

No. 638,837.

Patented Dec. 12, 1899.

R. A. FESSENDEN.
PENCIL FOR INCANDESCENT LAMPS.

(Application filed Aug. 25, 1899.)

(No Model.)

FIG. 1.

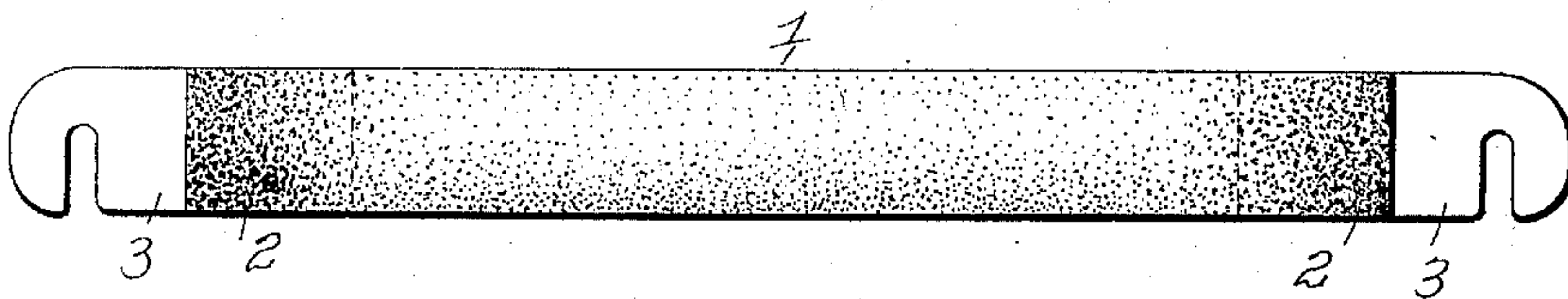


FIG. 2.

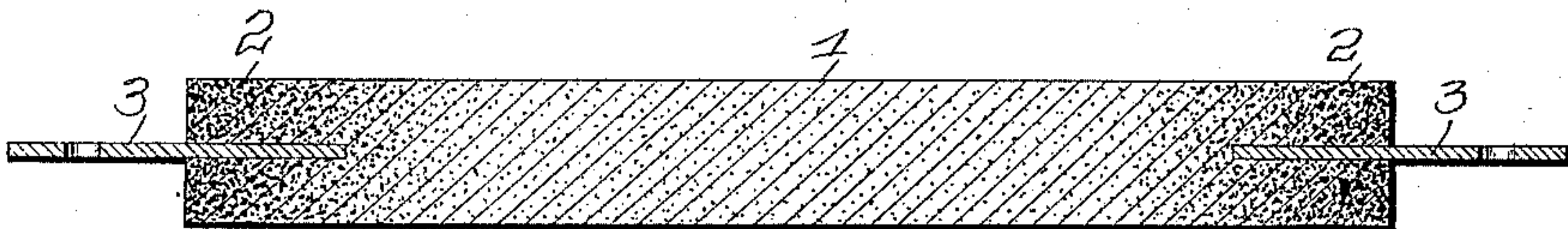


FIG. 3.

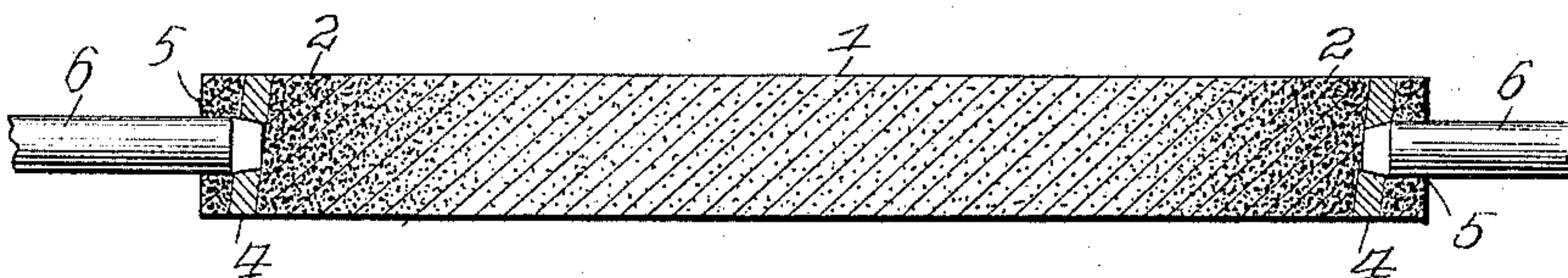
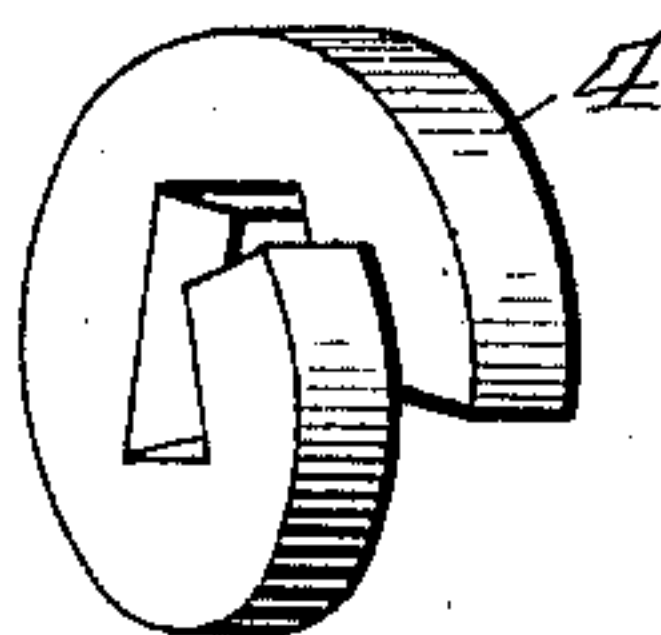


FIG. 4.



WITNESSES:

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REGINALD A. FESSENDEN, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GRANT MCCARGO, OF PITTSBURG, PENNSYLVANIA.

PENCIL FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 638,837, dated December 12, 1899.

Application filed August 25, 1899. Serial No. 728,419. (No model.)

To all whom it may concern:

Be it known that I, REGINALD A. FESSENDEN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Pencils for Incandescent Lamps, of which improvements the following is a specification.

The invention described herein relates to certain improvements in pencils for that class or kind of electric lamps in which is employed a pencil formed of a material non-conducting at low temperatures, but conductive when heated, the conductivity increasing with increase in temperature. As these pencils must be heated to a high temperature in order to obtain sufficient light, it has been necessary to form the terminals of a material, such as platinum, indestructible except at excessively high temperatures. The great expense of that character of terminals has nearly prohibited the use of this form of lamp.

The object of the present invention is to provide for the use of terminals which need not be non-oxidizable at high temperature.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is an elevation of my improved pencil. Fig. 2 is a sectional view of the same. Fig. 3 is a sectional view of a modified form of terminal, and Fig. 4 is a detail view of the terminal shown in Fig. 3.

In the practice of my invention the body or central portion 1 of the pencil is formed of a material—as, for example, thoria, magnesia, or kaolin—which at normal temperatures will not conduct electric currents, but when heated becomes conductive, the conductivity increasing with increase in temperature. The ends 2 of the pencil are formed of a composition which becomes a conductor at a lower temperature than the other material—as, for example, a mixture of thoria and magnesium chlorid or magnesia and magnesium chlorid or a mixture of thoria and magnesia. It is preferred to so prepare the end portions that the quantity of the material which becomes a conductor at lower temperatures shall increase gradually from the point of junction

with the body portion and that there shall be an excess of such material at the ends of the portions 2. In such a pencil its conductivity will increase gradually from its body portion to the ends. While it is preferred to graduate the material composing the portions 2 in the manner stated, these portions may be made of uniform composition throughout. A mixture consisting of ten per cent. of chlorid of magnesium and ninety per cent. of magnesia for the portions 2, while the body portion 1 is formed of magnesia, gives very good results; but I do not limit myself to these proportions nor to the materials stated, as I have obtained very good results in using other materials having the characteristics stated. By thus increasing the conductivity at lower temperatures of the ends of the pencil these portions will not become so highly heated, and terminals formed of nickel or an alloy of nickel and iron or copper or other materials which are oxidizable at high temperatures may be employed, as the ends 2 of the pencil will not, by reason of their conductivity at the lower temperatures, be heated sufficiently high to destroy the metal terminals.

The metal terminals may be made in the form of flat strips 3, having one end embedded in the end portions 2 of the pencil. At least a portion of these strips should be made of a width equal to the width of the end portions or otherwise so constructed that an edge of the strip will be flush with the surface of the pencil in order that the terminals may be connected by a strip or film of conducting material laid along the surface of the pencil, as described in application, Serial No. 726,395, filed August 7, 1899. As the path or film of conducting material is preferably formed by rubbing a block of such material along the pencil, the block would not come in contact with the edges of the metal terminals if they are materially within the surface of the pencil, and if such edges should project materially beyond the surface of the pencil the block of conducting material would be raised from the surface of the pencil when passing over the projecting edges of the terminals.

In lieu of the construction shown in Figs. 1 and 2 the metal terminals may be made in the form of a split washer or ring 4, which is

bent to form a spiral, as shown in Figs. 3 and 4. The ring or washer is made of an external diameter equal to the external diameter of the pencil, so that its edge will be exposed and flush with the surface of the pencil. The terminals may be connected in any suitable way to the wires of the circuit; but in using the rings or washers it is preferred to form axial holes or sockets 5 in the end portions 2 for the reception of pins 6, said holes extending beyond the rings or washers. The hole or opening through the washer is made of such a size or shape that the ends of the pins will bear against and have electric contact with the washer.

I claim herein as my invention—

1. A pencil for incandescent lamps having its body portion formed of a material which will be conductive only when heated, and its end portions formed of a material which becomes conductive at a lower temperature than the body portion, substantially as set forth.
2. A pencil for incandescent lamps having its body portion formed of thoria, and its end portions of a mixture of thoria and chlorid of magnesium, substantially as set forth.
3. A pencil for incandescent lamps having its body portion formed of a material conductive only when heated, and its ends formed of a material conductive at a lower temperature than the body portion, the conductivity

of the end portions gradually increasing from the junction with the body portion outward, substantially as set forth.

4. A pencil for incandescent lamps formed of a material conductive only when heated and provided with metal terminals embedded in the pencil, a portion of the terminals being exposed and flush with the surface of the pencil, substantially as set forth.

5. A pencil for incandescent lamps having its body portion formed of a material conductive only when heated and its end portions formed of a material conductive at a lower temperature than the body portion, and provided with terminals formed of a metal oxidizable at high temperature, substantially as set forth.

6. A pencil for incandescent lamps formed of a material conductive only when heated, in combination with spirally-shaped disks formed of metal and embedded in the pencil, the edges of the disk being exposed and flush with the surface of the pencil, substantially as set forth.

In testimony whereof I have hereunto set my hand.

REGINALD A. FESSENDEN.

Witnesses:

DARWIN S. WOLCOTT,
M. S. MURPHY.