

Nov. 26, 1929.

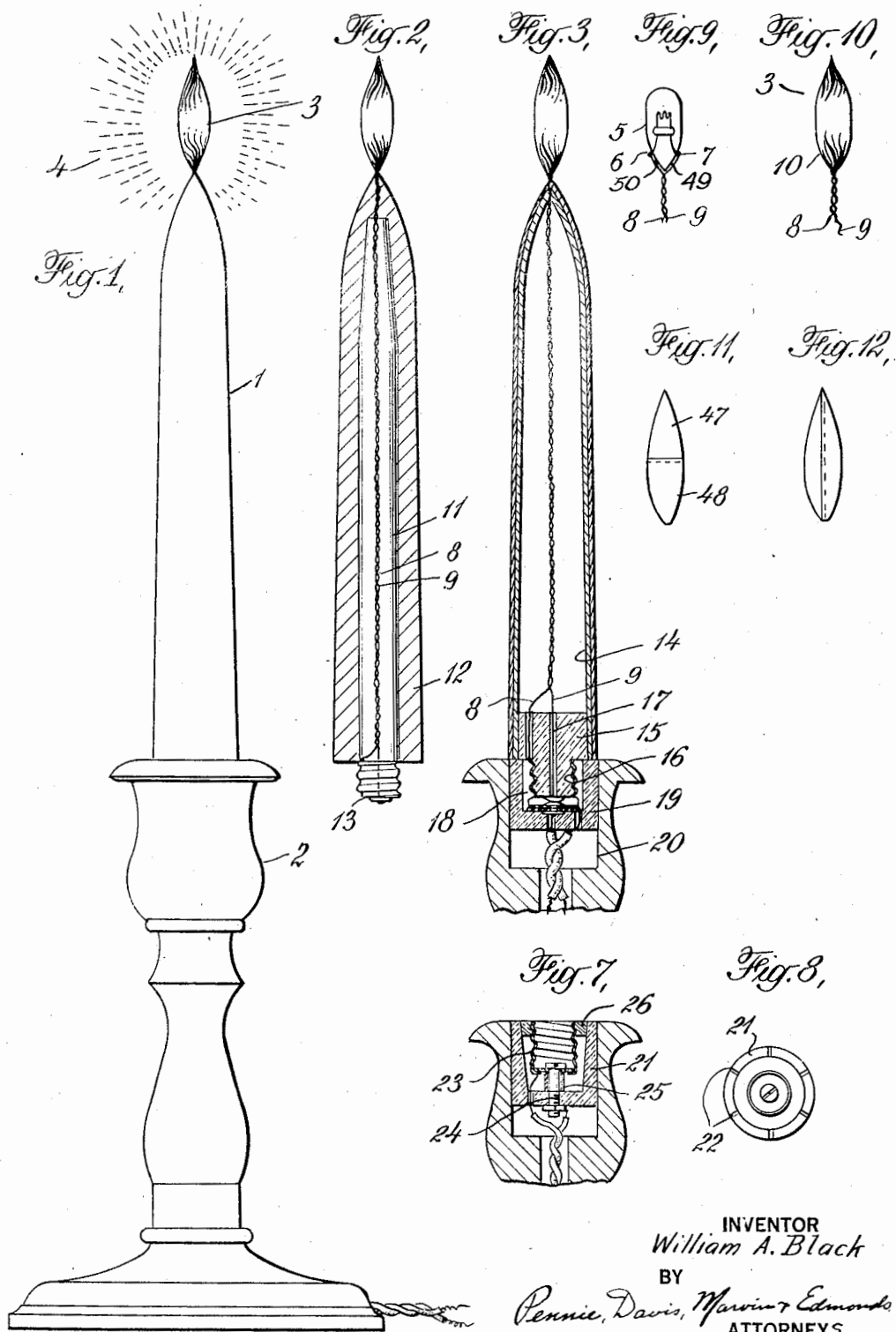
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1,736,820

ELECTRIC CANDLE

Filed July 15, 1926

2 Sheets-Sheet 1



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Fig. 4,

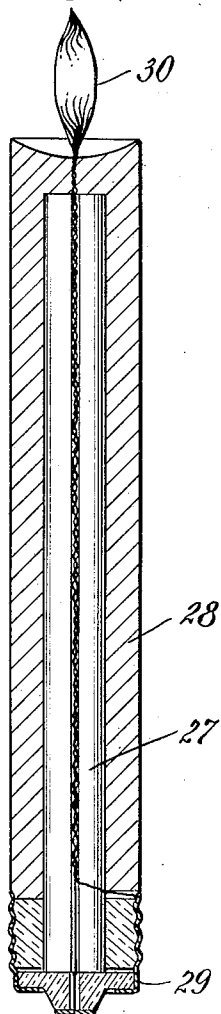


Fig. 5,

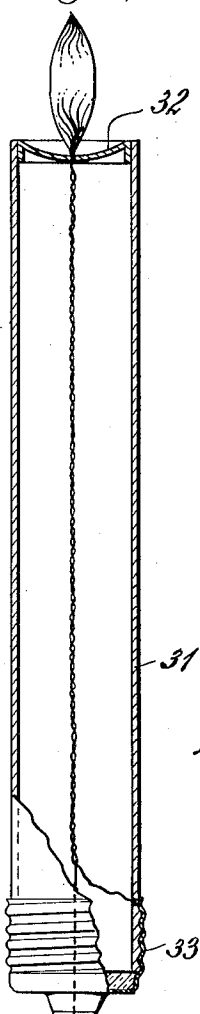
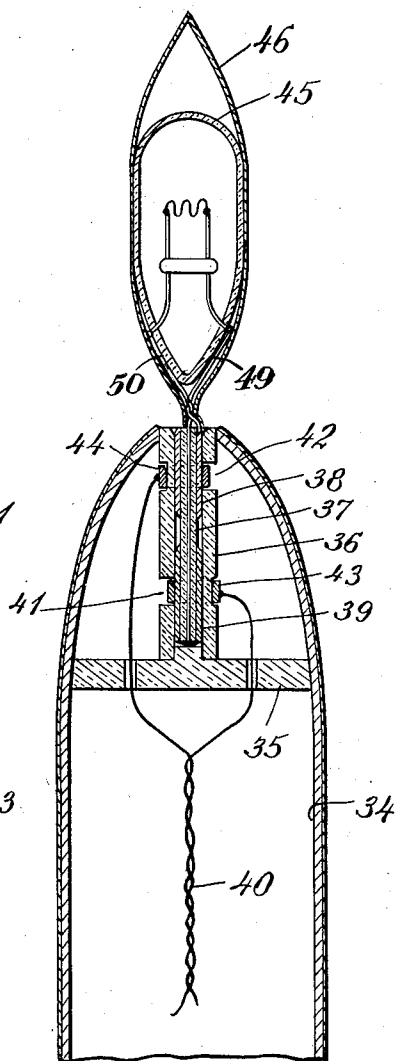


Fig. 6,



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ELECTRIC CANDLE

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This invention has to do with so-called electric candles, that is to say, electric lamps designed to simulate candles, and its primary object is to accomplish a truly realistic effect in imitation of a real burning candle.

An examination of the prior art indicates that an electric candle has never been produced heretofore which would, when lighted, convey a truly realistic effect or illusion. This effect can be accomplished in electric candles in accordance with the preferred embodiments of the present invention to the extent that when viewed from a distance of a few feet the illusion is almost, if not entirely, perfect. Observing such an electric candle from a distance of a few feet when lighted in an otherwise dark or dimly lighted room, it is seldom that anyone who is not informed recognizes it as anything but a real candle.

Within the scope of this invention, the desired result can be obtained to a greater or less extent in a number of ways but the most realistic effects have been accomplished by mounting a small incandescent electric bulb at the tip of a candle-like body, wrapping the bulb with translucent sheet material such as tissue paper, forming the wrapper into the shape of a candle flame and dipping it into a translucent adhesive binder such as shellac, thereby either coating or impregnating the wrapper with the adhesive binder. Preferably an electric bulb without the usual base is utilized, and the lead-in wires which pass through the glass shell of the bulb may be connected directly to a pair of small twisted wire conductors which extend through the body of the candle and protrude from the tip of the candle body like a wick. These wires, though small, are sufficiently rigid to hold the small electric bulb and its wrapper in an upright position. This arrangement, by doing away with the usual lamp base, facilitates constricting the wrapper to a narrow diameter (similar to that of the base of

a real candle flame) at a point below the electric bulb thereby helping to carry out the desired illusion.

The effect of the translucent wrapper coated or impregnated with shellac, or one of its many equivalents, is to render the visible characteristics of the emitted light very similar to that of a real candle flame. Both the color and other visible characteristics are closely approximated by virtue of this wrapper. The shellac coating or impregnation gives the wrapper a sort of semi-transparent glass-like quality which passes light of a candle flame color and texture while at the same time the short brilliant rays of light which emanate from a candle flame and form the corona are reproduced. The reproduction of the corona contributes materially to the realistic effect.

With respect to the simulation of a candle flame, the invention has three aspects. One of these relates to the matter of truthfully reproducing the contour of a real candle flame irrespective of the employment of special means for obtaining an approximately true simulation of the color and texture of real candle light. Another aspect of the invention relates to the use of specially prepared wrappers such as tissue paper coated or impregnated with shellac for reproducing the color and other visible characteristics of a real candle flame without regard to accurately reproducing the contour of a real candle flame. The third aspect of the invention relates to the combination of the first two, that is, to the simulation of a candle flame both as to truthfulness of contour and as to color and other visible characteristics.

Although the best results have been obtained with a light-emitting element comprising a small electric bulb of about two candle power (without a screw base) wrapped in tissue paper dipped in shellac and formed, by twisting, into the shape of a candle flame, that is, pointed at the tip and constricted at

the base to a diameter of the order of that of a candle wick, the invention is not by any means limited to that recipe. In the first place there are many substitutes for shellac, some of which will give equally as good and others approximately as good results. These include various varnishes and lacquers such as the well-known cellulose nitrate and cellulose acetate lacquers and phenolic condensation products. Then, too, it is not essential to use tissue paper as a wrapper. Coated or impregnated woven fabric will give somewhat the same results as tissue paper. Suitable wrappers may also be made of celluloid, pyroxylin and the like. Wrappers of these materials can be molded in two pieces, which, when put together, form an envelope for the electric bulb. Such wrappers can be colored so as to render the emitted light very similar to that of a real candle.

Irrespective of the use of a wrapper or other special treatment, the invention includes within its scope electric candles in which the simulated candle flame is produced by an electric bulb shaped to conform to the contour of a candle flame and having supporting means of a diameter of the order of that of a candle wick so that when the bulb is lighted the appearance, as to contour, is like that of a candle flame in that the base of the flame tapers down to the diameter of the wick at the top end of the candle body.

The invention also includes certain novel features relating to the construction of electric candles and accessories thereto all of which are disclosed in the accompanying drawings and described in detail hereinafter.

In the drawings:

Fig. 1 is an elevational view of an electric candle in accordance with the preferred embodiment of this invention together with a portion of a candle stick in which the electric candle is mounted;

Fig. 2 is a longitudinal section through a candle like that of Fig. 1;

Fig. 3 is a longitudinal section through an electric candle in which the candle body is of different construction than that of Fig. 2;

Fig. 4 is a longitudinal section of an electric candle of a different design;

Fig. 5 is a longitudinal section of an electric candle similar in design to that of Fig. 4 but of different construction;

Fig. 6 is an enlarged sectional view through the top of an electric candle having a removable light-emitting element;

Fig. 7 is a sectional view illustrating an expanding adapter for holding an electric socket in a candle receptacle;

Fig. 8 is a plan view of the adapter and socket of Fig. 7;

Fig. 9 shows a small incandescent electric bulb with electric wires attached—preparatory to being wrapped;

Fig. 10 shows the wrapper applied to the bulb of Fig. 9;

Fig. 11 illustrates a two part celluloid wrapper which may be used as an alternative to the tissue paper wrapper; and

Fig. 12 illustrates another two part celluloid wrapper which may be used alternatively to that of Fig. 11.

Referring, first, to Fig. 1 which illustrates an electric candle in accordance with one of the preferred embodiments of this invention, a candle body 1 made to simulate a real candle is mounted in a candlestick 2. The light-emitting element 3 is made to simulate a candle flame both as to contour and size. When in operation, the light-emitting element 3 is completely illuminated from base to top. When the semi-transparent wrapper enveloping the incandescent bulb of the light-emitting element consists of tissue paper coated with shellac, the corona effect indicated at 4 is present. The corona effect is closely similar to that present about the flame of a burning-wick candle. Also, when the wrapper consists of tissue paper coated with shellac the color and quality of the light closely simulates that of a burning wick candle.

In order to carry out the desired effect most realistically, the juncture between the base of the light-emitting element and the top or tip of the candle body is constricted, as shown, to a diameter of the order of that of a candle wick.

The construction of a suitable light-emitting element is illustrated in Figs. 9 and 10.

The incandescent electric bulb 5 shown in Fig. 9 should be of about two candle power for an electric candle intended to simulate a burning wick candle of ordinary size. The size and candle power of the bulb should, of course, be selected in each instance with a view to appropriateness, depending upon the size of the candle. The bulb 5 is devoid of the usual screw base and the lead-in wires 6, 7 are connected directly to conductors 8, 9 respectively. The latter are preferably of such diameter that when twisted together they form a strand about equal in diameter to a candle wick. Conductors 8, 9 serve the double function of carrying the electric current to the bulb and supporting the bulb in an upright position. A wrapper 10—preferably of white tissue paper coated with shellac—is shown in Fig. 10 enveloping the electric bulb and the conductors 49 and 50. The wrapper is twisted to form a point at the tip and is likewise constricted at the lower end to approximately the diameter of the twisted cord comprising wires 8 and 9.

By omitting the usual screw base the weight is considerably reduced, but, what is more important, the illumination extends without obstruction to the lowermost end of the light-emitting element. This improves

ment is obtained by employing the preferred form of lamp, as shown in Figs. 6 and 9, having a seal-off tip at the bottom and lead-in wires entering above the tip. In addition to increasing the degree of illumination down to the junction of the "flame" with the candle body, this construction also assists in simulating the actual shape of a candle flame because the lamp is preferably mounted, as shown, with the tip at the stricture between the light-emitting element and the candle body. Thus, the light-emitting element or "flame" per se, is illuminated down to the stricture at the junction of the "flame" and the candle body, and no part of it is obscured by the candle body. When the top of the candle body is dished, as in Fig. 4, the light shines through the wax at the top and enhances the realistic effect. This is an important feature since it greatly enhances the realistic effect.

Various constructions of candle bodies are illustrated in the sectional views of Figs. 2, 3, 4 and 5.

In the construction of Fig. 2 the candle body consists of a wood core 11 slotted or apertured to provide for the wires 8 and 9 which extend lengthwise therethrough, and a coating 12 of paraffin or tallow or any other suitable material which will give the appearance of a candle. A screw base 13 is attached to the lower end of core 11 and the conductors 8, 9 are connected thereto.

In the construction of Fig. 3, the core of the candle body consists of a paper shell 14 which is coated with paraffin, tallow or the like. A screw base comprising a wooden plug 15 is inserted in the open lower end of the paper shell 14 and cemented in place. A metal shell 16 with a spun thread like that of the ordinary screw base is attached to the plug 15 and the conductor 8 is connected thereto. A center contact pin 17 is driven through the wooden plug 15 and connected to the other conductor 9.

A convenient and novel arrangement for securing an electric candle in the receptacle of a candle stick is also shown in Fig. 3. This consists of an electric socket 18 adapted to receive the screw base of the candle and make electrical connection therewith. The socket 18 is seated in a soft rubber cup-shaped adapter 19 the external diameter of which is slightly greater than the internal diameter of the candle stick receptacle—but being of soft rubber it can be forced into place.

An alternative form of adapter is illustrated in Figs. 7 and 8. Instead of being made of soft rubber, the cup-shaped adapter 21 is made of a less resilient material such as hard fibre. The cylindrical wall of the adapter is saw-slotted at several places as indicated at 22. Preferably the adapter 21 is tapered both externally and internally—the larger diameter, in each base, being at the open end. The larger external diameter

is made slightly greater than the diameter of the mouth of the candle stick receptacle. Thus when the adapter is inserted in the receptacle it contracts and presses against the side of the receptacle and is thereby held firmly in place. A screw socket 23 adapted to receive the screw base of an electric candle is seated in the adapter 21—being held in place by the conducting bolt 24, separator 25 and spacing ring 26.

The electric candles illustrated in Figs. 4 and 5 are designed to simulate partly burned candles—that effect being obtained by recessing the upper end of the candle bodies as shown.

In Fig. 4, the core 27 may be of wood as in the construction of Fig. 2. The surface material 28 may be paraffin or the like. A suitable screw base 29 is provided at the lower end. The light-emitting element 30 is the same as that of Figs. 9 and 10. The structure of Fig. 5 consists of a paper shell 31 coated with paraffin or the like and a convexed end piece 32 which may also be coated with paraffin. A suitable screw base 33 is attached to the lower end.

In the electric candles illustrated in Figs. 1 to 5 inclusive, the light-emitting elements are not readily replaceable and in the event of a bulb burning out it would be necessary, in most cases, to replace the whole candle. Fig. 6 illustrates a construction in which the element is easily removable and can be replaced by a new one when burned out. Only the upper end portion of the candle body is shown. This consists of a paper shell 34 coated on the exterior with paraffin or the like. A socket member comprising a disc 35 apertured to pass the conductor wires 40 is secured to the shell 34 by any convenient means such as a filler of sealing wax poured into the candle body. A tube 36 of insulating material such as porcelain or glass is secured to the disc 35. The longitudinal aperture through tube 36 is designed to permit insertion of a special plug consisting of another tube 37 of insulating material which is surrounded by two metal sleeves 38 and 39 which are attached thereto and to each of which one of the two wires leading to the filament terminals is attached. One of these runs through the center of tube 37 and is soldered to sleeve 39. The other wire is soldered to the upper end of sleeve 38. For the purpose of establishing electrical connections between sleeves 38, 39 and the connecting cord 40, the tube 36 is provided with a pair of eccentric grooves 41, 42. These grooves are eccentric to the extent that each passes through the shell of the tube 36 at one point on the periphery. An arcuate band 43, 44 of spring metal is seated in each groove 41, 42—one end of each band passing through the longitudinal aperture of tube 36 and making contact with one of the sleeves 38, 39.

The two wires making up cord 40 are connected, respectively, to the circular bands 43, 44. The upper inside corners of the two bands 43, 44 are chamfered to facilitate insertion of the lamp plug. With this construction the electric bulb 45 is still supported by the two small wires which supply current to the filament and the wick-like effect is retained. The wrapper 46 may be of tissue paper coated or impregnated with shellac as previously described. The light-emitting element together with its plug may be readily extracted from the socket and replaced with another.

In Figs. 11 and 12, respectively, there are illustrated two alternative forms of envelopes which may be used to enclose the incandescent bulb of the light-emitting envelope in place of the tissue paper wrapper previously described. These envelopes may be made of celluloid or similar translucent material and they are preferably colored so as to give the emitted light a color similar to that of a candle flame. The envelope illustrated in Fig. 11 is made in two parts 47 and 48, like a capsule—the line of division being lateral. With the electric bulb enclosed, the two parts 47 and 48 are cemented together. An opening large enough to pass a small two conductor cord is provided at the small end of part 48.

The envelope illustrated in Fig. 12 differs from that of Fig. 11 in that it is divided longitudinally. By dividing the envelope longitudinally as in Fig. 12, it may be more easily applied to a bulb when the latter is mounted on a candle body.

In the appended claims I have used the word "wax" as a generic expression to cover all such materials as paraffin and tallow as well as all equivalent substances which when used as a surface coating or exterior shell for a candle body will give the desired appearance of a real candle.

What is claimed is:

1. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion having an exterior surface of wax, and a light-emitting element mounted at the tip of said body portion, said light-emitting element comprising an incandescent electric bulb and having a contour closely approximating that of a burning-wick candle flame being narrowly constricted at the point of juncture with the tip of said body portion, the diameter of the constricted juncture being of the order of one-sixteenth inch or less.

2. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion and a light-emitting element mounted at the tip of said body portion, said light-emitting element comprising an incandescent electric bulb and a translucent wrapper en-

veloping said bulb, the contour of said wrapper closely approximating that of a burning-wick candle flame, being narrowly constricted at the point of juncture with the tip of said body portion, the diameter of the constricted juncture being of the order of one-sixteenth inch or less.

3. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion having an exterior surface of wax and a light-emitting element mounted at the tip of said body portion, said light-emitting element comprising an incandescent electric bulb and a wrapper enveloping said bulb, said wrapper consisting of translucent sheet material coated with a translucent adhesive binder and formed to simulate the contour of a burning-wick candle flame with a pointed tip and narrowly constricted base portion at the juncture with the tip of said body portion.

4. As an article of manufacture, an electric lamp simulating a burning wick candle comprising the combination of a candle-like body portion having an exterior surface of wax and a light-emitting element mounted at the tip of said body portion, said light-emitting element comprising an incandescent electric bulb and a wrapper enveloping said bulb, said wrapper consisting of tissue paper coated with a translucent adhesive binder and formed to simulate the contour of a candle flame with a pointed tip and narrowly constricted base portion at the juncture with the tip of said body portion, the diameter of said constricted base portion being of the order of one-sixteenth inch or less.

5. A light-emitting element designed to simulate a burning-wick candle flame comprising an incandescent electric bulb having a filament and lead-in wires extending from said filament to the exterior of said bulb, a pair of small wire conductors connected to said lead-in wires, said conductors functioning to supply electric current to said filament and also to support said bulb in an upright position, a wrapper enveloping said bulb, said wrapper consisting of translucent sheet material coated over its exterior surface with a translucent adhesive binder and formed to simulate the contour of a burning-wick candle flame having a pointed tip and a narrowly constricted diameter at its base.

6. As an article of manufacture, an electric lamp simulating a burning-wick candle comprising the combination of a candle-like body portion, an electric connector enclosed within the tip portion of said candle-like body portion, a light-emitting element comprising an incandescent electric bulb, a pair of conductors connected to said bulb, and a second electric connector attached to said conductors, said second connector being adapted for detachable connection to said first con-

necter, said conductors being adapted to support said light-emitting element in an upright position.

5 7. An electric candle having a body portion formed to simulate a burning-wick candle, said body portion comprising a non-fusible core and a shell of wax-like material, an electrical connector attached to the base end of said body portion, and a light-emitting element mounted at the tip end of said body portion, said light-emitting element comprising a small electric bulb, a pair of wires protruding from the tip end of said body portion, said wires supporting said bulb and forming an electrical connection between said bulb and said connector, a translucent wrapper enveloping said bulb, said wrapper being shaped to simulate the contour of a burning-wick candle flame, said wrapper being coated with a translucent adhesive substance which is effective to modify the light emitted by said bulb so that it has the appearance of a burning-wick candle flame, said light-emitting element being constricted at the point of juncture with said body portion to a diameter of the order of one-sixteenth inch or less.

8. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion, a light-emitting element mounted at one end of said body portion, said light-emitting element comprising an incandescent electric bulb enveloped in a translucent wrapper, the contour of said wrapper closely approximating that of a burning candle flame point-shaped at both ends, to effect which contour said wrapper is pointed at the top and is narrowly constricted at its juncture with said end of the body portion, and lead-in wires entering the bulb above said constriction whereby the illumination of the constriction is increased.

9. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion and a light-emitting element mounted at one end of said body portion, said light-emitting element being formed and colored to simulate in appearance a burning-wick candle flame with a point-shaped tip at the top and a bottom portion constricted at its juncture with said end of the body portion to a diameter approximating that of said tip, said light-emitting element being entirely outside of said body portion whereby said element is luminous and unobscured throughout its entire length including said constricted portion.

10. As an article of manufacture, an electric lamp simulating a burning candle comprising the combination of a candle-like body portion and a light-emitting element mounted at one end of said body portion, said light-emitting element comprising an incandescent electric bulb having a point-shaped tip at the bottom and being completely enveloped by a translucent wrapper formed to simulate the

contour of a burning-wick candle flame with a point-shaped tip at the top and a bottom portion constricted at its juncture with said end of the body portion to a diameter approximating that of said tip at the top, said bulb being entirely outside of said body portion whereby said light-emitting element is luminous and unobscured throughout its entire length including said tip and said constricted portion.

In testimony whereof I affix my signature.
WILLIAM A. BLACK.

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