

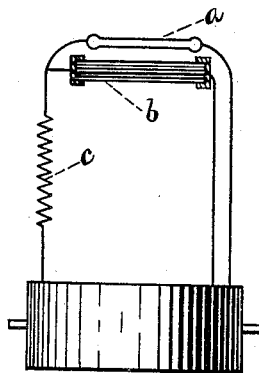
No. 648,518.

Patented May 1, 1900.

K. OCHS.
ELECTRICAL RESISTANCE.

(Application filed Sept. 18, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

KARL OCHS, OF BERLIN, GERMANY.

ELECTRICAL RESISTANCE.

SPECIFICATION forming part of Letters Patent No. 648,518, dated May 1, 1900.

Application filed September 16, 1899. Serial No. 730,667. (No model.)

To all whom it may concern:

Be it known that I, KARL OCHS, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented certain new and

5 useful Improvements in Electrical Resistances, of which the following is a specification.

My invention relates to electrical resistances especially adapted to be used as heating resistances for glowers of second-class conductors in glow-lights.

My invention will be hereinafter pointed out and particularly claimed.

Resistances ordinarily made use of in electrotechnics consist, usually, of metals or their alloys and cannot be employed at a greater heat than red heat on account of their relatively-low melting-point. For certain purposes—for instance, the excitation of the glowing bodies of second-class conductors of glow-lamps—heating-bodies are necessary which can stand a high degree of heat, for the purpose, first, of producing a rapid preparatory heating of the glower, and, secondly, of producing a certain amount of light during the period of excitation or warming up of the glower. Experiments in this direction have resulted in the discovery that certain oxids of metals, especially those of the heavy metals, if treated in the proper way will at ordinary temperatures and without the addition of metallic conductors become relatively-good conductors, so that when the current is sufficient they glow at a white heat, because their of extraordinarily-high vaporizing temperature or melting-point, and when in this condition emit light. Such oxids of metal are, for instance, the following: oxid of iron, oxid of copper, chromium oxid, uranium oxid, oxid of manganese, oxid of nickel, oxid of cobalt, titanium oxid, zinc oxid, tungsten oxid, molybdenum oxid, &c. If a plastic mass is made of these oxids or their mixtures in powdered form with the aid of a binding medium—such as water, a gum solution, &c.—and this mass is formed into little rods or tubes, these bodies have the status of electric non-conductors at a usual temperature. However, they become good conductors if they are glowed, by which process they strongly slag. It is well to add to the plastic mass in the beginning strongly-slugging materials,

such as porcelain earth, magnesia, &c. Such strongly-slugged little rods or tubes are provided at their ends with conductors of difficultly-melting metals, such as platinum or nickel. In this form they can be used as resistances or as light-giving heating-bodies, but in the latter case must be provided with an initial resistance (balancing resistance) in series therewith, because at a high temperature they have a negative temperature coefficient and it is necessary to compensate for the change of resistance.

In the accompanying drawing I have shown a structure in which my invention is embodied.

In the drawing, *a* is the illuminating-body, *b* the heating-body, and *c* the initial resistance, which is shown as common to both the illuminating and heating bodies.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An electric resistance and heating conductive body adapted to act as a heating resistance for a glow-lamp with a second-class-conductor illuminating-body, the said resistance consisting of metal oxid or oxids formed into a solid mass by glowing and slagging.

2. Electric resistance and heating conductive bodies consisting of an oxid or oxids of one or more of the heavy metals mingled with strongly-slugging non-conducting material and formed into a solid mass by glowing and slagging.

3. An electric resistance heat and light giving conductive body composed of glowed and slagged metal oxid or oxids, formed into a mass combined with an initial or balancing resistance for compensating the negative temperature coefficient of the heat and light giving body.

4. A lamp structure comprising the combination of a glower composed of a second-class conducting-body and a heating resistance in circuit therewith composed of a glowed and slagged oxid body which, when traversed by a current of electricity, will emit heat and light.

5. Electric conductive resistance and heating bodies for providing the initial heating in glow-lamps with second-class conductors, the

said resistances being composed of slagged rods of oxid provided with metallic connection-pieces.

6. Electric conductive resistance bodies for
5 providing a heating resistance for conductors of the second-class, consisting of an oxid body having a negative temperature coeffi-

cient, and a balancing resistance in circuit therewith.

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Witnesses:

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