W. G. HOUSKEEPER.

ELECTRICAL TERMINAL DEVICE.

APPLICATION FILED NOV. 3, 1909.

1,099,091. Patented June 2, 1914.

Fig. 1.

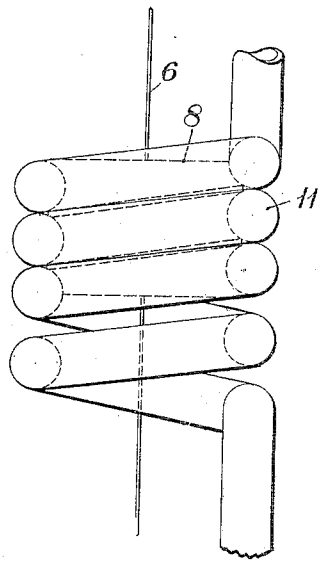


Fig. 2.

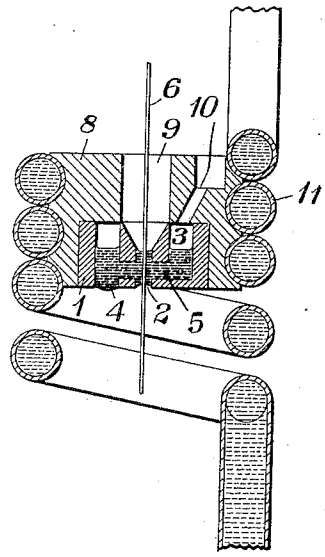
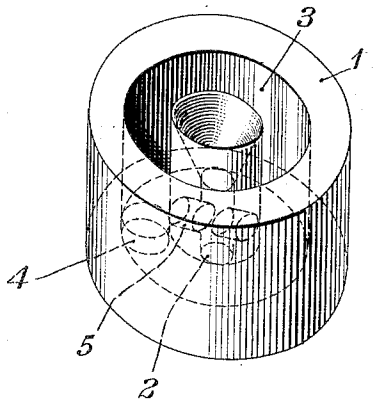


Fig. 3.



WITNESSES:

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ELECTRICAL TERMINAL DEVICE.

1,099,091. Specification of Letters Patent. Patented June 2, 1914.

Application filed November 2, 1909. Serial No. 526,064.

To all whom it may concern:

Be it known that I, WILLIAM G. HOUSKEEPER, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Electrical Terminal Devices, of which the following is a specification.

My invention relates to electrical terminal devices and particularly to such devices as are adapted to engage and to conduct current to or from a continuously moving conductor, such as an incandescent lamp filament which is in course of preparation.

The object of my invention is to provide a terminal device which will be unusually effective for the purpose indicated, and which will require but a minimum degree of preparation and attendance when in use.

Figure 1 of the accompanying drawing is a side view of a device constructed in accordance with the present invention. Fig. 2 is a vertical sectional view of the device of Fig. 1, and Fig. 3 is a perspective view of one of the parts of the terminal device.

The device comprises a cylindrical block 1 having a central aperture 2, the upper end of which is cone shaped or countersunk, an annular recess 3 surrounding the central aperture 2, an aperture 4 larger than the central aperture 2 at the bottom of the annular recess 3, and a cross passage 5 connecting the annular recess 3 with the central aperture 2. The block 1 is preferably amalgamated, and to that end is composed of copper or other material with which mercury may be readily amalgamated, or for which it possesses a high degree of capillary attraction, and which does not readily dissolve in mercury or render it impure, and the annular recess, the apertures, and the cross passage are filled, or partially filled, with mercury, substantially as shown. As the block is amalgamated, the mercury will be held by surface tension in the apertures and passages above mentioned. The conductor 6, with which the device is adapted to make electrical contact, passes through the central aperture 2 and the mercury contained therein.

For the best operation of the device, it has been found advantageous to have the upper and lower surfaces of the body of mercury through which the conductor passes of concave form, which forms are automatically obtained, in the present instance, by reason of the difference in diameters of the apertures 2 and 4. The pressures per unit of area that oppose and tend to overcome the surface tension of the mercury that spans the apertures 2 and 4 are the same, but the area of the aperture 4 being greater than that of aperture 2, a greater pressure will be exerted in opposition to the surface tension of the mercury across the aperture 4 than is exerted in opposition to the surface tension across the aperture 2. The result is that when the mercury rises in the annular recess 3 and in the aperture 2 above a certain height, the pressure exerted thereby is more than sufficient to overcome the surface tension of the mercury across the aperture 4, and the mercury will exude therefrom until the pressure is reduced to such a degree that the surface tension of the mercury may again sustain its weight. The surface of the mercury across the aperture 4 will therefore be convex when the block contains the maximum amount of mercury which the surface tension will sustain, while both the upper and lower surfaces of the mercury in the aperture 2 will be concave in form. Thus the surfaces of the mercury in the aperture 2 will be caused to automatically assume the most advantageous forms by simply filling the annular recess 3 with mercury until it begins to exude from the aperture 4. The recess 3 also serves as a reservoir for mercury and continually supplies the same to the aperture 2 and maintains the recess 2 filled, thereby compensating for any losses which may occur during the use of the device and keeping the surfaces of the mercury of the proper form.

In the use of the device, the amount of heat generated may be very high or excessive, and, in order to convey the same away and maintain the terminal at a reasonably low temperature, the block 1 is embedded in the lower part of another block 8, having a central aperture 9 corresponding to and communicating with the aperture 2, and another aperture 10 that connects the annular recess 3 and provides a passage for admitting mercury to the said annular recess. The outer circumferential face of the block 8 is provided with a helical groove in which is sealed a coil of tubing 11 through which water flows for cooling the terminal.

It will, of course, be understood that the structural details of the device may be modified considerably without departing from the spirit or scope of the invention, and that, if desired, the device may be employed for the purpose of conducting current to and from other conductors than incandescent lamp filaments.

I claim as my invention:

1. In an electrical terminal device, the combination with a block provided with two apertures differing in diameter, and a cross passage connecting the apertures, of mercury contained within the apertures and cross path.

2. In an electrical terminal device, the combination with an amalgamated body having two apertures differing in diameter and a cross passage connecting the apertures, of mercury contained within the apertures and cross passage.

3. In an electrical terminal device, the combination with a block having a central aperture, an annular recess surrounding the same, an aperture larger than the said central aperture at the bottom of the recess, and a cross passage connecting the annular recess to the central aperture, of mercury contained within the said apertures, recesses and passage.

4. In an electrical terminal device, the combination with a block having a central aperture, an annular recess surrounding the same, an aperture larger than the said central aperture at the bottom of the recess, and a cross passage connecting the annular recess to the central aperture, of mercury contained within the said apertures, recess and passage, and another block engaging the aforesaid block and provided with apertures communicating with the central aperture and recesses therein.

5. In an electrical terminal device, the combination with a block having a central aperture, an annular recess surrounding the same, an aperture larger than the said central aperture at the bottom of the recess, and a cross passage connecting the annular recess to the central aperture, of mercury contained within said apertures, recess and passage, and another block engaging the aforesaid block and provided with apertures connecting with the central aperture and recess therein, and cooling coils engaging the latter block.

6. In an electrical terminal device, the combination with a body provided with apertures differing in diameter, a cross passage connecting the apertures, and a reservoir communicating with the apertures and passage, of mercury contained within the apertures, cross passage and reservoir.

7. A device of the character described comprising an apertured body having a reservoir communicating with the aperture, and mercury contained within the reservoir and suspended across the aperture by capillary attraction of the aperture walls.

8. A device of the character described comprising an apertured body having a reservoir communicating with the aperture, and a fluid conductor contained within the reservoir and suspended across the aperture by capillary attraction of the aperture walls.

9. A device of the character described comprising an apertured body having a reservoir communicating with the aperture, and a fluid conductor contained within the reservoir and suspended across the aperture, the walls of the aperture having a positive degree of capillary attraction for the fluid conductor.

10. A device of the character described comprising an apertured body having a reservoir communicating with the aperture, and mercury contained within the reservoir and suspended across the aperture, the walls of the said aperture being amalgamated.

11. A device of the character described comprising a member having separated parts and a reservoir communicating with the space between the said parts, and a liquid conductor contained within the reservoir and suspended between the said parts by capillary attraction.

In testimony whereof, I have hereunto subscribed my name this thirteenth day of October, 1909.

WILLIAM G. HOUSKEEPER.

Witnesses:

GEORGE P. SCHOLL,

R. C. KARCHNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."