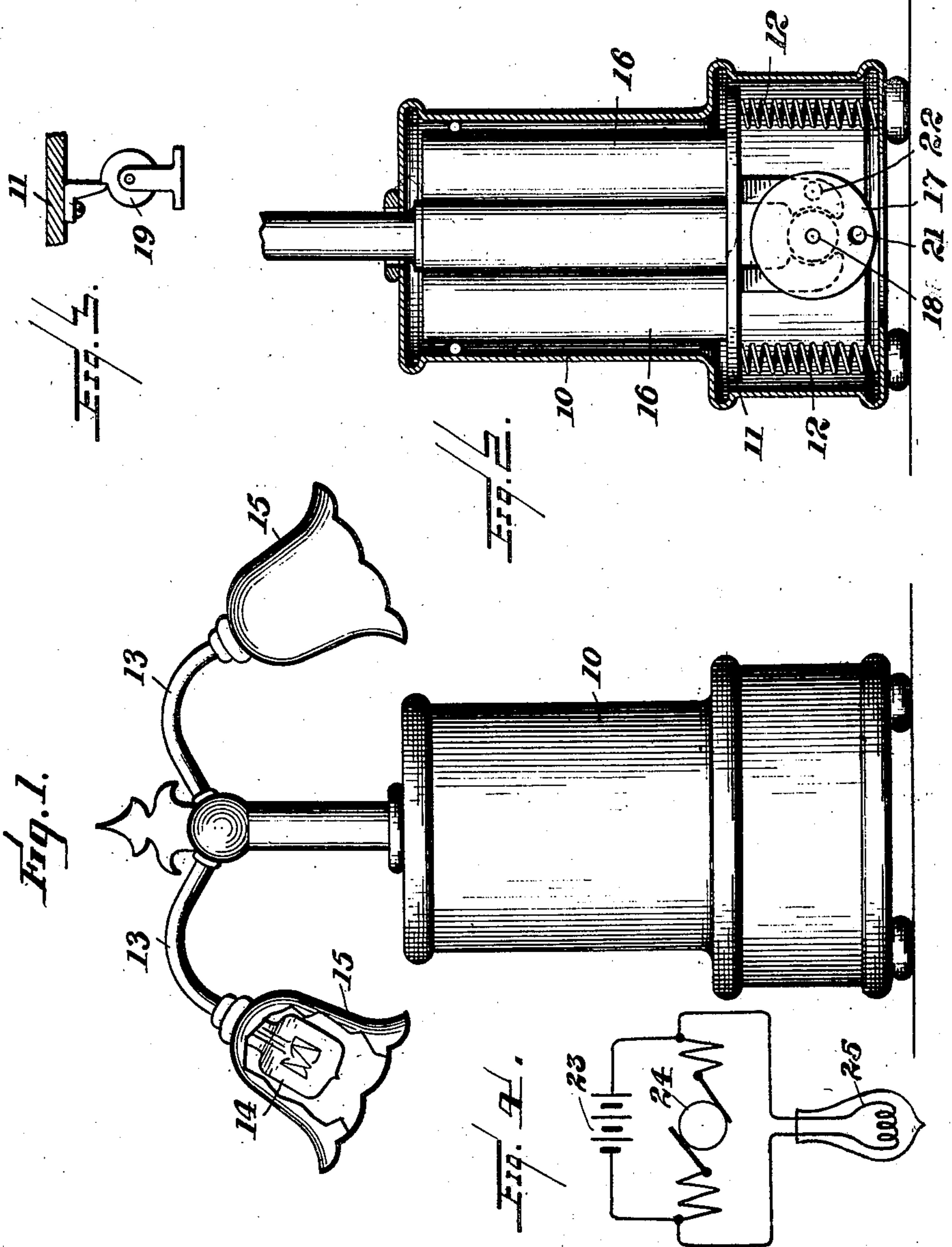


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PATENTED DEC. 17, 1907.

E. A. SPERRY.
ELECTRIC LIGHTING.

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WITNESSES:

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ELECTRIC LIGHTING.

No. 873,804.

Specification of Letters Patent.

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To whom it may concern:

Be it known that I, ELMER A. SPERRY, a citizen of the United States, and a resident of Brooklyn, county of Kings, State of New York, have invented a certain new and useful Improvement in Electric Lighting, of which the following is a specification.

My invention relates to a system of electric lighting and it consists in an adaptation of means whereby the useful life of the incandescent lamp provided with a weldable filament can be increased, and also means whereby such lamp may be furnished with direct currents of low voltage for a longer period, or with the same amount of energy from a lighter and smaller chemical generator than heretofore possible, all of which is of special advantage in cheapening and rendering more practicable small lighting units or installations, and produces an efficient system of distribution or delivery of electrical energy in stored form from storage batteries for lighting purposes, and especially for temporary uses and at points not reached by systems of electrical distribution. Its application may be extended, but in this field the obtaining of extended life and long duty of either or both the lamps and battery play an important part and operate to render such distribution system successful.

It has been found that metal or metallized filament incandescent lamps especially those of low candle power are more practical with low voltages than with high voltages and the wire or filament between supports may be made shorter or the lamps may have so few supports that the filament itself may be smaller than with the higher voltage lamps, and, therefore, more efficient than the high voltage lamps. The finer filament is of the greatest durability for lamps of moderate candle power, and has special value in connection with the present improvements.

It is a fact that filaments of metal or metallized filaments of electric lamps, unlike those of carbon, are self-welding, that is the broken and apparently useless filament of such a lamp, when its ends are brought together or in contact with other parts, will become united or welded and the lamp will again become useful and so continue for a considerable additional period of time. I have found

that a continuous motion of vibration or agitation, and especially a motion in a plurality of planes, or so to speak, a universal motion is best adapted for this purpose. I have moreover found that the best results in this line are obtained when practically no time is lost between the instant of rupture and the effective operation of the vibration, so that the dismembered parts of the filament may be brought into contact and the weld may take place while the filament is still at or near its full temperature, which is known to be very high. This time interval is of appreciable duration as convection, the most potent factor in cooling, in an exhausted electric lamp of this class, is entirely absent, and therefore a period of time exists which I have found to be most favorable for the re-uniting of the filaments or parts thereof. Thus it will be seen to be desirable that no time shall be lost, and since in the present invention the operation of the lamp is under conditions of suitably intermittent or practically continuous motion or vibration, during its operation the lamp while being apparently uninterrupted may have actually failed, the filament parted and then welded again before the radiation had had time to die down or the lamp become dimmed.

I further provide that the battery shall be affected by motion or vibration. Motion and agitation generally are beneficial to chemical actions and re-actions. By agitation the tendency to impoverishment of the active material, or the active radical or element, may be almost entirely corrected and the activities made more effective, materials acted upon more deeply than where quiescent. Again insulating oases or bubbles of such gases occluded or developed at the active surfaces are dislodged and not allowed to collect. When they do so collect they cut down both the voltage and output of batteries, either primary or storage batteries, as is well known. Of course violent shocks are detrimental to batteries and lamps as well, but these are not included in the motion specified and set forth in connection with this invention.

One method of carrying out my invention is shown in the accompanying drawings which serve to illustrate one of the many

forms in which it may be embodied; these drawings represent an electric lighting unit under this invention.

Figure 1 is an elevation of a complete unit embodying my invention. Fig. 2 is a vertical section of the same, Fig. 3 is an alternate form of the vibrator. Fig. 4 is a diagrammatic view showing the way in which the circuits are connected.

In a container 10 which may be suitably ornamented is a support 11 herein shown as being horizontally adapted for movement, preferably movements in various directions or in a plurality of planes. As one means of accomplishing this, springs 12, 12 are used to sustain the support 11, together with its connected parts, preferably in a state of balance or equilibrium, that is such a balance that very little energy is required to disturb, move or vibrate same; this support serves to carry the arms 13, 13 carrying the weldable-filament lamps 14, 14, shades 15, and any other devices usually employed with the lamps, together with any electric circuits necessary for their electrical supply. In the present instance upon the platform or support 11 is mounted the battery 16 or a number of cells of battery (any chemical generator of electrical energy) but preferably storage batteries are shown as being used in the present instance; the arrangement being such that a common vibrator as 17 will serve to communicate motion to the lamp or lamps and also to the batteries. This means of moving the parts shown at 17 performs its work with but very little effort or expenditure of power as only a few watts of energy are required. This power may be furnished from any suitable source of supply, either mechanical or electrical, but the arrangement shown in Fig. 2 involves the use of an electric motor connected with the support 11. The power from this motor may be used or utilized in any manner to move or cause motion, preferably continuous motion or vibration, of the parts, for instance the operation of the cam 19, see Fig. 3, or the motor may be connected to the platform as shown in Fig. 2 and upon its shaft 18 two fly-wheels are used, one back of the other, which are preferably out of balance as by the drill hole 21 in the disk of the wheel, the other wheel being out of balance by the hole 22, shown in dotted lines. It will be noticed that the relation of the holes 21 and 22 are on the quarter or 90° from each other. Such an arrangement causes a peculiar movement of the parts as will readily be understood. This movement involves vibration in a number of different planes and is important to the present invention as it increased the liability of the filament-portions being brought into contact which under the conditions of full impressed electro-motive

force from the source of electric supply or potential causes their instant welding and the reunited filament to again glow, giving light as before. This electrical energy may be from any suitable source as well as that which supplies the motor, or they may draw their energy from the same source of supply.

It will be understood that by incandescent lamp and incandescent filament I refer to an electric lamp in which the continuous incandescence of the filament is depended upon as the source of light, and that where I refer to the motion or agitation of the filament or lamp I mean such an agitation as will tend to carry together the ends of a broken filament.

In Fig. 4 I have shown diagrammatically a battery 23 having circuit connection with the motor 24 and the lamp 25 and as clearly shown here the lamp and motor are supplied from the same source. It is of course to be understood that suitable switches are to be placed in the circuit.

It will be readily understood that the agitation herein referred to may be from any suitable source and the system as a whole may be in any form and differ widely as to size and extent, the invention having a wide range of usefulness in the art to which it relates.

Without limiting myself to the precise construction and arrangement of parts shown in the drawing, I claim as my invention:

1. An electric lamp having a continuous weldable incandescent filament, a support for such lamp, a source of electrical supply, and means for agitating the support and imparting such a movement to the filament as will bring broken parts thereof together while the filament is connected with such source.

2. An electric lamp having a continuous weldable incandescent filament, a support for such lamp, a source of electrical supply, and means for imparting practically continuous motion to the support such as will bring broken parts of the filament together while the filament is connected with the said source.

3. An electric lamp having a continuous weldable incandescent filament, a support for such lamp, a source of electrical supply, and means for imparting motion in a plurality of planes to the support such as will bring broken parts of the filament together while the filament is connected with such source.

4. An electric lamp having a continuous weldable incandescent filament, a support for such lamp mounted in equilibrium upon resilient members, a source of electrical supply for such lamp, and means for imparting

motion to the support mounted as described while the filament is in connection with the said source.

5 5. An electric lamp having a continuous weldable incandescent filament, a support for such lamp mounted in equilibrium upon resilient members, a source of electrical supply for such lamp, and means for imparting vibration in a plurality of planes to the support while the filament is connected with such source.

15 6. In a weldable filament incandescent electric lamp having a continuous incandescent filament, a source of electrical supply consisting of a battery, a support common to the battery and the lamp, and means for imparting motion to the support while the filament is connected with the source.

20 7. In a weldable filament incandescent electric lamp, a source of electrical supply consisting of a battery, a support common to the battery and the lamp, and means for imparting vibration in a plurality of planes to the support while the filament is connected with the source.

25 8. In a weldable filament incandescent electric lamp, a source of electrical supply consisting of a battery, a support common to the battery and lamp, means for mounting such support in equilibrium on resilient members, and means for imparting motion to the support so mounted while the filament is connected with the source.

30 9. In a weldable filament incandescent electric lamp, a source of electrical supply consisting of a battery, a support common to the battery and lamp, means for mounting such support in equilibrium on resilient

members, and means for imparting motion in a plurality of planes to the support so mounted while the filament is connected with the source. 40

10. A weldable filament incandescent electric lamp, a support for such lamp, a source of electrical supply, and means for imparting motion to the support such as will bring broken parts of the filament together, the lamp and means deriving energy from the same source. 45

11. A weldable filament incandescent lamp, a support for such lamp resting upon resilient members, a sub-base for receiving such members, resilient supports for such sub-base, and means for imparting vibration to the said lamp such as will bring broken parts of the filament together. 50 55

12. A weldable filament incandescent electric lamp, combined with means for agitating the lamp and imparting such a movement to the filament as will bring broken parts thereof together while the filament is in connection with a source of electrical potential. 60

13. The combination of a weldable filament incandescent electric lamp, a support therefor, and means for agitating the support with the lamp and imparting such a movement to the filament as will bring broken parts thereof together while the latter is in connection with a source of electrical supply. 65 70

In testimony whereof I affix my signature in presence of two witnesses.

ELMER A. SPERRY.

Witnesses:

EMIL J. VILLANYI,

JOHN MALONES.