

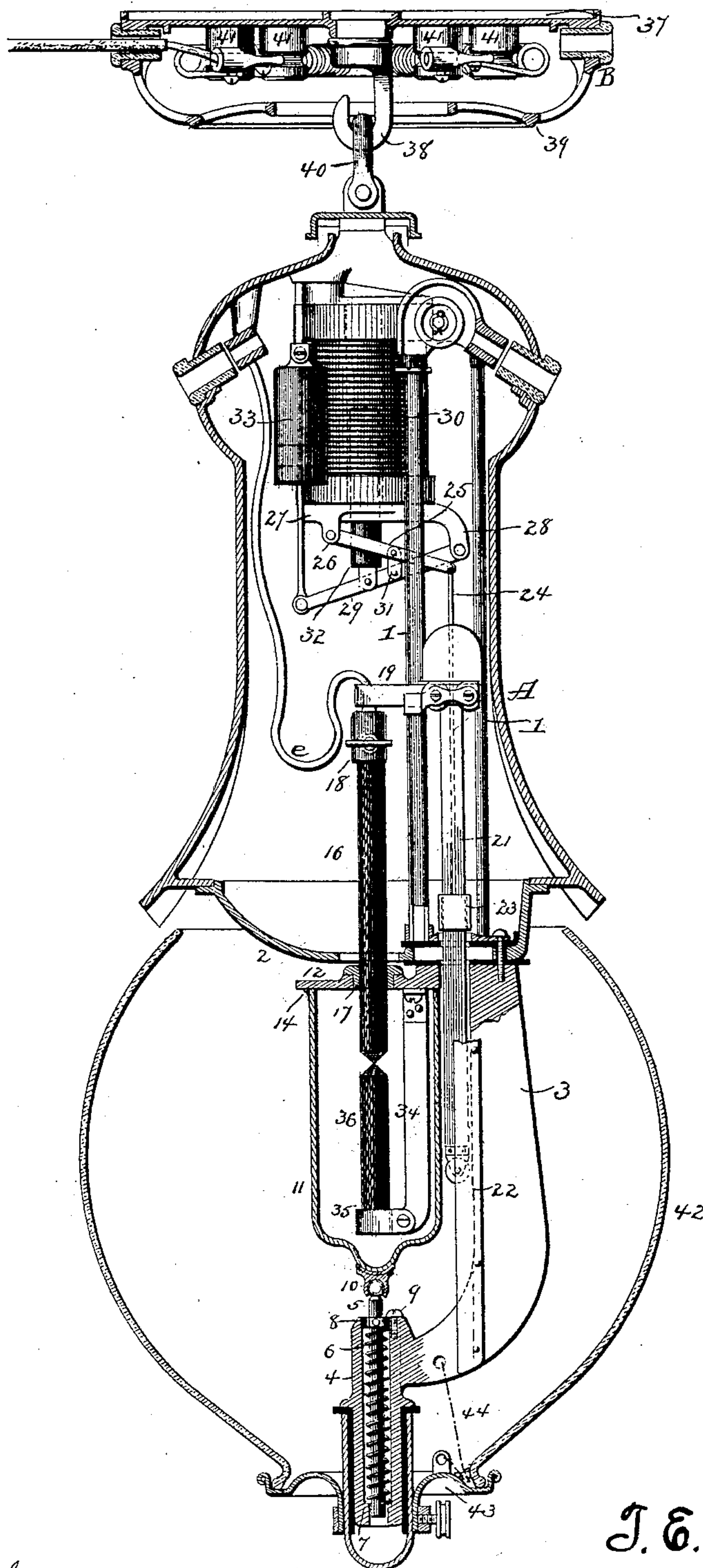
(No Model.)

2 Sheets—Sheet 1.

T. E. ADAMS.
ELECTRIC ARC LAMP.

No. 560,671.

Patented May 26, 1896.



Witnesses
E. J. Nottingham
G. F. Downing

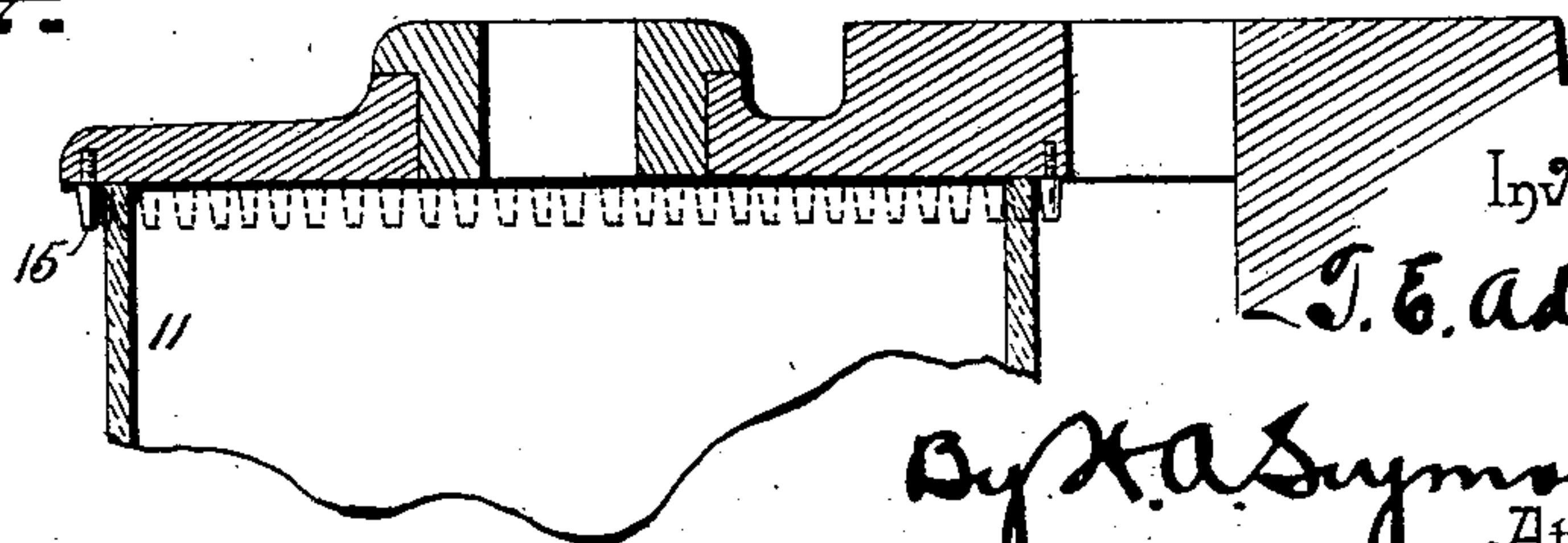
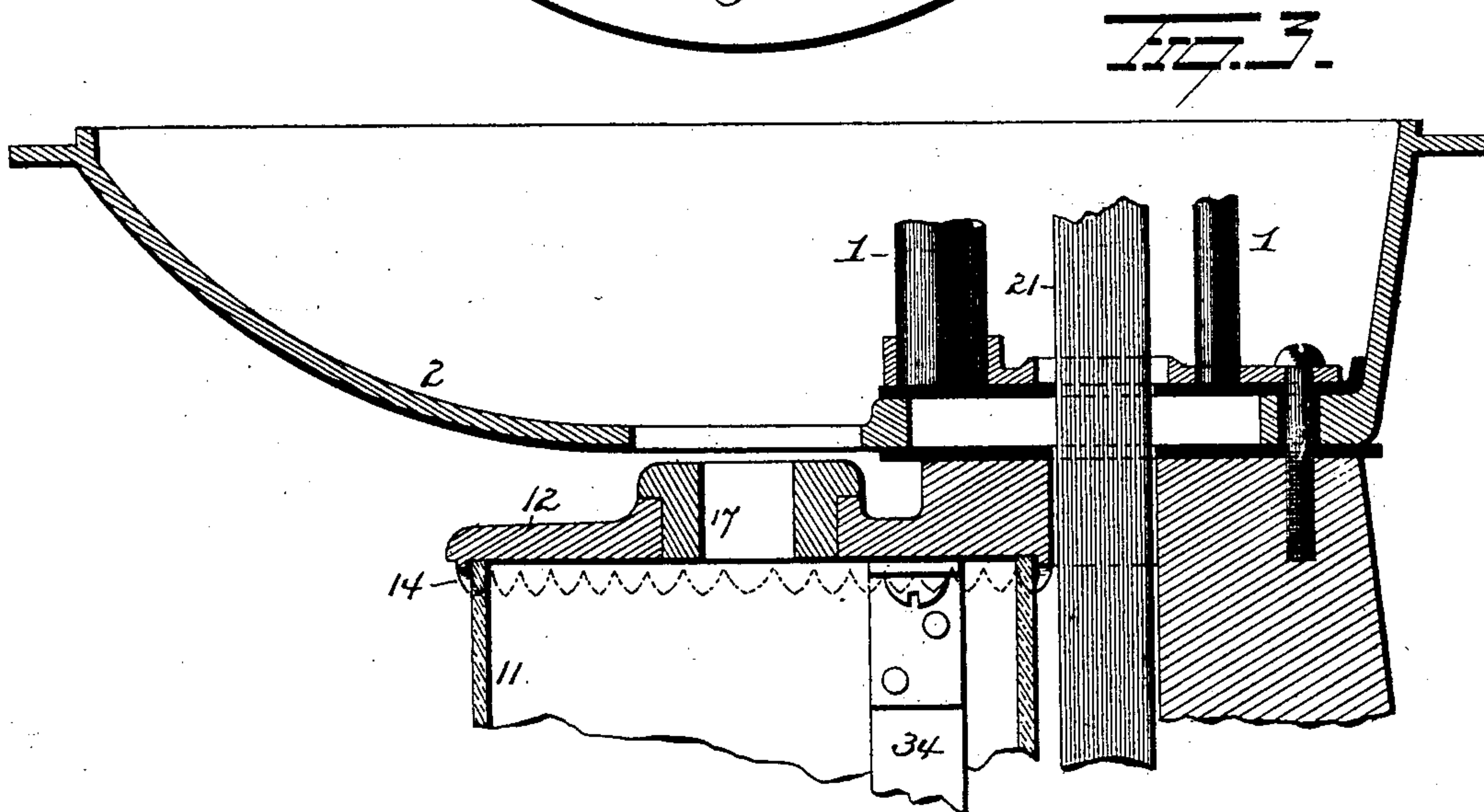
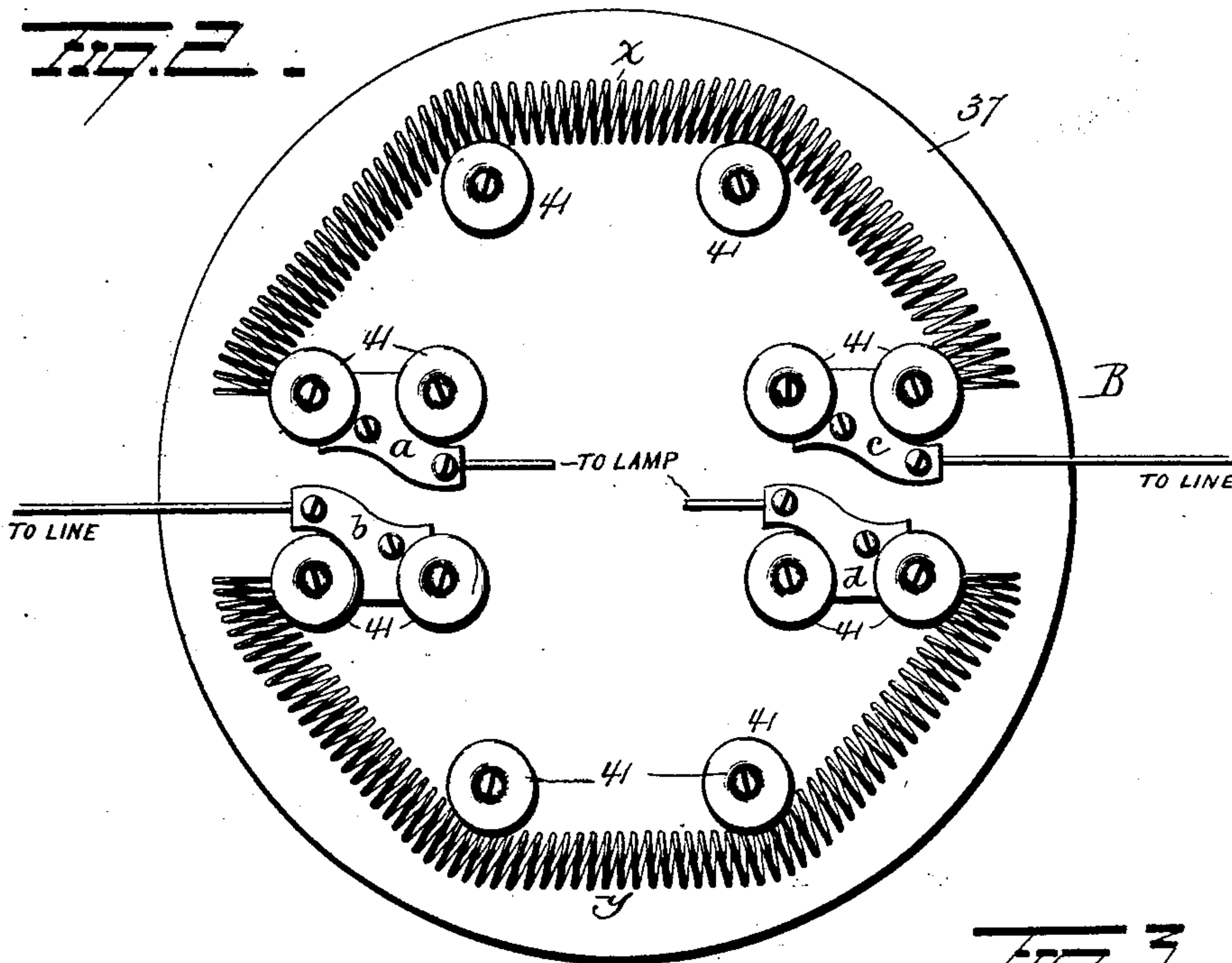
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By *H. A. Seymour*
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UNITED STATES PATENT OFFICE.

THOMAS EDGAR ADAMS, OF CLEVELAND, OHIO, ASSIGNOR TO THE ADAMS-BAGNALL ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 560,671, dated May 26, 1896.

Application filed January 4, 1896. Serial No. 574,374. (No model.)

To all whom it may concern:

Be it known that I, THOMAS EDGAR ADAMS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and
5 useful Improvements in Electric-Arc 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
10 the same.

My invention relates to an improvement in electric-arc lamps, and more particularly to that class in which the arc is inclosed by a closed inner globe. In lamps of this class it
15 is important that the arc-inclosing globe be air-tight below and for some distance above the arc. The products of the arc which settle in the globe and expel the air must rise above the arc to insure duration of the carbon points. This is best attained by a globe
20 having no openings through its glass except at a point above the arc.

The object of my invention is to so construct an electric-arc lamp of the class above mentioned that the inner arc-inclosing globe shall
25 have its bottom completely and permanently closed and its upper end normally closed.

A further object is to so construct an arc-lamp of the class specified that the pressure
30 of gas in the arc-inclosing globe will be prevented from reaching a point liable to cause the breakage of the globe without the use of valves.

A further object is to so construct an electric-arc lamp of the class above mentioned that it shall be compact, simple, ornamental in appearance, and effectual in all respects in the performance of its functions.

A further object is to provide an electric-arc lamp with simple and efficient means for
40 lowering and sustaining the large outer globe to facilitate trimming the lamp.

A further object is to construct the lamp in such manner that the rheostat can be so dis-
45 posed and arranged as to be efficient and durable.

With these objects in view the invention consists in the combination, with the lamp-arm of an electric-arc lamp and an arc-inclos-
50 ing globe, of a cover for said globe projecting from the lamp-arm and a spring supported by

the lower end of the lamp-arm and acting to force the open upper end of the globe against said cover.

The invention further consists in the com- 55 bination, with the lamp-arm of an electric-arc lamp and an arc-inclosing globe, of a plate made integral with the lamp-arm and forming a cover for the arc-inclosing globe, said plate or cover having a hole for the pas- 60 sage of the upper carbon of the lamp.

The invention also consists in the combina- tion with the carbons of an arc-lamp, of a closed arc-inclosing globe, a cover for said globe, through which the upper carbon passes, 65 a notched flange projecting downwardly from said cover and surrounding the upper end of the globe, and a spring adapted to normally press the upper end of the globe against said cover. 70

The invention further consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 75 is a sectional view of an arc-lamp embodying my improvements. Figs. 2 and 3 are detail views. Fig. 4 is a view of a modification.

A represents a lamp-casing, in which two guide-rods 1 1 are disposed vertically, and 80 from the floor 2 of said casing a thin curved lamp-arm 3 projects downwardly. The lamp-arm is provided at its lower end with a vertically-disposed tubular extension 4 for the accommodation of a rod 5 and a spring 6, the 85 latter having a seat at one end on a shoulder 7 at or near the bottom of the tubular extension 4 and at its other end against a collar 8, secured to the rod 5 within the upper end of the tubular extension 4, said collar 8 and 90 rod 5 being limited in their upward movement by a screw 9 in the upper end of the extension 4.

The upper end of rod 5 is provided with a cup-shaped holder 10 for the reception of a 95 teat or projection on the lower end of an arc-inclosing globe 11. The arc-inclosing globe 11 will thus be yieldingly supported by the spring 6. The bottom of the globe 11 is entirely closed and the upper end of said globe 100 is normally closed by a cover 12, having a ground-glass joint with the globe. The cover

12 is preferably made integral with the arm 3, but may, if desired, be made separate and secured thereto. The cover 12 is provided with a depending notched or scalloped flange 14, which encircles the upper end of the globe 11, the latter being normally forced tightly against the under face of said cover by the spring 6. Instead of providing the cover 12 with the notched or scalloped flange 14 said cover may be provided with a series of depending pins or pegs 15. The cover 12 and the floor of the lamp-casing are made with a hole for the passage of the upper carbon 16, which latter is insulated from the cover 12 by means of a lava bushing 17 inserted in the hole in said cover. The upper carbon is held by a carbon-holder 18, carried by an arm 19, which projects from a block or cross-head 20, but insulated from it, the latter being disposed between and guided by the rods 11. A clutch-blade 21 is also secured to the cross-head 20 and projects downwardly through the lamp-floor and terminates at its lower end in a pocket 22 in lamp-arm 3.

A suitable clutch 23 is adapted to grasp the clutch-blade, and to this clutch an upwardly-projecting rod 24 is connected. The upper end of the rod 24 is pivotally attached to a pivoted lever 25, the other end of which is pivoted to a lug 26, depending from a plate 27, secured to the solenoid 30. The plate 27 is made with a depending arm 28, to which one end of a lever 29 is pivoted, and said levers 25 29 are pivotally connected together between their ends by means of a link 31, and the lever 29 is also pivoted between its ends to the core 32 of the solenoid. The free end of the lever 29 is pivotally connected with the plunger of an air-pot 33.

An arm or bracket 34 projects from the cover 12 or upper portion of the lamp-arm 3 and depends into the arc-inclosing globe 11, terminating at its lower end in a laterally-projecting holder 35 for the reception of the lower carbon 36.

From the construction and arrangement of parts above described it will be seen that when the accumulation of gas in the arc-inclosing globe reaches an abnormal degree, or such degree as to render explosion possible, or should explosion occur, the pressure of the gas would act to depress the globe 11 against the resistance of the spring 6, which latter will of course be adjusted to withstand a predetermined pressure. A very slight descent of the globe will cause its upper edge to pass below the upper ends of the notches in the flange 14, and thus numerous gas outlets or vents will be formed at the upper edge of the globe. It is apparent that the movement of the globe for this purpose need be but very slight and that as soon as the pressure within the globe is relieved the latter will be immediately forced up against its seat on the cover 12 and the globe again tightly closed without admitting air. In lamps of this class it is important that the arc-inclosing globe be air-tight

below and for some distance above the arc. The products of the arc which settle in the globe and expel the air must rise above the arc to insure duration of the carbon points. This is best attained by a globe having no openings through its glass except at a point above the arc. My arrangement, therefore, of a bracket or arm to descend from the lamp parts above down into a cup-shaped globe and hold the lower carbon in proper alignment with the upper is valuable, for instead of the lower carbon entering one opening in the bottom of the globe and the upper carbon another opening at the top the lower or difficult opening to keep air-tight is dispensed with.

B represents a frame adapted to be secured to the ceiling of a room or other place and to the center of the base-plate 37 of which a hook 38 is secured, said hook depending through the center of the skeleton cover 39 of said frame B and adapted to receive a hook or link 40, secured to the lamp-casing. A series of insulators 41 is secured to the base-plate 37, and on these insulators two sections *x y* of resistance are supported. The sections of resistance are electrically connected at their ends to plates *a b* and *c d*, respectively. The current from the line first passes through one section of the resistance and then to the positive terminal of the lamp, which is connected with one end of the coil of the solenoid, and the other end of said coil is connected, by a flexible conductor *e*, with the upper-carbon holder. The current passes from the upper to the lower carbons, then through the bracket supporting the lower carbon to the cover 12 or arm 3 and guide-rods 11 to the minus terminal of the lamp, and thence through the other section of the resistance to the line.

The large outer globe 42 is supported by a globe-holder 43, and the latter is removably secured to the extension 4 of the lamp-arm 3. The globe-holder is connected with the lamp-arm 3 by means of a chain 44, so that when the outer globe and its holder are removed while the lamp is being trimmed they will be supported in a suspended position by the said chain.

My improvements are simple in construction, comprise few parts, and are effectual in all respects in the performance of their functions.

Slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein set forth; but,

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

1. In an arc-lamp, the combination with the lamp-arm and an arc-inclosing globe, of a rigid plate projecting laterally from said lamp-arm and constituting a cover for said arc-inclosing globe, said plate or cover having a hole for

the passage of the upper carbon and a spring constructed to force said globe against said plate or cover, substantially as set forth.

2. In an arc-lamp, the combination with the lamp-arm and an arc-inclosing globe, of a plate made integral with the lamp-arm and forming a cover for said arc-inclosing globe, said plate or cover having a hole for the passage of the upper carbon of the lamp, substantially as set forth.

3. In an arc-lamp, the combination with the lamp-arm and an arc-inclosing globe, of a cover for said globe projecting from the lamp-arm, and a spring supported by the lower end of the lamp-arm and acting to force the open upper end of the globe against said plate or cover, substantially as set forth.

4. In an arc-lamp, the combination with the frame thereof, and an arc-inclosing globe, of an integral arm or plate projecting from said frame and constituting a fixed cover for said globe, substantially as set forth.

5. In an arc-lamp, the combination with a lamp-arm and an arc-inclosing globe open only at its upper end, of a fixed cover for said globe projecting from the upper end of the lamp-arm and having a hole for the passage of the upper carbon, a spring supported by the lower end of the lamp-arm for forcing the upper edge of the globe against said cover and an arm secured to said cover and projecting down into the globe for supporting the lower carbon, substantially as set forth.

6. The combination with the lamp-arm, the upper portion of which is formed to close the opening in an arc-inclosing globe, of an arc-inclosing globe having but this one opening, a bracket or arm to descend into said globe and arranged to support in proper position the lower carbon and a spring attached to said lamp-arm to elastically hold the arc-inclosing globe as set forth.

7. The combination with the carbons of an arc-lamp, of an arc-inclosing globe having a close-fitting cover, and a flange depending from said cover and encircling the upper end of the globe, said flange having an irregular free edge, substantially as set forth.

8. The combination with the carbons of an arc-lamp, of an arc-inclosing globe, a cover for said globe, through which the upper car-

bon passes, a notched flange projecting downwardly from said cover and surrounding the upper end of the globe, and a spring adapted to normally press the upper edge of the globe against said cover, substantially as set forth.

9. In an arc-lamp, the combination with an air-tight arc-inclosing globe and the lamp-arm, of a bracket projecting into said arc-inclosing globe from said lamp-arm and a lower-carbon holder at the free end of bracket, substantially as set forth.

10. In an arc-lamp, the combination with the casing of a lamp-arm having a vertical tubular extension, a rod passing into said tubular extension, a collar on said rod, a spring in the tubular extension and bearing at its lower end on a shoulder therein and at its upper end against said collar, a holder at the upper end of said rod, an arc-inclosing globe supported by said holder and a fixed cover for said globe, substantially as set forth.

11. In an arc-lamp, the combination with the casing, of a lamp-arm depending therefrom, a vertically-disposed tubular extension at the lower end of said arm, a rod entering said tubular extension, a collar on said rod, a spring in said tubular extension bearing at its lower end on a shoulder at the lower end thereof and at its upper end against said collar, and a cover for said globe projecting from and made integral with the upper portion of said lamp-arm, substantially as set forth.

12. In an arc-lamp the combination with the separating and feeding solenoid, the carbons and a clutch, of a lever having a pivotal support at one end and at its other end connected with the clutch, an air-pot, a lever pivoted at one end and connected at its other end with the plunger of said air-pot and between its ends with the core of said solenoid, and a link pivotally connecting said levers together at points between their ends.

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

THOMAS EDGAR ADAMS.

Witnesses:

R. L. HOLMES,
ED. T. HOLMES.