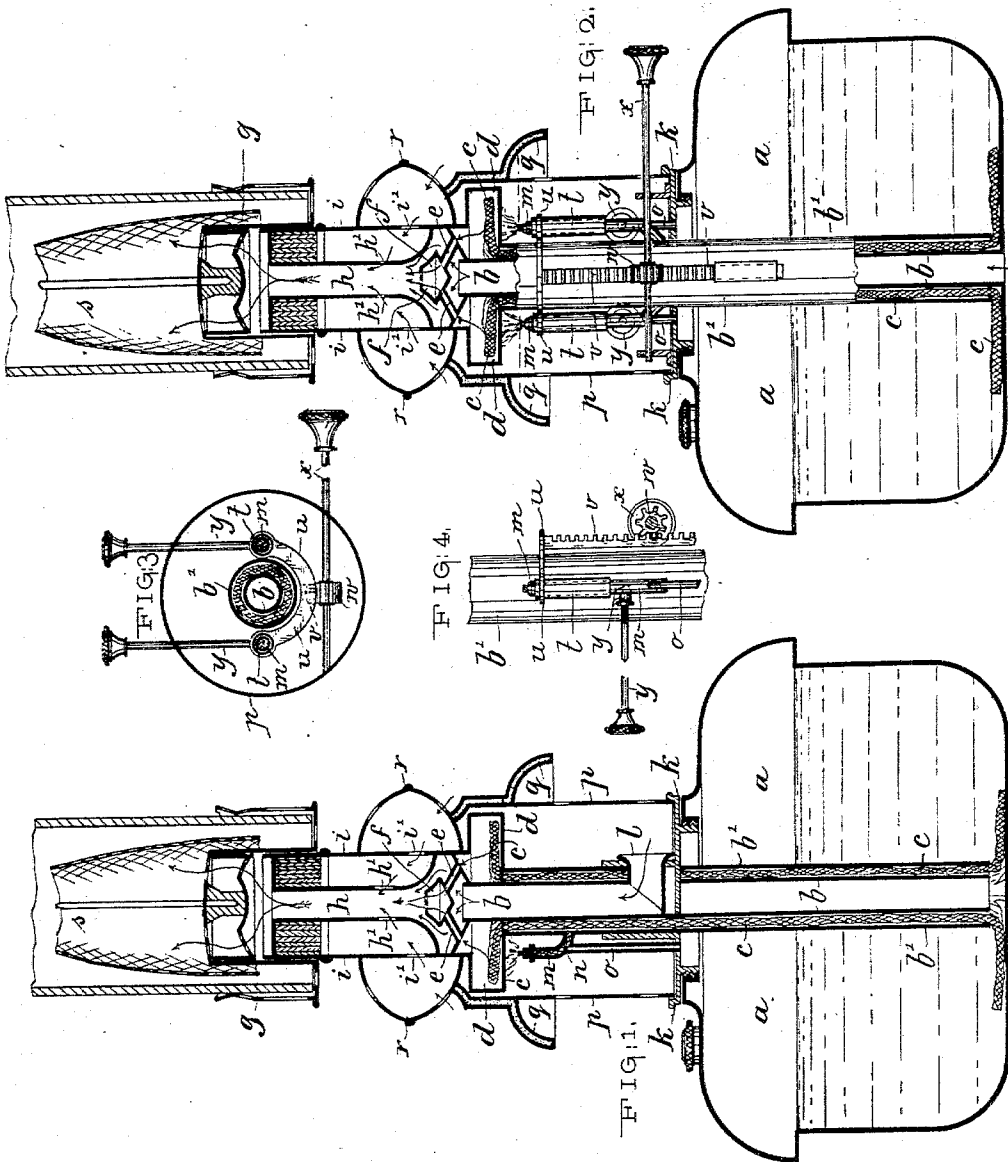


(No Model.)

H. ZERNING.
INCANDESCENT LAMP.

No. 564,952.

Patented July 28, 1896.



WITNESSES:

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HERRMANN ZERNING, OF BERLIN, GERMANY, ASSIGNOR TO THE ACTIEN-GESELLSCHAFT, VORMALS C. H. STOBWASSER & CO., OF SAME PLACE.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 564,952, dated July 28, 1896.

Application filed December 21, 1895. Serial No. 572,937. (No model.) Patented in England September 24, 1895, No. 17,851.

To all whom it may concern:

Be it known that I, HERRMANN ZERNING, a subject of the Emperor of Germany, residing at Berlin, in the German Empire, have invented certain new and useful Improvements in Incandescent Lamps for Fluid Fuel, (for which I have received Letters Patent in England, No. 17,851, dated September 24, 1895,) of which the following is a specification.

The present invention relates to incandescent lamps, which are shown in the accompanying drawings in two practical forms.

Figure 1 is a vertical section through one of the forms; and Figs. 2, 3, and 4 show, respectively, a vertical section, a horizontal section, and a partial elevation of the details belonging to the second form described hereinafter.

The lamps shown in Figs. 1 and 2 differ only in the manner in which the air is admitted to the central tube *b*. In Fig. 1 the air passes into said tube at a point above the vase, as indicated at *l* in said figure, while in Fig. 2 the tube *b* extends to the bottom of the vase and receives air through an opening in same. Another difference consists in providing the small wick-tubes *m* in Fig. 2 with sleeves, and means for elevating and depressing same, so as to regulate or extinguish the flames of the wicks contained in said tubes.

In all other respects the lamps are identical, as will appear from the following description.

Into the vase *a*, holding the liquid fuel, two concentric tubes *b b'* are inserted, holding between them a wick *c*. These tubes end above into the evaporation-chamber *d*, which is connected with a nozzle *f* by means of small pipes *e*. This nozzle *f* is placed immediately above the central hollow space of the tubes *b b'*, being in line with the same and being closed on the top surface by a perforated plate, affording communication with a burner *g* by means of a pipe *h*, having lateral openings *h'*. The pipe *h* is inclosed in a Bunsen burner *i*, having air-holes *i'*. Immediately above the plate *k*, serving to receive in a screw-thread or otherwise the apparatus of evaporation, and being screwed into the top of the vase *a*, the tube *l* is arranged, being connected at right angles to the tube *b*, (see Fig. 1,) so that air can be admitted from below into the central part of the burner. Instead of this tube *b*

an arrangement, as shown in Fig. 2, may be used, the inner tube *b* being open at its lower end and passing clear through the fount *a*. Below the evaporation-chamber *d* several small wick-tubes *m*, containing the wicks *n*, are arranged, branching off from the outer wick-tube *b'*. These small wick-tubes are connected by pipes *o* with the fount *a*. The small burners *m n o* are surrounded by a perforated jacket *p*, carrying above the hood *q* for protection. Also the openings *j'* of the Bunsen burner are covered by the hood or casing *r*. The parts *p*, *q*, and *r* can be insulated by a material which is a bad conductor of heat, such as asbestos, kieselguhr, &c.

The lamp operates in the following manner: The fuel, such as alcohol, benzene, and the like, is drawn up by the wick *c* from the basin or fount *a* into the evaporating-chamber *d* and is evaporated therein, when the heating-flames of the small burners *m* are lighted. These flames are allowed to burn constantly. The vapors developing in the chamber *d* escape from the same through the pipes *e* into the nozzle *f*, and from there under a certain pressure into the central tube *h*. Here the vapors commingle with a considerable quantity of atmospheric air having access not only through the openings *i'* and *h'* of the tubes *i* and *h*, but also from below either through the tube *l* or through the lower opening of the tube *b*, as shown in Fig. 2.

By reason of the double admission of air the vapors are considerably mixed with oxygen, so that they furnish above the opening of the Bunsen burner a flame of very high heating power as soon as lighted, which flame acts upon the incandescent body *s* and produces a high intensity of incandescence, such as has never been obtained in similar lamps heretofore.

It is evident that the wick *c* raises more fuel than can be consumed by the small burners *m*, and therefore the pipes *o* have been arranged, offering the means to lead the excess of fuel back into the font *a*, so that an overflow from the tube *m* is prevented.

The hood *q* and casing *r* have also the object of preventing too much heating of the outer air around the openings *i'* of the Bunsen burner by the heat of the small heating-

flames, for hot air would not so readily enter into the Bunsen burner or would enter into same only in small quantities. Nevertheless the lamp would not be inoperative for this reason because the second central admission of air is provided besides the lateral upper admission of air.

In order to regulate the heating-flames in size and to extinguish the same, each tube *m* is provided with a loose sleeve *t*, sliding thereupon and connected by a curved plate *u*, passing around the wick *b'*. A rack *v* is secured to this plate and is in gear with a pinion *w* on the end of the shaft of the key *x*. By turning this key in one or the other sense the plate *u* and the sleeves *t* are raised or lowered and thus the heating-flames are varied in size. When the sleeves *t* are raised until they touch the bottom of the evaporation-chamber *d*, all air is excluded from the heating-flames, and they are thus extinguished.

In order to regulate the rise of the liquid fuel into the small wicks *n*, each tube *m* is provided with a small set-screw *y*. The wick *n* can be compressed by means of the latter and thus the ascending fuel can be shut off gradually. This also offers means of regulating the heating-flames.

Having thus described my invention, I claim—

1. An incandescent lamp having burners with wicks branching off from the main wick

c and provided with tubes *o*, connected to the fount *a* for leading back any excess of fuel.

2. An incandescent lamp having burners *m* with wicks branching off from the main wick *c* and provided with tubes *o*, connected to the fount *a* for leading back any excess of fuel and having over the heating-flames, hoods or casings *q, r*, composed of bad conductors of heat to keep off the heat from the openings of the Bunsen burner.

3. An incandescent lamp having small heating-burners *m*, provided with sleeves, and a curved plate connecting said sleeves, and means substantially as described, whereby the said plate and sleeves are adapted to operate, for the purpose set forth.

4. An incandescent lamp, having small heating-burners *m* provided with sleeves adapted to be moved therein by means of a rack and a pinion on the shaft of the key and provided with a set-screw *y*, pressing on the wicks *n* in said burners *m* so as to interfere with the passage of the rising fuel, substantially as set forth.

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

HERRMANN ZERNING.

Witnesses:

P. HAUPT,
HEINRICH KRAY.