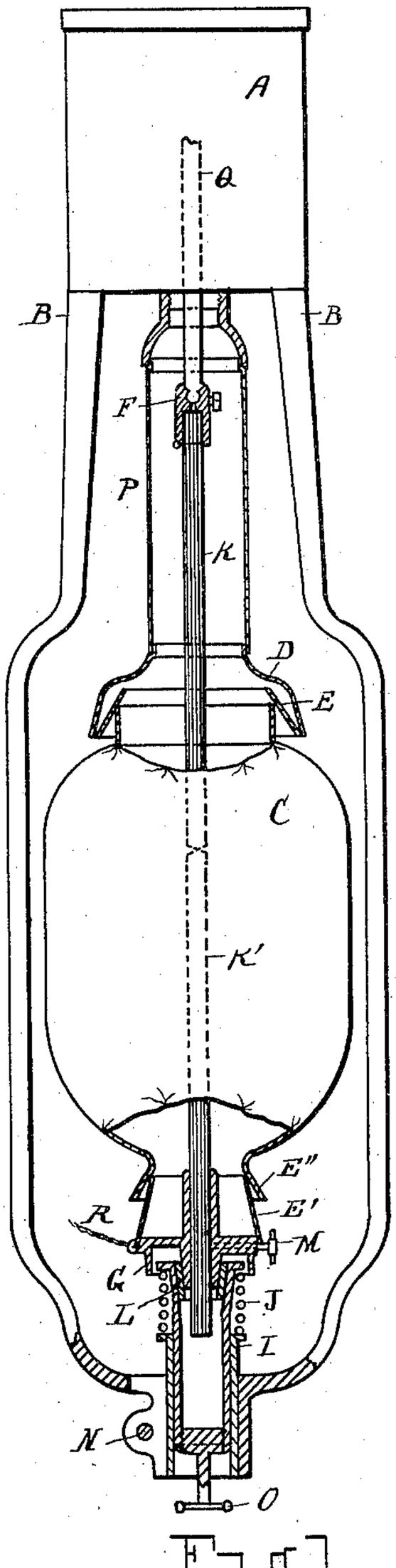

Fig. 1.

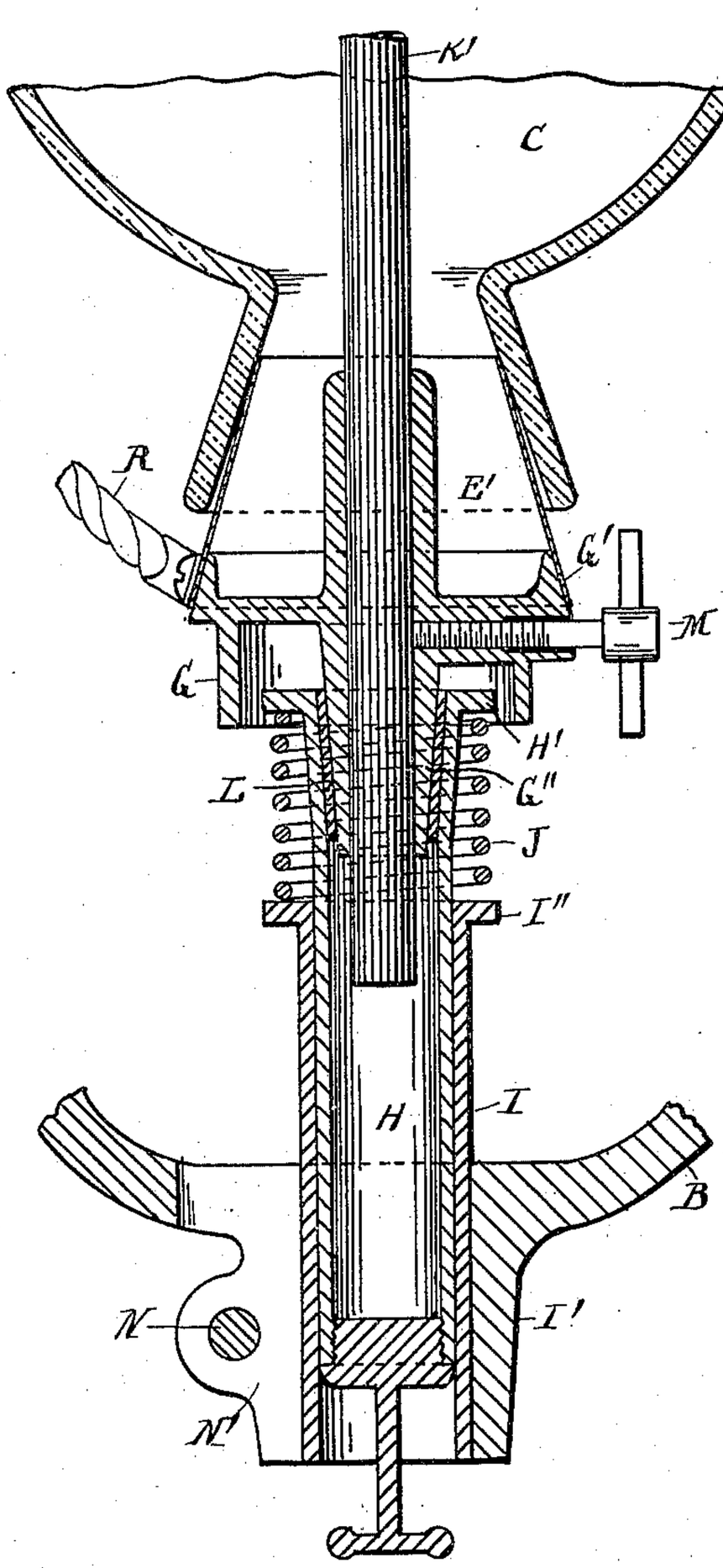

Fig. 2.

WITNESSES.

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ATTACHMENT FOR ARC-LAMPS.

SPECIFICATION forming part of Letters Patent No. 662,727, dated November 27, 1900.

Application filed May 26, 1900. Serial No. 18,176. (No model.)

To all whom it may concern:

Be it known that I, EDWIN B. JONES, mechanical engineer, of the city of Chatham, in the county of Kent, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Attachments for Arc-Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to new and useful improvements in arc-lamps; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide an attachment for any of the ordinary open-arc lamps in which the arrangement is such that the life of the ordinary carbon may be greatly prolonged; to provide flexible metallic air-tight joints at the openings of the glass globe; to provide for compensating for any deviation from a true circle in the openings of the glass globe, so that such deviation will not prevent the making of a tight joint; to obviate the necessity of ground joints on the glass globes requiring only the ordinary blown globes; to provide compensating means to allow for expansion and contraction and maintain at all times a tight joint between the globe and the coupling parts; to provide for the easy removal of the lower-carbon holder; to obviate the use of special and expensive carbons, and to provide for the easy attachment and detachment of the several parts.

The above objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section through a lamp embodying my invention. Fig. 2 is an enlarged vertical section through the lower part of the globe, the lower-carbon holder, and the telescopic spring-actuated tubes, whereby said holder and lower coupling are yieldingly maintained in position.

Referring to the characters of reference, A designates the housing or body of the lamp, containing the mechanism for operating the carbon-rod Q, which mechanism may be of any well-known construction.

B designates the frame for sustaining the globe C and the other parts of the lamp. Said globe is open at both ends and is supported between yielding couplings, of which the flexible thimbles E and E′ form a part, whereby air-tight joints are effected between said coupling parts and the opposed ends of the globe. The upper thimble E is made of thin flexible metal, preferably copper spun to the form of a slightly-tapering thimble, and of such diameter as to snugly receive the circular wall of the globe surrounding the opening at the upper end thereof, the lower edge of said thimble being securely fastened to the lip of the embracing canopy or holder D, which depends from the lower end of the cylindrical casing P, forming a chamber for the upper carbon K and the carbon-rod Q and supported by the lamp body or housing A. The lower thimble E is also formed of thin flexible metal and is slightly tapering in shape, being of such diameter at its upper end as to snugly enter the lower flaring opening E″ of the globe. The thinness of the metal of which said thimble is formed is such as to render it slightly compressible to enable it to conform to any irregularities in the globe-opening and effect at all times a tight joint between the globe and thimble.

The lower-carbon holder G is provided with an annular tapering base G′, adapted to receive and support the lower end of the thimble E′, which slips over the tapering portion of said base and is sufficiently free thereon to allow of a movement of the lower end of the thimble to permit the upper end to conform to the irregularities of the globe-opening and at the same time maintain a tight closure between said base and globe. Passing through the base of the carbon-holder is a set-screw M, which is adapted to engage and hold the carbon-point K′ therein. From the base of the carbon-holder there depends a tubular conical portion G″, through which said carbon is adapted to pass and which extends into the upper flaring end of the tube H, said tube being insulated from the tubular portion of the carbon-holder by means of the interposed bushing of suitable insulating material L. The upper end of the tube H is provided with an annular laterally-projecting flange H′, and the lower end of said tube slides within an outer vertically-movable tube I, which is seated in a split socket I′ at the

lower end of the frame, said socket being made collapsible by means of a screw N passing through the divided ears N′ thereof, whereby the base of said frame may be clamped upon the tube I to hold it at any desired point of adjustment. The top of the tube I is also provided with an annular laterally-projecting flange I″, between which and the flange at the upper end of the tube H is interposed a coiled spring J, the force of which is normally exerted to distend said tubes. It will be seen that by moving the outer tube I upward against said spring until sufficient tension has been placed thereon and then clamping said tube in place by the screw N an upward force will be continuously exerted by said spring upon the lower-carbon holder to maintain the coupling-thimbles E and E′ forcibly, but yieldingly, in contact with the margins of the openings in the respective ends of the globe, thereby insuring the maintenance of a joint which is practically air-tight between said thimbles and globe, and at the same time allowing for expansion and contraction between said parts due to changing temperature and other causes. Screwed into the lower end of the tube H is a removable plug O, adapted to tightly close the lower end of said tube.

The current-conductor R is connected electrically with the lower-carbon holder G. The upper carbon K is secured by a clamp-holder F, attached to the lower end of the carbon-rod Q. When the current is turned onto the lamp, the carbons are separated and the arc is formed between their adjacent points, as is well understood. In a short time after the lighting of the lamp the oxygen is exhausted from the air contained in the chamber P and the globe C, and the rapid consumption of the carbons is arrested because of insufficient oxygen to maintain combustion. The slight consumption of the carbons which takes place after the exhaustion of the oxygen is due to the disintegration of the carbons resulting from the heat of the arc and the flow of the electric fluid. This consumption, however, is slight compared with that in an open-arc lamp, the same carbons in this improved lamp lasting three or four times as long as under ordinary conditions.

When the lamp is required to be trimmed, the lower plug O is first removed and the screw M, which holds the lower carbon, is unscrewed, when the remaining portion of the lower carbon is removed by allowing it to drop through the tube H. The screw M, that clamps the socket of the frame upon the tube I, is then loosened and said tube lowered until its flange I″ rests upon the frame, thereby releasing the globe C from contact with the upper thimble E. The carbon-rod Q is then pushed up to a level with the hood or canopy D, when the glass globe can be readily removed for recleaning or recarboning by tipping it outward between the bars of the frame.

In recarboning the lamp the top end of the upper carbon is placed in the carbon-clamp F. The carbon and carbon-rod Q are then lowered until the lower end of the carbon enters the lower-carbon holder G for the purpose of alinement. The upper clamp F is then made fast to securely hold the carbon in place. The upper carbon and rod Q are then raised to their highest position and are held by a device in the body of the lamp. (Not shown.) The glass globe is then replaced and the tube I is raised, so as to compress the spring J and cause it to exert sufficient power to force and hold the coupling-thimbles E and E′, respectively, in contact with the margins of the openings at the opposite ends of the globe and effect an air-tight joint between said connected parts. The lower carbon K′ is then introduced through the lower end of the tube H and pushed up to such height as to come in contact with the upper carbon and raise it slightly, which movement releases the carbon-rod, leaving it free to descend. The set-screw M is then screwed against the lower carbon, securing it in place, and the screw-plug O is returned to the lower end of the tube H, when the lamp is ready for service.

I have described the coupling-thimbles E and E′ as conical or tapering, such being the preferred form. I do not wish to limit myself, however, to said specific formation, as it is evident that straight thimbles or thimbles having parallel walls may be used without departing from the spirit of my invention.

It will be observed that the chamber P is of large area, as well as the globe C, the purpose of which is to afford increased radiating-surface, and thereby reduce the temperature within the globe, preventing in a large measure the circulation of the contained gases and a consequent consumption of the carbons. The cooler condition of the globe also prevents the particles of carbon from adhering to the glass and obstructing the rays of light.

I am aware that arc-lamps have been produced provided with air-tight globes, and I do not therefore claim such feature broadly.

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

1. In an arc-lamp, the combination of a suitable frame, a globe supported in said frame, having a flaring opening at the bottom thereof, a lower-carbon holder, supported in the frame adjacent to the lower end of said globe, and a flexible metallic thimble seated upon said holder, and extending into engagement with the wall of the globe-opening and effecting air-tight joints at its respective terminals between said globe and holder.

2. In an arc-lamp, the combination of a suitable frame, a glass globe supported in said frame and open at its opposite ends; a hood suspended over the opening at the upper end of the globe carrying a flexible thimble which engages the wall of the globe-opening, a second flexible thimble engaging the wall of the opening at the bottom of the globe, a movable sup-

port for said lower thimble and means for exerting an upward pressure upon said support to hold said upper and lower thimbles yieldingly in contact with the extremities of the globe.

3. In an arc-lamp, the combination with a suitable frame, a glass globe in said frame open at its opposite ends, flexible metallic thimbles supporting said globe at its opposite ends and effecting an air-tight closure of said openings and means for maintaining said thimbles yieldingly in contact with the globe.

4. In an arc-lamp, the combination with a suitable frame, a glass globe mounted on said frame and having a flaring opening at the lower end thereof, a carbon-holder adjacent to said opening, a flexible movable metallic thimble, mounted upon said carbon-holder, and extending into contact with the flaring opening of the globe, a flanged tube adjustably mounted in the frame, a second flanged tube adapted to slide within said first-mentioned tube and supporting said holder and a compressible spring interposed between the flanges of said tubes, whereby an upward pressure is exerted upon the holder to force said thimble into contact with the globe.

Chatham, Canada, May 14, 1900.

EDWIN B. JONES.

In presence of—

W. G. MERRITT,

JAS. C. WEIR.