No. 815,777. PATENTED MAR. 20, 1906.

D. ANDERSON.

BURNER FOR INCANDESCENT GAS LIGHTING.

APPLICATION FILED JAN. 24, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

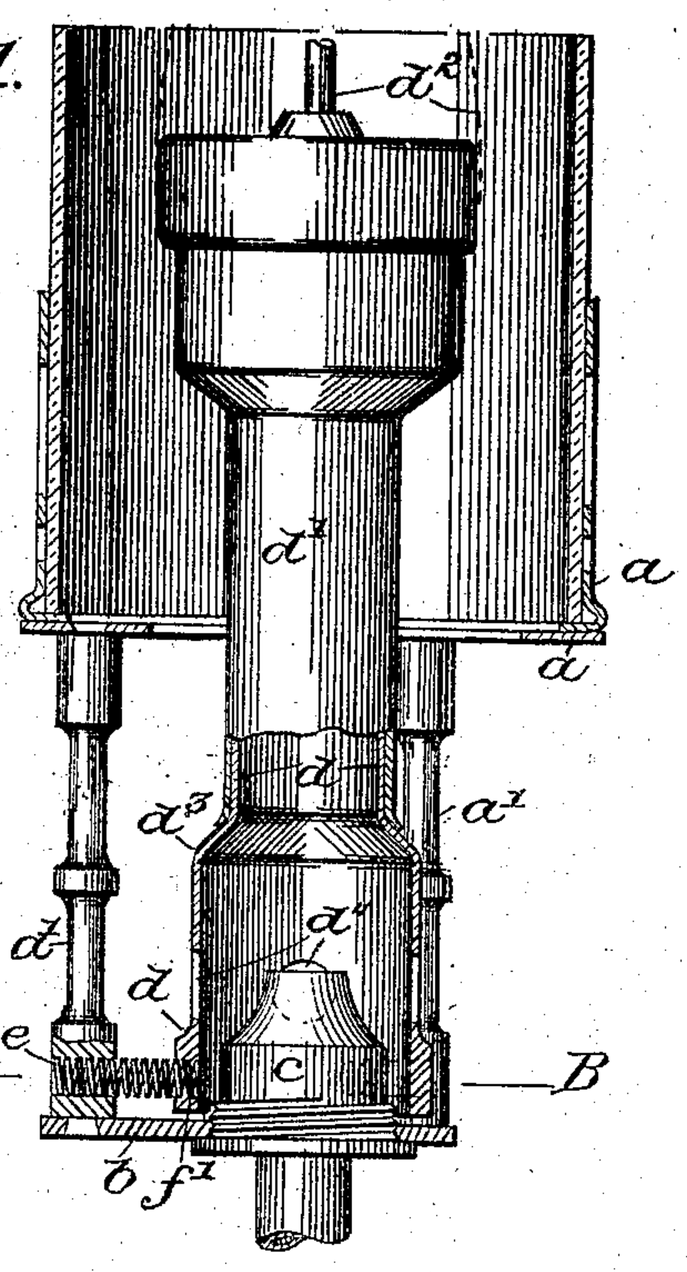

Fig. 3.

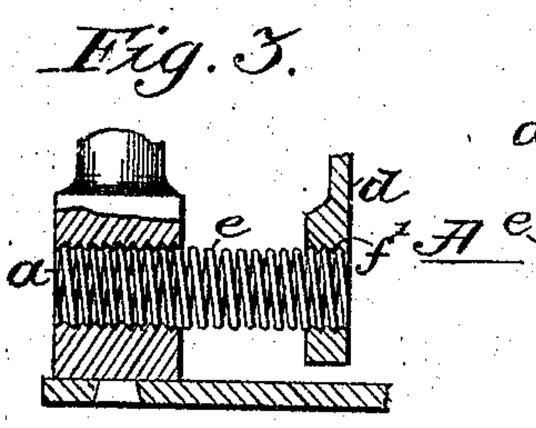

Fig. 4.

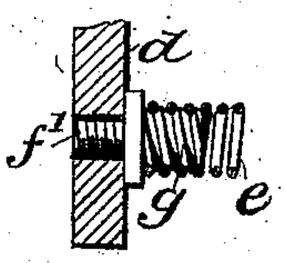

Fig. 2.

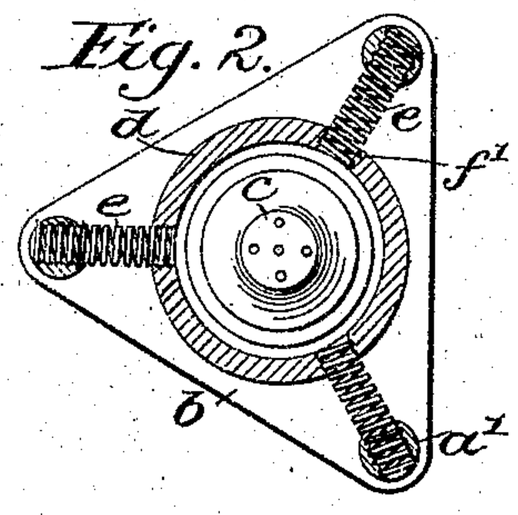

Fig. 5.

Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 7.

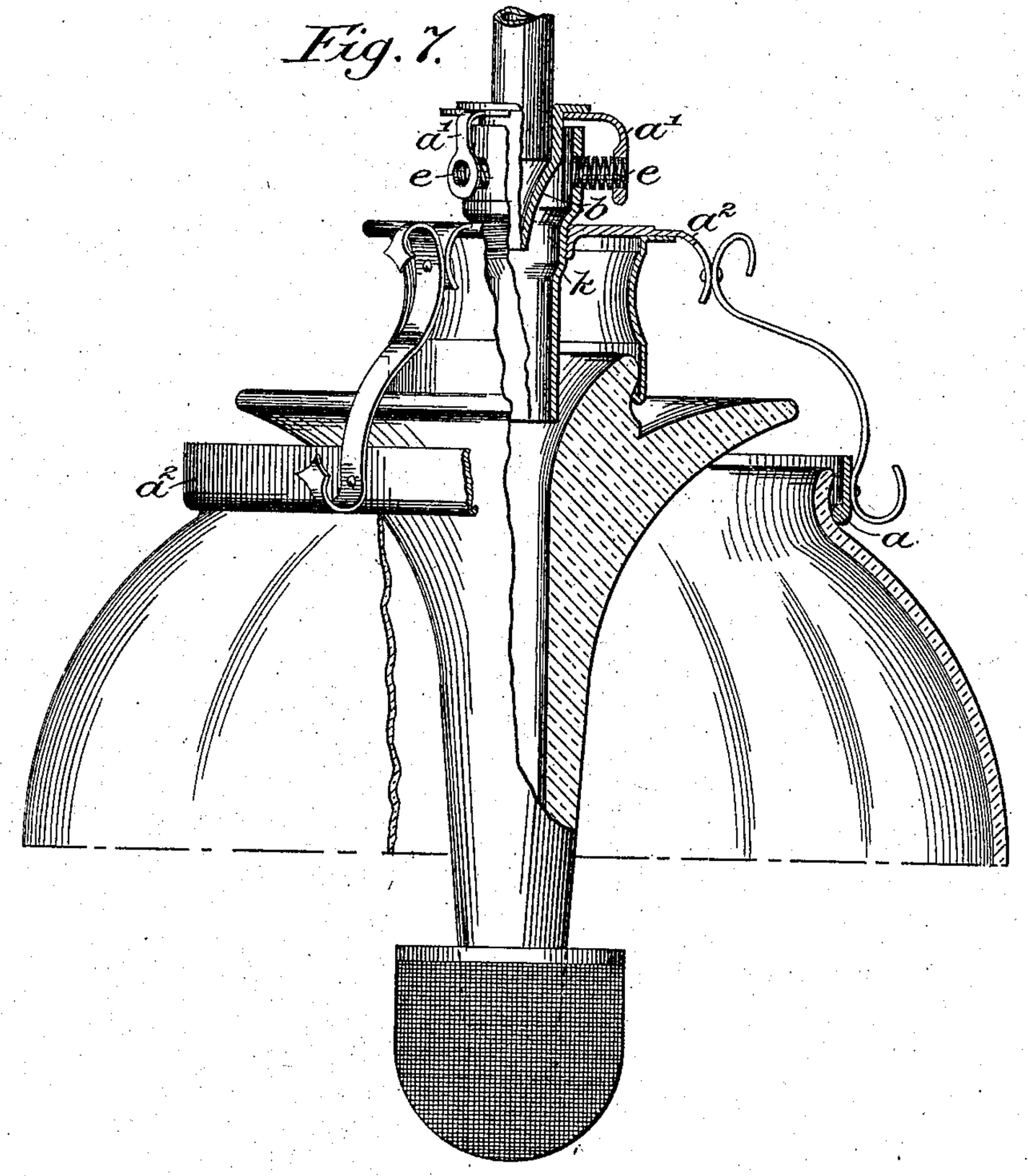
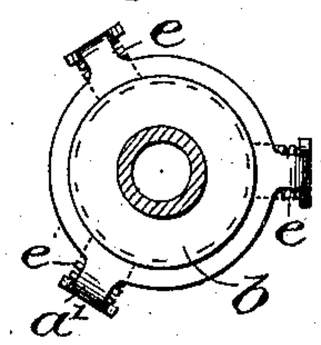


Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID ANDERSON, OF WESTCLIFF-ON-SEA, ENGLAND.

BURNER FOR INCANDESCENT GAS-LIGHTING.

No. 815,777. Specification of Letters Patent. Patented March 20, 1906.

Application filed January 24, 1905. Serial No. 242,574.

To all whom it may concern:

Be it known that I, DAVID ANDERSON, engineer, a subject of his Majesty King Edward VII of Great Britain and Ireland, residing at Westcliff-on-Sea, Essex, England, have invented new and useful Improvements in or Relating to Burners for Incandescent Gas-Lighting, of which the following is a specification.

This invention relates to burners for incandescent gas-lighting, and has for its object to provide an improved antivibration burner.

It has hitherto been proposed to employ in various ways radially-arranged springs for the prevention of transmission of lateral vibrations to an incandescent burner and also to use radially-arranged elastic tubes conveying gas to the burner for this purpose; but it has been found that none of these devices are satisfactory or convenient, because as applied they are either not effective for the stopping of vibration from all directions or they seriously obstruct the light given by the burner, or, again, they are troublesome to manufacture and adjust, mainly owing to having too many points of support.

The object of the invention is to overcome these and other difficulties and to avoid the use of flexible gas-supply pipes.

This invention, therefore, consists in separating the burner-head, together with the whole or a part of the mixing-tube, from the gas-supply nipple and the fixed parts from which the latter is carried and in supporting the said separated parts from the fixed parts by means of three or more symmetrically-disposed springs acting by both their axial and transverse resiliency and of such elasticity and stiffness that they will absorb both vertical vibrations and lateral vibrations in all radial planes through the axis of the burner and yet of such compact form and disposition that they do not substantially obstruct the light.

In carrying out my invention it is preferred to employ springs of elastic wire closely coiled, so as to form resilient screws which bend under vertical vibrations and which are axially resilient under lateral vibrations in any plane radial to the burner, the ends of the springs being supported in screwed sockets and adjusted by rotation.

For a full understanding of my invention reference is made to accompanying drawings, wherein—

Figure 1 is a vertical section, partly in elevation, of a preferred form of burner. Fig. 2 is a transverse section on line A B of Fig. 1. Figs. 3, 4, 5, and 6 are views illustrating several attaching devices for the supporting-springs. Fig. 7 is a vertical section, partly in elevation, of an inverted burner; and Fig. 8 is a plan view of the upper portion of the burner shown in Fig. 7.

In the figures, *a* is a gallery supporting the globe or chimney and itself supported from a suitable base-plate *b* by pillars *a'*. Through the plate *b* projects a gas-supply jet or nozzle *c*, the said plate screwing thereonto. Within the said gallery *a* and concentric therewith is disposed a tubular part *d*, which supports or constitutes the burner member *d'* and carries the mantle-rod and mantle d^2. The inner tubular part is or may be increased in diameter at its base, as at d^3, and is suspended over the gas-jet *c* without connection therewith and forms the gas and air mixing chamber, to which air is admitted by holes d^4 in the usual manner. The member *d* is supported from the pillars *a'* by means of symmetrically-disposed radial springs *e e e*, which, as before described, act by both their axial and transverse resiliency and are of such elasticity and stiffness that they will absorb both vertical and lateral vibrations in all planes radial to the axis of the burner, said springs being also of such compact form that they do not substantially obstruct the light. In a burner as shown in Figs. 1 and 2 and of the proportions herein given I find very satisfactory results are obtained if the springs are made of steel music-wire, gage No. 8.020 or 11.026, or thereabout. It is to be understood that I do not bind myself to this particular type of wire.

The springs may be fixed in any suitable manner; but the drawings show an approved form, wherein the screws are formed in the manner of resilient screws and the inner tubular member is formed with holes *f''*, corresponding with other holes in the pillars *a'*. The said holes are tapped with a screw-thread of the same or approximately the same pitch as the winding of the resilient screws or a pitch to which the said winding will conform. In assembling the parts the resilient screw is screwed through the hole in the pillar until it reaches across the intervening space and is screwed into the hole in the inner member *d*.

The ends of the spring may be left open, so that air may pass therethrough, or the apertures may be closed by suitable studs or

plugs. This method of fixing the resilient members is more clearly shown in Fig. 3, which is a section through the hole in the pillar a' and member d, drawn to a larger scale. In a modified form shown in Fig. 4, which is a section of the lower part of member d and spring e, (also to a larger scale,) the spring e is screwed onto a stud g, which is then screwed into the hole f' in the member d. If required, however, the studs may be formed in one with the member d and tapped as required. Fig. 5 is a similar view to Fig. 3, showing how the resilient member e may be fastened by means of screwing the same onto a stud g similar to that shown in Fig. 4 on the member d and also secured to the pillar a' by a similar stud g', which may be formed with a suitable head g^2, by which the tension or position of the resilient member e may be adjusted to properly centralize the member d. Fig. 6 is another view, similar to Fig. 3, showing a modified form wherein the resilient member e may be screwed into recesses h and h', respectively, in the pillar a' and the member d. The recesses are shown as being formed with threads for screwing in the resilient member e, and so securing the desired firm attachment; but, if required, by making the resilient member a reasonably tight fit as regards diameter and making them of such length as to be in compression when in position the screw-thread might be omitted. It may be mentioned, however, that a great advantage of the forms shown in Figs. 1, 2, and 3, where no studs are used, is that the resilient members can be of short length and the surrounding parts can be more compact, and, further, the springs and parts may be more easily assembled and the central member d' more quickly centralized, as it is only necessary to screw in the resilient members through the respective holes while the central member is held in position and then cut off any projecting portion of the resilient member, or, if short lengths are used, they can conveniently be screwed back and forth until correct.

Fig. 7 shows the application of the invention to an inverted burner, wherein the resiliently-supported member consists of arms a^2, carrying the gallery a, mounted upon the depending tubular part k, which supports the mantle and forms the burner. The part k is supported at its upper end from arms or members a' by means of resilient members e, suitably formed and fixed, as before described, to the fixed part b of the burner.

Fig. 8 shows the upper part of the burner of Fig. 7 in plan. A screen or shield of refractory material may be disposed just below the springs e to further protect them from the heat of the burner. By this construction the resilient members are kept cool by the draft of air to the burner and protected from the heat by their position.

Resilient members of the form and disposition herein specified possess considerable advantage in their action over springs in the forms and positions hitherto adopted for antivibration purposes, because in the improved construction they will absorb both lateral and vertical vibrations in all radial planes, and so allow freedom of motion in all directions; but they nevertheless possess sufficient strength to form a good and stable support for the burner.

I find springs such as referred to when formed a comparatively tight fit either upon the outer surface of a stud or the inner surface of a hole can by being put in position by a screwing motion obtain an effective grip sufficient to prevent their being withdrawn other than by a reversal of the screwing action.

It will be understood that the spring-supported member d may be modified in form to adapt it for use with any existing form of burner. For instance, I may construct this member as a separate sleeve or socket adapted for attachment to existing burners and serving to resiliently support the air-mixing chamber and burner-head.

I claim—

1. An attachment for incandescent gas-lighting, comprising supporting and supported members, and radial helical springs engaging said members and sustaining the supported member, at least one of said engagements being adjustable, substantially as described.

2. An attachment for incandescent gas-lighting, comprising supporting and supported members, and radial helical springs adjustably engaging both of said members, substantially as described.

3. An attachment for incandescent gas-lighting, comprising supporting and supported members, radial helical springs adjustably engaging one at least of said members and sustaining the supported member, and a burner-head carried by the supported member, substantially as described.

4. An attachment for incandescent gas-lighting, comprising supporting and supported members, and radial helical springs sustaining the supported member, the end helices positively engaging said members, substantially as described.

5. An attachment for incandescent gas-lighting, comprising supporting and supported members, and radial helical springs sustaining the supported member, the end helices adjustably engaging one at least of said members, substantially as described.

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

DAVID ANDERSON.

Witnesses:
H. D. JAMESON.
F. L. RAND.