

No. 884,137.

PATENTED APR. 7, 1908.

R. M. DIXON.
MANTLE BURNER.

APPLICATION FILED SEPT. 20, 1906.

Fig. 1.

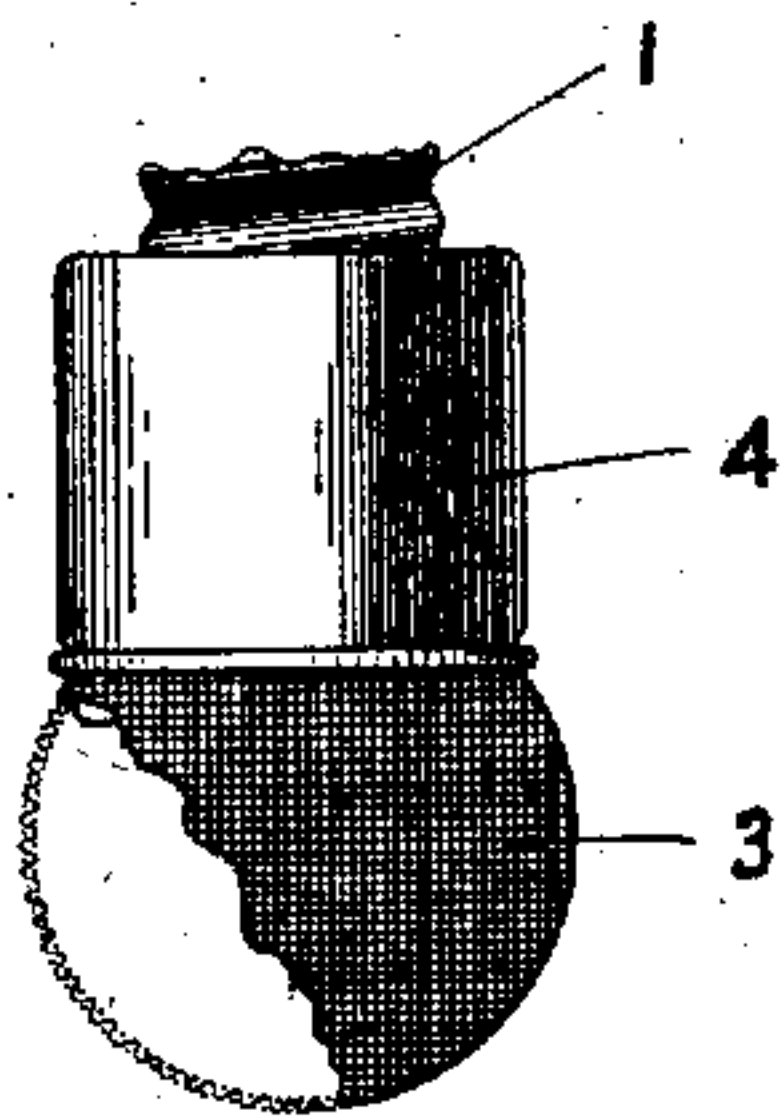


Fig. 2.

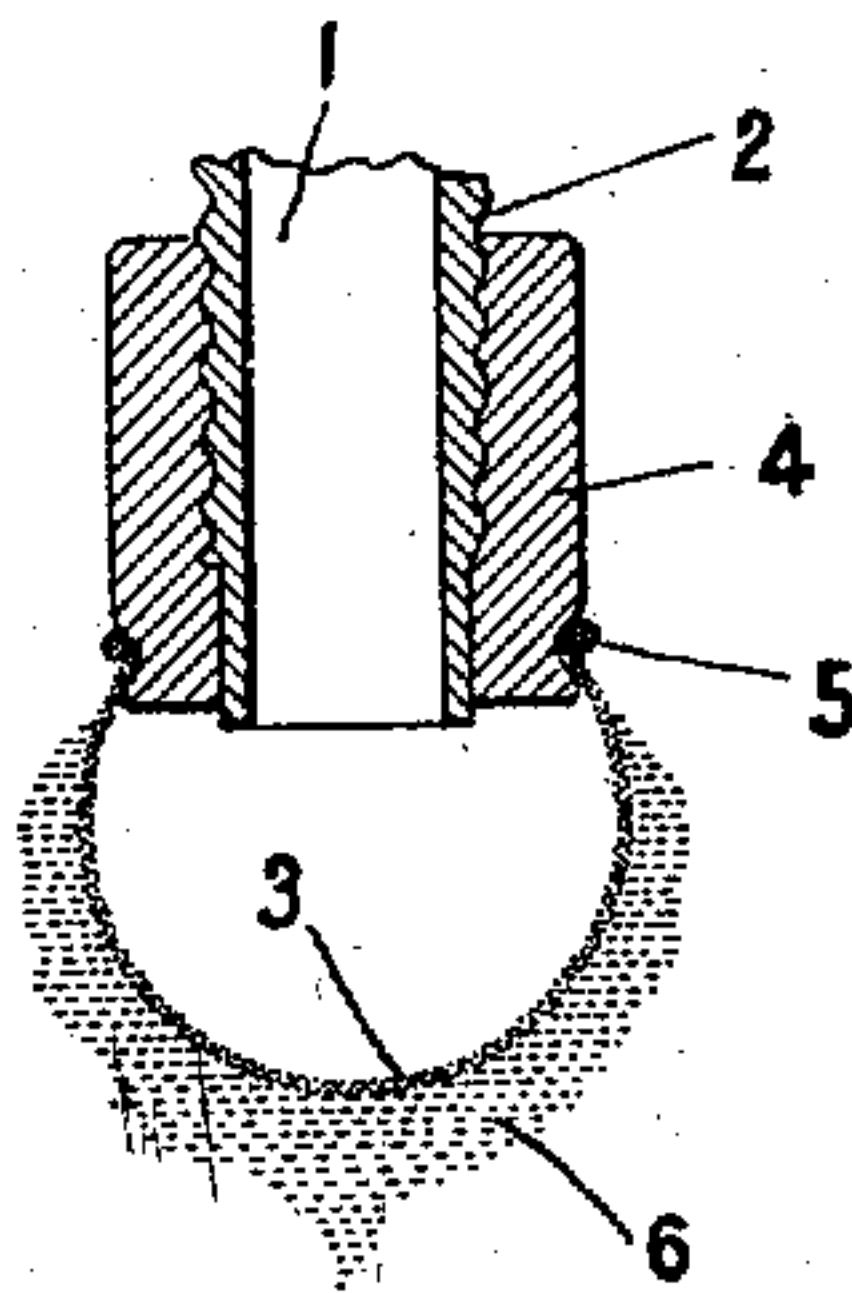
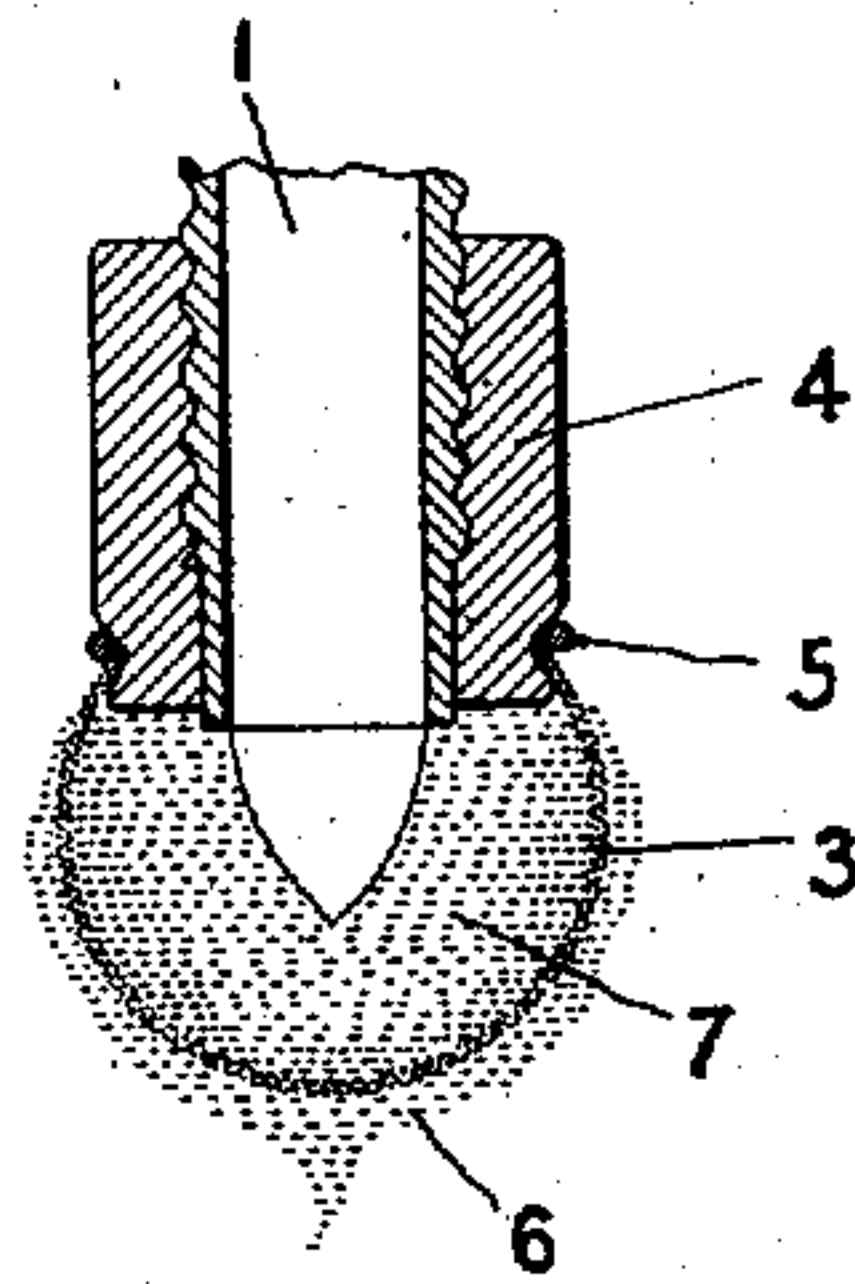


Fig. 3.



WITNESSES:

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ROBERT M. DIXON, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE SAFETY CAR HEATING & LIGHTING COMPANY, A CORPORATION OF NEW JERSEY.

MANTLE-BURNER.

No. 884,137.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed September 20, 1906. Serial No. 335,502.

To all whom it may concern:

Be it known that I, ROBERT M. DIXON, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Mantle-Burners, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to an improvement in incandescent mantles.

Broadly speaking, it has for its object to provide a structure adapted to be ignited without excessive shock.

15 Incandescent mantles as at present constructed are of an exceedingly fragile nature, and are incapable of withstanding rough usage. Such mantles are commonly employed in connection with what is known as
20 a Bunsen burner, which delivers a mixed gas composed of oxygen and an oxidizable gas. This mixture is, as is well known, of a highly explosive nature, and while it is capable of quietly burning after its initial ignition, such
25 ignition is invariably accompanied by a sharp explosion, the force and intensity of which is largely proportional to the volume of the gas exploding. In mantle lamps as hitherto constructed it has been customary
30 to ignite the gas initially by first turning on the burner and allowing gas to escape until a zone of considerable volume is formed around and within the mantle, and then to bring a flame or other igniting means toward
35 said zone to cause an ignition of the gas, which thereupon will sharply explode simultaneously throughout its full extent. Because of the volume of the explosive and because of the fact that the mantle is centered
40 within the same, such mantle is subjected to excessive stresses and strains, and its life is accordingly very materially diminished.

This invention proposes to largely obviate the aforesaid deteriorating defects by reducing the force and intensity of the explosion
45 and by causing it to take place fragmentally and through an appreciable interval of time, instead of taking place simultaneously.

The invention accordingly consists in the
50 features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following
55 claims.

In the accompanying drawings, wherein I have shown one of the various possible embodiments of my invention, Figure 1 is a side elevation of a burner tip and associated mantle constructed in accordance with this invention, parts being broken away to more
60 clearly show certain features of the same. Fig. 2 is a vertical section taken through Fig. 1, showing the operation of this invention and illustrating the initial step in the manner
65 of lighting the mantle preparatory to use. Fig. 3 is a like view but showing the final stages in the ignition of the gas which maintains the mantle in an incandescent condition.
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Similar reference characters refer to similar parts through the several views of the drawing.

In carrying out this invention, I have shown the same as applied to what is known
75 as an inverted burner, though it will be apparent that it may have application to other uses within the scope of this invention. In such embodiment 1 denotes a burner tube having adjacent the end thereof threads or
80 other means 2 for securing the mantle to said burner tube end. The mantle, designated by 3, may be mounted upon a spool 4 which may be of asbestos or other suitable material and which may be closely attached thereto
85 by means of a binding cord or the like 5, which countersinks within a suitable annular groove within said spool. Preferably, the said spool will have a close fit upon the burner tube end and the parts will be so arranged that the escaping gas will find exit
90 through the pores of the mantle only.

Instead of constructing the mantle so as to provide pores of considerable size, as has invariably been done heretofore, I construct
95 my mantle in such a manner that it will have a very fine mesh, and preferably also will provide threads of considerable thickness. The object of this feature of my invention is to have the pores of the mantle of such minuteness that the mantle may, at least temporarily, serve as a screen in preventing the combustion of the exterior gas from simultaneously causing an ignition of the gases in the interior of the mantle, as by the progression of the combustion through the pores
100 of the mantle. This will be understood by referring to Fig. 2, which shows the condition of the combustion after the initial ignition. The interior of the mantle is filled with un-
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burning gas, which is, however, continuously flowing through the meshes of the mantle. The mantle is exteriorly enveloped by a mass of burning gas, indicated by 6, and this gas is
 5 of course continuously replenished by unburned gas flowing from the interior of the mantle through the meshes of the same.

In practice it has been found that the outer developing zone of gases will burn for
 10 quite an appreciable time before the second step of the igniting operation takes place. That is to say, such enveloping zone of gases will burn until the mantle becomes heated or incandescent through the heat engendered by
 15 such exterior combustion, and then the highly heated mantle will in turn set fire to the gases in the interior thereof, or at least be in such condition as will permit of such ignition, and the condition shown by Fig. 3 will now
 20 be reached. In this condition there is an incandescing mass of gas 7 within the interior of the mantle, and the latter is also surrounded by the aforesaid exterior zone 6. It will accordingly be seen that the objects and ends
 25 of this invention are attained in a very simple and highly satisfactory manner. The operation of igniting a mantle constructed in accordance with this invention does not have the disrupting effect upon the mantle which
 30 is common to the heretofore employed forms. In operation, the gas is first turned on until it has filled the mantle and has enveloped the same and then the igniter is applied. As a
 35 result of this action an inappreciable explosion of the enveloping gases, unaccompanied by ignition of the interior gases, takes place. This explosion is so gentle that it is more in the nature of a puff, and this is probably due to the fact that the exploding gases are en-
 40 tirely unconfined. After the enveloping gases have burned momentarily the mantle becomes incandescent and sets fire to the inner gases, which ignite also, in the manner of a gentle puff, and without any undue shock
 45 or violence. The so-called explosion is thus divided into a number of distinct parts, and is without deleterious effect upon the mantle.

As many changes could be made in the above construction and many apparently
 50 widely different embodiments of my invention could be made without departing from

the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting
 55 sense.

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

1. In a device of the class described, a
 60 mantle consisting of woven strands of readily incandescing material, the mesh of said strands throughout being fine and adapted to constitute a barrier to the progression
 65 through said mantle of the combustion of gases exteriorly enveloping said mantle whereby an ignition of the interior gases can take place only by contact with the mantle
 preliminarily heated to incandescence by the
 70 initial combustion of the exterior gases.

2. In a device of the class described, in
 combination, a burner tube and a mantle snugly mounted on the end thereof and arranged to receive in its interior gas delivered
 75 by said burner tube, said mantle being sufficiently pervious to allow such gas to freely flow therethrough and burn the exterior of
 said mantle, but unadapted throughout to permit the ignition of the interior gas by the
 80 progressive combustion of said exterior burning gas when said mantle is at a normal temperature.

3. In a device of the class described, in
 combination, a burner tube and a mantle closely interfitting with and carried by the
 85 end of said tube whereby combustion may not be directly communicated to the interior from the exterior gases and arranged to receive in its interior gas delivered by said
 tube, said mantle being composed of woven
 90 strands of readily incandescing material and having a mesh adapted to allow outflow of gas therethrough but unadapted throughout to allow externally burning gas to directly
 95 ignite the gas within said mantle.

In testimony whereof I affix my signature, in the presence of two witnesses.

ROBERT M. DIXON.

Witnesses:

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 ELMER E. ALLBU.