

UNITED STATES PATENT OFFICE.

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MANTLE OR HOOD FOR INCANDESCENT GAS-LAMPS.

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To all whom it may concern:

Be it known that I, GERRIT VAN DETH, a subject of the Queen of Holland, residing at the city of New York, county and State of New York, have invented a certain new and useful Improvement in Mantles or Hoods for Incandescent Gas-Lamps, which is fully set forth in the following specification.

My invention relates to devices which are generally known as "hoods," "mantles," or "gratings," which are adapted for use as illuminating devices by bringing to a state of incandescence when submitted to the flame of gas produced by a suitable gas-burner, such, for instance, as one of the well-known Bunsen type.

My invention will be fully understood by referring to the following specification, the essentially novel features being particularly pointed out in the claims at the end thereof.

The illuminating property of several species of refractory earths or infusible materials when heated to incandescence is well known, and this principle has been made use of in the construction of several types of incandescent hoods or burners. My present invention is based upon the same principle. The incandescent hood or mantle consists of a skeleton frame of the oxids, of well-known form, impregnated with certain refractory earths or infusible materials and ammonium nitrate, as hereinafter mentioned. I impregnate a fabric of cotton with the said materials by immersing it in a solution of the nitrates of such materials, then drying, and then consuming or burning out the combustible material by submitting to heat of sufficiently high degree to accomplish this result.

My novel compound for the impregnation of a fabric or hood consists of the following materials, viz: first, thorium nitrate; second, cerium nitrate; third, ammonium nitrate; fourth, lithium nitrate; fifth, zirconium nitrate; sixth, yttrium nitrate. The proportions of these several elements employed in making the mixture are as follows, the said proportions, as here given, being in weight: first, thorium nitrate, ninety-eight parts; second, cerium nitrate, 0.74 parts; third, ammonium nitrate, 0.315 parts; fourth, lithium nitrate, 0.315 parts; fifth, zirconium nitrate, 0.315 parts; sixth, yttrium nitrate, 0.315 parts.

The solution for use is obtained by dissolving these several salts in any liquid or liquids known as adapted and suitable for this purpose, the solution being preferably saturated.

The base for the incandescent hood or mantle is a fabric, cotton, for instance, preferably in the form of a seamless cylinder, though this specific form is not absolutely essential. This fabric, woven or otherwise produced in the form desired, is dipped into or submitted to a bath in the solution mentioned above and is there retained until it becomes fully saturated with the said solution one minute. The saturated fabric is then removed from the solution and submitted to a squeezing or pressing force, which may be obtained, for instance, by passing the fabric between compression-rollers of rubber or any other suitable material. The fabric after submission to this step in the process is nearly dry and is then completely dried by submission to heat of low degree, but sufficiently high to evaporate substantially all the moisture.

When substantially dry after the last-mentioned step in the process, that portion of the fabric which in use will be the upper part of the hood or mantle is doubled upon itself, and an asbestos thread is stitched through this doubled part and the diameter of the latter then reduced by drawing the ends of the asbestos thread together and then tying them. The asbestos thread is then drawn diametrically through this reduced part of the hood or mantle and fastened in any suitable way, and the hood or mantle is then submitted to the action of a flame on any suitable burner—Bunsen, for instance—whereby the combustible matter contained therein is entirely consumed or burned out. When thus heated to burn out or consume the combustible material, the nitrates of the thorium, cerium, lithium, zirconium, and yttrium with which the fabric is impregnated change to oxids, and in this form are non-combustible and remain so, retaining the shape of the article thus produced, which may be described as a "skeleton frame" of an incandescent illuminant, which if carefully handled will remain effective in practical use upon a suitable gas-burner for at least one thousand hours.

The gas lamp or burner with which this in-

candescing hood or mantle may be used is of any construction suitable for the purpose, such, for instance, as a burner of the Bunsen type; but as the construction of the gas-
 5 burner does not constitute a part of the present invention a description thereof is not here necessary.

In the formula stated above specific proportions of the several elements of the com-
 10 position are given which I believe will produce the best result; but I do not wish to be understood as limiting my invention to the exact proportions named in specific minute details, for these proportions may be varied
 15 slightly without losing the main features of the invention.

I have discovered that by combining the salt of a nitrate, such as lithium nitrate, with other well-known incandescing materials,
 20 such as those hereinbefore described, there results, when a hood has been treated in the manner described and subjected to a heat sufficient to render it incandescent, oxid of lithium, and that such oxid of lithium when
 25 combined with the other resultant oxids causes the hood to give a very much more efficient light than results from the combination of any of the before-mentioned elements when combined without a lithium salt.

It is my belief that this result is attrib-
 30 utable to the fusion of the lithium oxid, whereby the other oxids are caused by their combined action with the fused oxid to give increased incandescing effects. Whether this
 35 theory be true or not I am not positive, but at the present time it appears to be the most plausible theory upon which to base the increased efficiency which has been found by me to result from such a combination. I
 40 have made a number of comparative tests with well-known forms of incandescing hoods, embracing nitrates of the materials hereinbefore mentioned, and other hoods embracing the same materials combined with lithium

nitrate, and I have found that the combina-
 4 tion of elements involving lithium nitrate produces a marked improvement in the illuminating capacity of a hood.

Having thus described my invention, what I claim to be new, and desire to secure by Let-
 ters Patent, is—

1. A composition for incandescing hoods or mantles, the same consisting of thorium nitrate, cerium nitrate, ammonium nitrate, lithium nitrate, zirconium nitrate, and yttrium nitrate, in proportions substantially as described.

2. A compound for an incandescent gas-light mantle, including a nitrate of lithium adapted to be converted into an oxid by heat, substantially as described.

3. As an article of manufacture an incandescent mantle impregnated throughout its body with a lithium salt, substantially as described.

4. As an article of manufacture an incandescent mantle impregnated throughout its body with an oxid or hydroxid of lithium, in combination with one or more refractory earths.

5. As an article of manufacture a burned mantle, containing an oxid or hydroxid of lithium as a compound part among certain refractory earths, substantially as described.

6. The described process of preparing an incandescent hood or mantle which consists in impregnating the hood with nitrates of thorium, cerium, ammonium, lithium, zirconium and yttrium in substantially the proportions named, then subjecting the hood to a low degree of heat sufficient to evaporate the moisture and finally subjecting it to the action of a flame until the combustible matter is entirely consumed or burned out.

GERRIT VAN DETIL.

Witnesses:

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 T. C. CRAWFORD.