(No Model.)

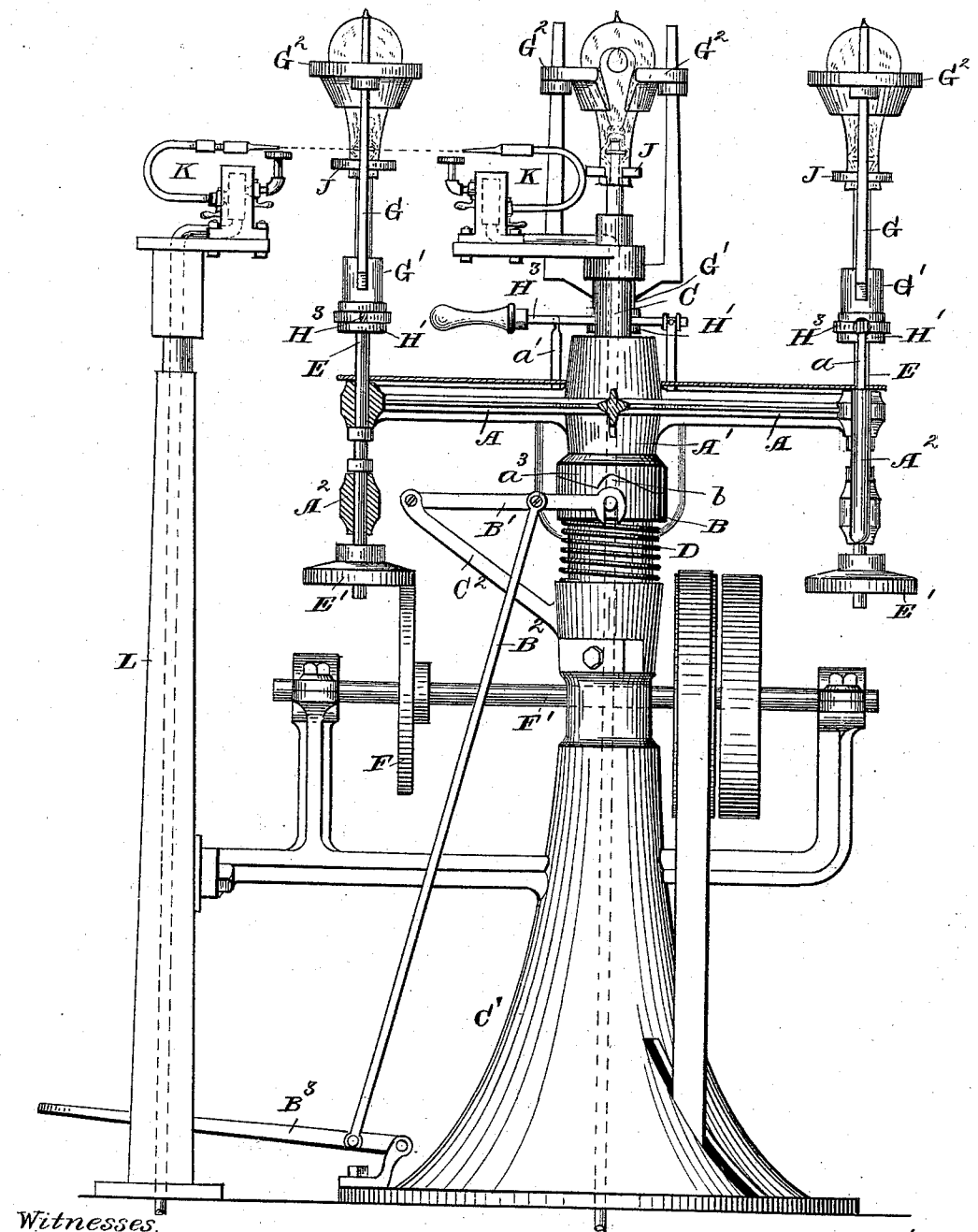
3 Sheets—Sheet 1.

A. J. SPILLER & J. R. MASSEY.

MACHINE FOR SECURING FILAMENT HOLDERS INTO GLOBES OF INCANDESCENT LAMPS.

No. 537,493. Patented Apr. 16, 1895.

-FIG. I-



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(No Model.) 3 Sheets—Sheet 2.

A. J. SPILLER & J. R. MASSEY.

MACHINE FOR SECURING FILAMENT HOLDERS INTO GLOBES OF INCANDESCENT LAMPS.

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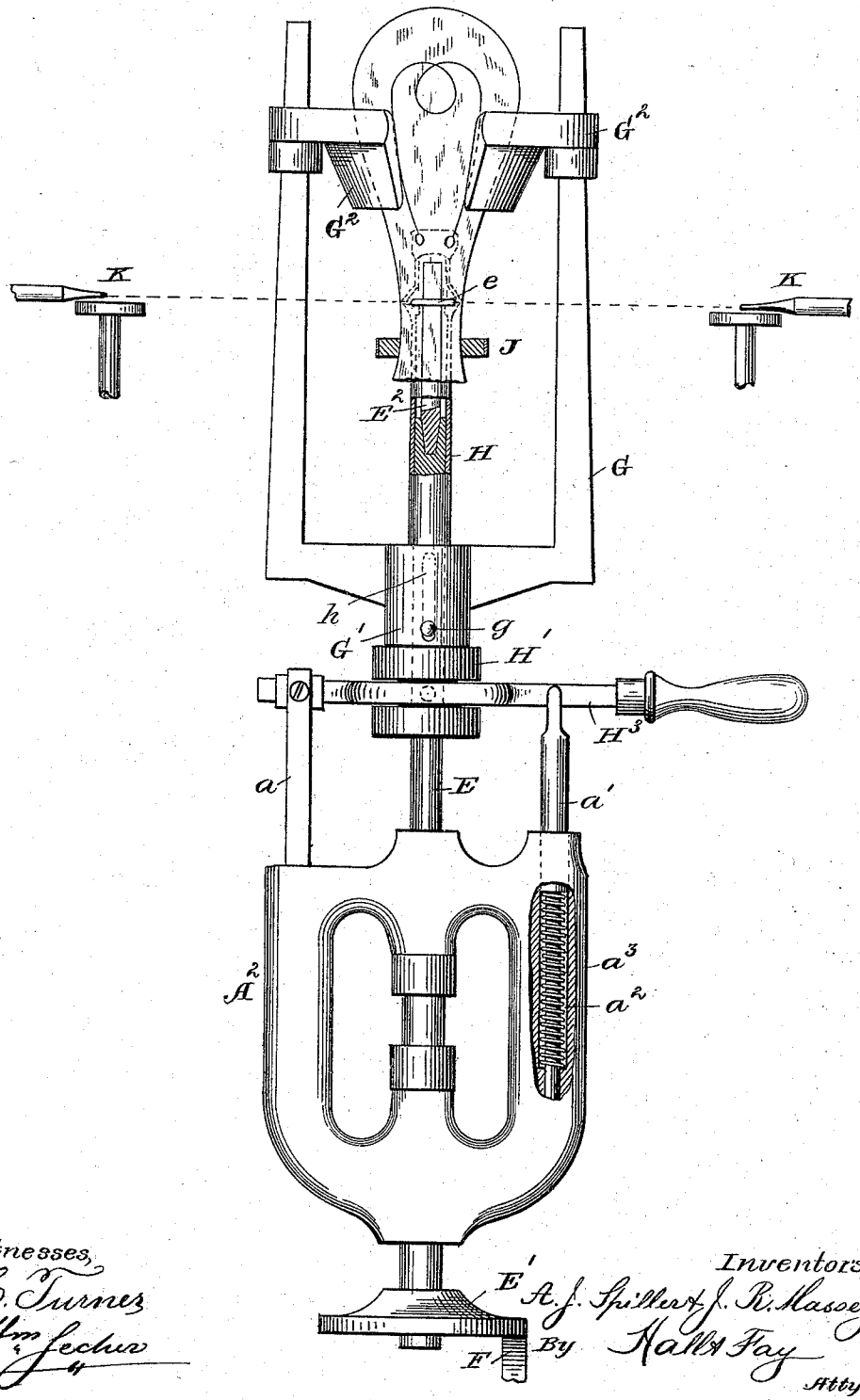
-FIG. II-



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(No Model.)

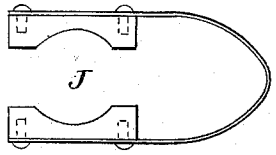
3 Sheets—Sheet 3.

A. J. SPILLER & J. R. MASSEY.

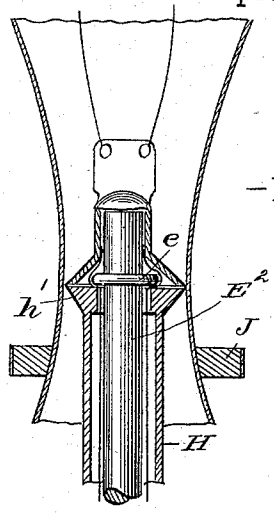
MACHINE FOR SECURING FILAMENT HOLDERS INTO GLOBES OF INCANDESCENT LAMPS.

No. 537,493. Patented Apr. 16, 1895.

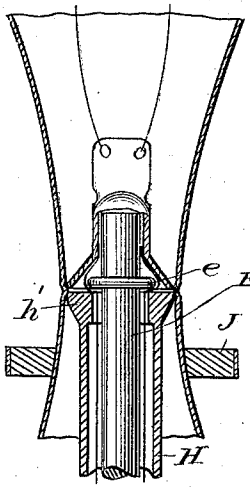
-FIG. VII-



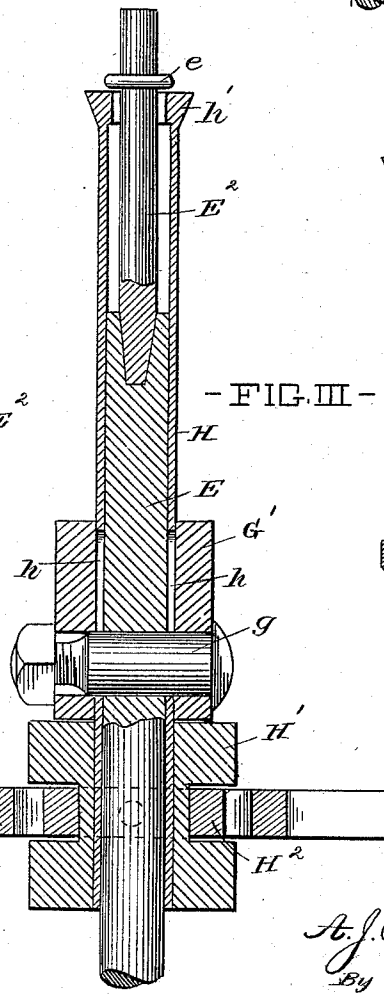
-FIG. IV-



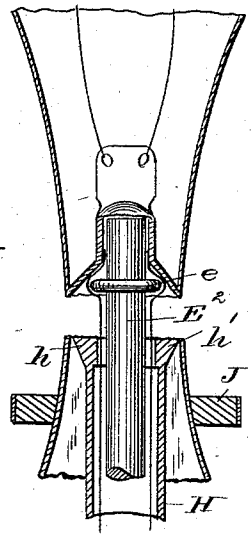
-FIG. V-



-FIG. III-



-FIG. VI-



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UNITED STATES PATENT OFFICE.

ARNOLD J. SPILLER AND JOHN R. MASSEY, OF CLEVELAND, OHIO, ASSIGNORS TO THE BUCKEYE ELECTRIC COMPANY, OF SAME PLACE.

MACHINE FOR SECURING FILAMENT-HOLDERS INTO GLOBES OF INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 537,493, dated April 16, 1895.

Application filed May 17, 1894. Serial No. 511,626. (No model.)

To all whom it may concern:

Be it known that we, ARNOLD J. SPILLER, a subject of the Queen of Great Britain, and JOHN R. MASSEY, a citizen of the United States, residents of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Machines for Securing Filament-Holders into the Globes of Incandescent Lamps, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail, one mechanical form embodying the invention; such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings—Figure I represents an elevation of our improved machine for securing the filament holders into the globes of incandescent lamps; Fig. II, an enlarged elevation of one of the devices for holding the globe and filament holder during the time of affixing the latter to the former; Fig. III, a vertical sectional detail view of the shaft and sleeve upon which the filament holder and the globe are held, and of the means for sliding the sleeve upon the shaft; Figs. IV, V, and VI, sectional views, respectively illustrating the relative positions of the filament holder and the globe, before the heat is applied to the same, while the heat is applied, and after the filament holder has been secured into the neck of the globe and the waste portion of the globe has been pulled off from the portion of the globe which remains, and Fig. VII, a plan view of the weight for removing the waste portion of the neck of the globe.

A series of radiating arms, A, project from a hub, A′, the lower end of which has clutch teeth, a^3, which engage with corresponding clutch teeth, *b*, upon a sleeve, B, which slides upon a hollow standard, C, having a suitable base, C′. A spring, D, serves to force the clutch sleeve B upward, and a lever, B′, is pivotally connected to said sleeve, and has its fulcrum upon a bracket, C^2, which projects from the base C′, of the standard. A connecting rod, B^2, is pivoted to the lever B′, and is pivoted to a treadle, B^3, by means of which the clutch sleeve may be depressed against the spring.

The number of teeth upon the hub and the clutch sleeve corresponds to the number of arms A, so that each arm may stop at the proper place after the clutch sleeve has been depressed, the arms revolved, and the clutch sleeve again released. Each arm has a vertical frame, A^2, in which a shaft, E is journaled. Said shaft has a friction disk, E′, at its lower end, which may engage,—when brought to register with the same,—with a friction disk, F, upon a horizontal shaft, F′, which receives its motion from any suitable motive power.

A forked frame, G, has a collar, G′, within which a sleeve, H, which fits upon the vertical shaft E, may vertically slide. The collar of the forked frame and the shaft E are connected by means of a key, *g*, and the sleeve H has longitudinal slots, *h*, through which the key passes, and which permits the sleeve to slide upon the shaft and within the collar, while the shaft, sleeve and forked frame may rotate together.

A circumferentially grooved collar, H′, is secured upon the lower end of the sleeve H, and a ring, H^2, fits into the groove of said collar and is pivotally connected to a hand lever, H^3, which is fulcrumed upon a bracket, *a*, projecting from the frame upon the outer end of the arm A. The free arm of the hand lever bears against a bolt, *a*′, which slides in a vertical bore, a^2, in the frame upon the outer end of the arm A, and has a spring, a^3, surrounding it and bearing against a shoulder upon the bolt and against a shoulder in the bore, so that said spring may raise the free end of the lever after the latter has been depressed.

The upper end of the sleeve H is flared, to form a flange, *h*′, upon which the flaring end of the filament holder may rest, and against the sharp cutting edge of which the contracted neck of the globe may bear. A spindle, E^2, is removably secured in the upper end of the shaft E, and projects beyond the end of the sleeve H, having a collar, *e*, against which the flaring end of the filament holder may rest,

while the upper end of the spindle may fit into the tubular portion of the filament holder. Sufficient space is left between the spindle and the sleeve to admit of the leading-in wires of the filament to be inserted between the sleeve and spindle.

A funnel-shaped globe-support, G^2, is adjustably secured upon the arms of the forked frame G, and the globe may be supported in said funnel, with its neck resting against the flaring flange of the vertically movable sleeve. A suitable weight, J, preferably in the shape of a spring clamp, is fitted upon the waste portion of the neck of the globe, so as to pull said portion downward, when the glass has been sufficiently heated and softened at the joint between the flaring end of the filament holder and the globe, and said joint has been welded, the sleeve being then depressed so as to allow the weight to draw the waste portion of the neck downward.

Suitable blow pipes, K, are supported at opposite points, in such manner that the point at which the welding of the globe and filament holder is to be accomplished, may be exactly at the meeting point of the jets issuing from the blow pipes. In the drawings, one blow pipe is illustrated as supported from the hollow standard C, and the other blow pipe is illustrated as supported upon a standard, L, and the meeting point of the jets from said blow pipes is so gaged, that the welding point of each globe upon each of the radiating arms A, which form the turn table of the machine, may be successively brought to register with the meeting point of the jets of the blow pipes.

In practice, the filament holder is placed upon the upper end of the spindle, the globe is placed over the filament holder, with its contracted neck bearing against the flange of the vertically sliding sleeve, the weight is clamped in position upon the lower end of the neck, and the turn table is rotated and stopped by means of the clutch, with the welding point of the filament holder and globe in the meeting point of the jets of the blow pipes; while the friction disk upon the lower end of the shaft, at the same time, engages the friction disk upon the power shaft. The shaft, globe-supporting frame, and sleeve will thus be revolved,—exposing all sides of the neck of the globe to the jets of the blow-pipes, exactly at the point where the welding of the filament holder and globe is to take place. The relative positions of the filament holder, globe, filament holder support, and support for the neck of the globe, are illustrated in Fig. IV. As the jets of the blow pipes exert their influence upon the neck of the revolving globe, the walls of the neck will soften and adhere to the edge of the flaring end of the filament support, as illustrated in Fig. V. When the glass at the welding point has been sufficiently softened, the hand lever H^3 is depressed, and the weight and the neck support will tear off the waste portion of the neck of the globe. The welding point of the globe and filament holder may be yet exposed to the action of the blow pipe jets for a short space of time, so as to thoroughly weld the joint between the parts, and so as to even the edges at the joint. While one globe is being acted upon by the blow pipe jets, other globes may be placed in position upon the supports at other points of the turn table, and the finished globes may be removed from their supports, and the waste portions of the necks may be broken off.

The neck support h', is preferably of copper or other material which will not adhere to glass when exposed to heat, sufficient to soften glass, and the sharp edge of the support will materially assist in severing the surplus neck portion from the globe, when the glass is softened at a circumferential line registering with the edge, as the glass cannot adhere to the edge and the surplus portion will, consequently, fall away by its gravity, aided by the weight and by the downward motion imparted to the neck support.

Other modes of applying the principle of our invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth respectively in the following claims are employed.

We therefore particularly point out and distinctly claim as our invention—

1. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a turn table, revoluble supports for the filament holder and globe arranged at points at equal distances from the center of said turn table and each having a gear, and a continuously revolving gear arranged at a point registering with the heat applying means and adapted to successively engage the gears upon the supports as the turn table is rotated to bring the supports within the action of the heat applying means, so as to rotate each support when it is within such action, substantially as set forth.

2. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a filament holder support, a globe support, a support for the neck of the globe, means for rotating said filament holder support, globe support, and neck support, and means for withdrawing the neck support from the filament holder support so as to sever the surplus portion of the neck from the globe and filament holder, substantially as set forth.

3. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a turn table, revoluble supports for the filament holder, globe, and neck of the globe, arranged at points at equal distances from the center of said turn table, means for revolving each of said supports,

and means for withdrawing the neck support from the filament holder support, so as to sever the surplus portion from the neck of the globe and filament holder, substantially as set forth.

4. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of a stationarily located revolving gear, a turn table having filament holder supports, globe supports, and neck supports, arranged at points at equal distances from the center of the turn table and each provided with a friction gear which revolves all of said parts and may engage the stationarily located gear, means for applying heat at the point of juncture between the filament holder and the globe, and means for withdrawing the neck support from the filament holder support and globe support, substantially as set forth.

5. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point,—as one element,—a filament holder support and neck support for the globe,—as another element,—means for rotating one of said elements in its relation to the other, and means for withdrawing the neck support from the filament holder support, so as to sever the surplus portion of the neck from the globe and filament holder, substantially as set forth.

6. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of a filament holder support, a neck support adapted to fit within the neck of the globe, means for applying heat at the junction between the filament holder and the neck of the globe, and means for moving one of the supports away from the other to remove the surplus glass of the neck and for again returning said supports to their normal relative positions, substantially as set forth.

7. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a filament holder support, a globe support, a support for the neck of the globe, means for rotating said filament holder support, globe support, and neck support, a weight for the waste portion of the neck of the globe, and means for withdrawing the neck support from the filament holder support, substantially as set forth.

8. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a shaft having means for revolving it and provided with a filament holder support at its upper end, a globe support connected to revolve with said shaft, a neck support for the globe arranged to revolve with the shaft and to longitudinally slide upon the same, and means for longitudinally sliding said neck support, substantially as set forth.

9. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for applying heat at a given point, a turn table, shafts journaled at points at even distances from the center of said turn table and having gears at their lower ends, a gear adapted to engage the gears and arranged at a point corresponding to the heat applying means, globe supports arranged to revolve with said shafts, filament holder supports upon said shafts, and neck supports arranged to rotate with and to slide upon said shafts and having means for longitudinally sliding them upon said shafts, substantially as set forth.

10. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of a turn table, a blow pipe arranged to project its jet radially to said turn table, a blow pipe jet opposed to said last mentioned jet, a friction gear arranged to register with said jets, shafts journaled in said turn table and having friction gears adapted to successively engage said last mentioned friction gear, filament holder supports at the ends of said shafts, globe supports arranged to revolve with said shafts, neck supports arranged to revolve with said shafts and to longitudinally slide upon the same, and means for longitudinally moving said neck supports, substantially as set forth.

11. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of a filament holder support, a neck support for the globe, means for moving one of said supports from and toward the other, a weight for the surplus neck of the globe, and means for applying heat at the juncture between the filament holder and globe, substantially as set forth.

12. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for supporting the globe and filament holder, and means for applying heat at the juncture between the globe and filament holder, with a neck support adapted to fit into the neck of the globe at the juncture between the latter and the filament holder and constructed of a material which has the inherent quality of not permitting heated glass to adhere to it, substantially as set forth.

13. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for supporting the globe and filament holder, and means for applying heat at the juncture between the globe and filament holder, with a neck support of material which will not adhere to heated glass and arranged to fit within the neck at said juncture, and means for moving said globe and filament holder support and the neck support,—one in its relation to the other,—toward and from each other, substantially as set forth.

14. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for supporting the globe and filament holder, and means for applying heat at the juncture between the globe

and filament holder, of a cutting edge of a material which will not adhere to heated glass and arranged at the point of juncture between the neck of the globe and the filament holder, substantially as set forth.

15. In a machine for securing the filament holders into the globes of incandescent lamps, the combination of means for supporting the globe and filament holder, and means for applying heat at the juncture between the globe and filament holder, of a cutting edge of a material which will not adhere to heated glass and arranged at the point of juncture between the neck of the globe and the filament holder, and means for removing the surplus portion of the neck of the globe from the globe and filament holder, substantially as set forth.

In testimony that we claim the foregoing to be our invention we have hereunto set our hands this 10th day of May, A. D. 1894.

ARNOLD J. SPILLER.
JOHN R. MASSEY.

Witnesses:
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DAVID T. DAVIES.