

# UNITED STATES PATENT OFFICE.

CARL AUER VON WELSBACH, OF VIENNA, AUSTRIA-HUNGARY.

## GAS-INCANDESCENT.

SPECIFICATION forming part of Letters Patent No. 359,524, dated March 15, 1887.

Application filed December 7, 1885. Serial No. 185,027. (No specimens.) Patented in France November 4, 1885, No. 172,064; in Belgium November 4, 1885, No. 70,739; in England November 4, 1885, No. 13,342, December 12, 1885, No. 15,286, and March 13, 1886, No. 3,592; in Italy February 23, 1886, XXXVIII, 310, and October 13, 1886, XL, 415; in Cape of Good Hope March 4, 1886, No. 6/295; in Victoria March 17, 1886, No. 4,472; in Tasmania March 24, 1886, No. 398/9; in South Australia May 3, 1886, No. 678; in New South Wales May 11, 1886, No. 1,829/2; in New Zealand June 11, 1886, No. 1,863; in Queensland June 28, 1886, No. 106; in Finland July 10, 1886, No. 261; in Spain August 10, 1886, No. 9,031/5,858; in Norway August 25, 1886, No. 88, and in India September 2, 1886, No. 40/1,145.

*To all whom it may concern:*

Be it known that I, CARL AUER VON WELSBACH, a subject of the Emperor of Austria, residing at Vienna, in the Empire of Austria-Hungary, have invented new and useful Improvements in Incandescent Burners for Gas, (for which I have obtained patents in France, dated November 4, 1885, No. 172,064; Belgium, dated November 4, 1885, No. 70,739; Italy, dated February 23, 1886, Vol. XXXVIII, No. 310; France, Certificate of Addition, dated April 22, 1886, No. 172,064; Belgium, Certificate of Addition, dated September 9, 1886, No. 74,502; Spain, dated August 10, 1886, No. 9,031/5,858; Italy, Certificate of Addition, dated October 13, 1886, Vol. XL, No. 415; Finland, dated July 10, 1886, No. 261; Norway, dated August 25, 1886, No. 88; Victoria, dated March 17, 1886, No. 4,472; New South Wales, dated May 11, 1886, No. 1,829/2; Tasmania, dated March 24, 1886, No. 398/9; Queensland, dated June 28, 1886, No. 106; New Zealand, dated June 11, 1886, No. 1,863; Cape of Good Hope, dated March 4, 1886, No. 6/205; India, dated September 2, 1886, No. 40/1,145; South Australia, dated May 3, 1886, No. 678; Great Britain, dated November 4, 1885, No. 13,342 and December 12, 1885, No. 15,286, and Great Britain by application for patent dated March 13, 1886, No. 3,592,) of which the following is a specification.

It has heretofore been proposed to use refractory earth and platinum or other wires or filaments made of infusible material—such as magnesia—in the manufacture of devices adapted to be heated to incandescence by the flame from a gas-burner, such devices being now known in the art as “incandescent burners,” for the purpose of increasing the illuminating-power of gas.

My invention has for its object to provide a novel compound for making durable and efficient incandescent burners for gas; and to such end it consists in the combined properties of oxide of lanthanum, oxide of ytrium, and oxide of zirconium, which I have discovered to be very valuable as an illuminant when rendered incandescent by the flame from a gas-

burner. The combined properties of these oxides in a finely-divided condition produce the following results: First, if heated by the flame from any ordinary gas-burner, a highly-intense, almost white, light is obtained; second, the substances are incombustible and infusible, and do not volatilize; third, the substances do not produce scale or ash after burning several hundreds of hours, nor do they evince any decrease of power of emittance, but remain altogether perfect; fourth, the substances can without any change be exposed for any length of time to the influence of atmospheric air so long as the latter is in a condition for inhalation.

The proportions of the oxides may be varied; but I have found the following to give very satisfactory results where all three of the oxides are employed, to wit: oxide of zirconium, sixty per cent.; oxide of lanthanum, twenty per cent.; oxide of ytrium, twenty per cent.

The combined substances may be employed in connection with gas-burners in various ways. For example, the burner may be composed of a tubular skeleton hood, cap, or frame suspended over the flame of the gas-burner, so as to become heated by such flame to incandescence, causing it to give out great and brilliant light. The hood may be made of light net-work fabric or threads—such as cotton impregnated with a solution of the salts of the combined substances named and then exposed to heat, so that the material of the fabric is soon consumed, leaving a skeleton hood, cap, or frame consisting of the incombustible and infusible earthy oxides resulting from the decomposition of the salts employed for impregnating the fabric. This hood, cap, or frame, though light and fragile, will remain effective as an illuminant for hundreds of hours.

I do not here claim the method of making this hood, cap, or frame, as such constitutes the subject-matter of my application for Letters Patent filed June 8, 1886, Serial No. 204,588.

I am aware that it has been proposed to use zirconia in making conductors to form the illuminants of incandescent electric lamps; but

such is not my invention, as it consists in a compound composed of the oxides mentioned to be made into a hood or frame and placed over and rendered incandescent by the heat of the flame  
5 from a gas-burner.

Having thus described my invention, what I claim is—

1. A compound for incandescent burners, consisting of the oxide of lanthanum, oxide of  
10 yetrium, and oxide of zirconium, substantially as described.

2. An incandescent burner for gas, consisting of a skeleton hood or frame composed of the oxide of lanthanum, oxide of yetrium, and  
15 oxide of zirconium, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CARL AUER VON WELSBACH.

Witnesses:

VICTOR TISCHLER,

JOHANN DÖLL.



It is hereby certified that in Letters Patent No. 359,524, granted March 15, 1887, upon the application of Carl Auer von Welsbach, of Vienna, Austria-Hungary, for an improvement in "Gas-Incandescent," errors appear in the printed specification requiring correction, as follows: On page 1, in lines 44 and 68, and on page 2, lines 10 and 15, the word "yetrium" should read *yttrium*; and that the Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 3d day of May, A. D. 1887.

[SEAL.]

D. L. HAWKINS,  
*Acting Secretary of the Interior.*

Countersigned:

BENTON J. HALL,  
*Commissioner of Patents.*