

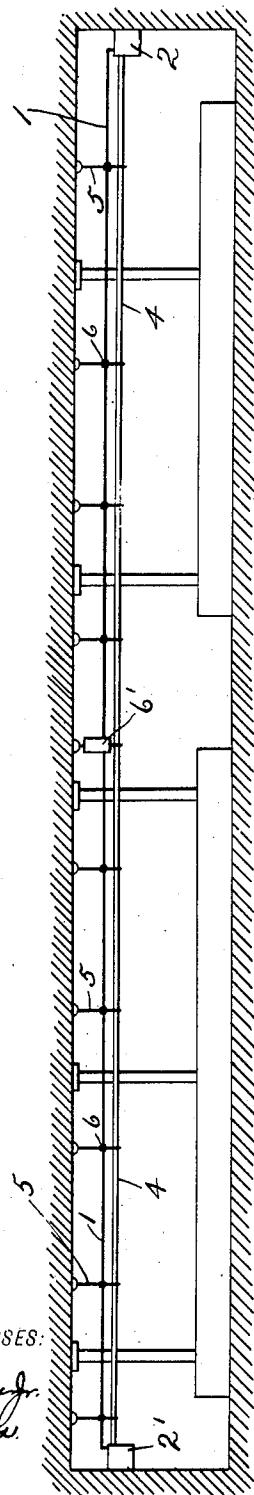
D. MoF. MOORE,
Fixture for Vacuum Tube Lamps.
APPLICATION FILED FEB. 26, 1907.

1,028,092.

Patented May 28, 1912.

3 SHEETS-SHEET 1.

Fig. 1.



WITNESSES:

A. H. Fischer,
Lillian Blod.

Fig. 2.

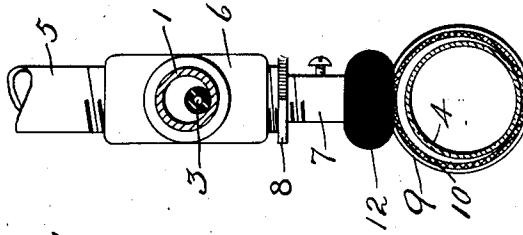
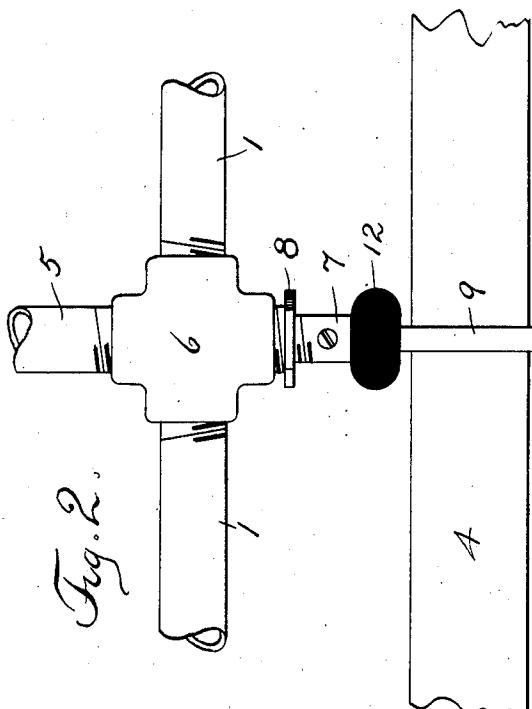


Fig. 3.

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3 SHEETS-SHEET 2.

Fig. 4.

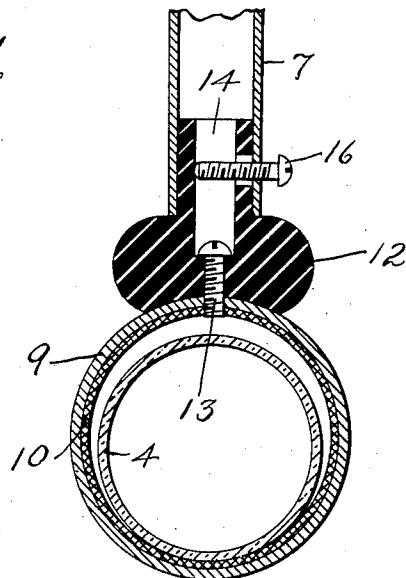
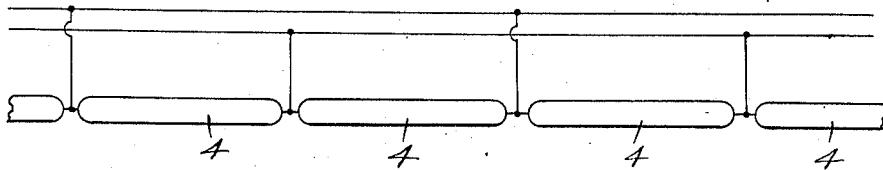


Fig. 5.



WITNESSES:

C. H. Fischner, Jr.
Lillian Blond.

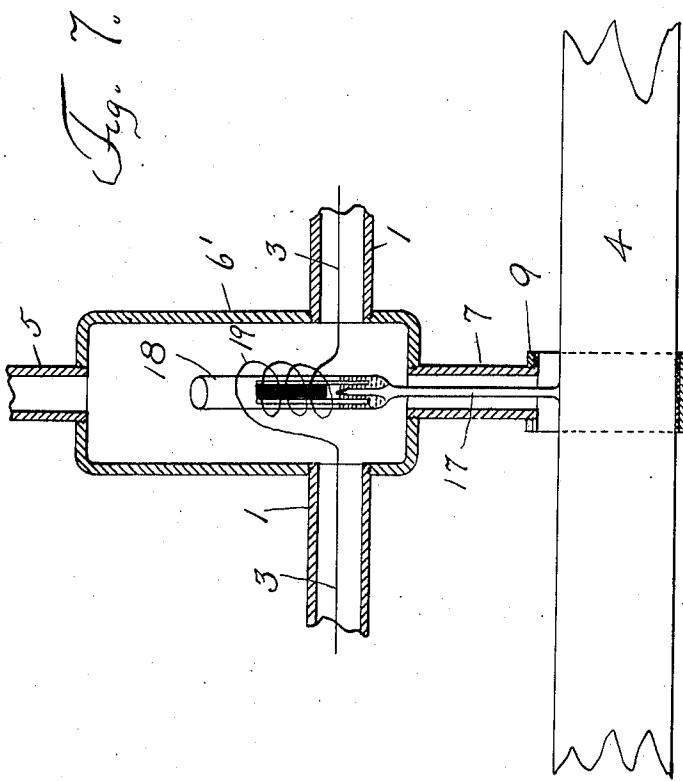
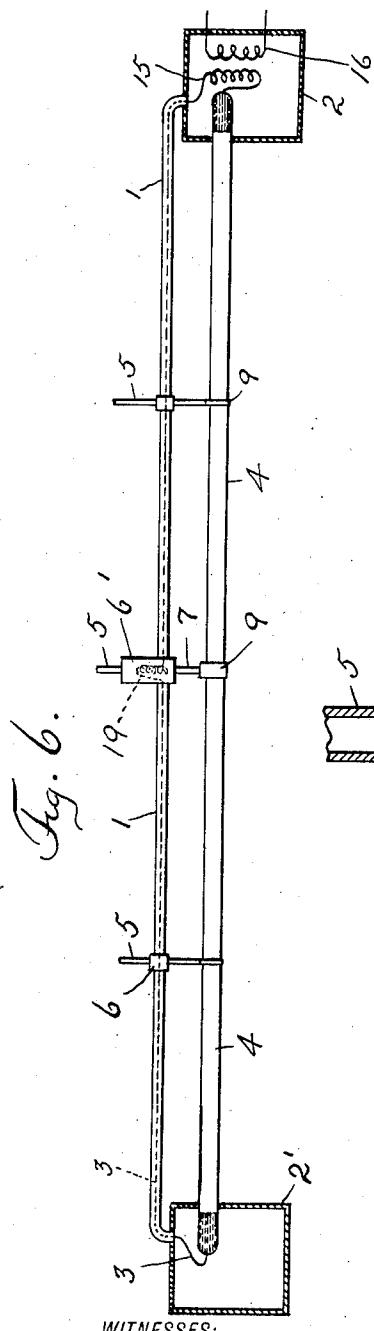
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3 SHEETS—SHEET 3.



WITNESSES:

C. Fischner.
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UNITED STATES PATENT OFFICE.

DANIEL MCFARLAN MOORE, OF NEWARK, NEW JERSEY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

Fixture for Vacuum-Tube Lamps.

1,028,092.

Specification of Letters Patent. Patented May 28, 1912.

Application filed February 26, 1907. Serial No. 359,446.

To all whom it may concern:

Be it known that I, DANIEL MCFARLAN MOORE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, with post-office address 52 Lawrence street, have invented certain new and useful Improvements in Fixtures for Vacuum-Tube Lamps, of which the following is a specification.

10 This invention relates to my system of vacuum tube electric lighting in which a glass tube containing a luminous vapor or gas is extended over the spaces to be lighted and is supported at intervals from the ceiling or other support.

15 My invention relates more particularly to the manner and means for installing the system of lighting of the character above referred to, and consists, among other things, 20 in the particular means or manner of supporting the tube and in, at the same time, protecting the electric conductor or conductors forming a supply wire or wires for said tube or constituting any other essential portion 25 of the system while, at the same time, utilizing said means of protection as a part of the means for supporting the tube when finally installed.

Briefly stated, one part of my invention 30 consists in suspending or supporting the vacuum tube in a fixture which is itself sustained by an electric conduit containing a high tension or other electric conductor of the system, said conduit being itself suspended from a ceiling or other suitable support in the building or other interior or location where the tube is to be installed.

35 My invention further consists in details of construction and features of organization 40 of the installation whereby cheapness and facility of installation may be secured and other advantages obtained, as will be more apparent to those skilled in the art from the following description of the preferred. 45 manner of carrying out the invention.

In the preferred manner of carrying out the invention, the suspension devices for the

fixtures consist of sections of tubing joined by a suitable coupling box with the continuous line of conduit through which the 50 supply wire or wires are run.

The invention consists further in the details of construction and combinations of devices hereinafter more particularly described and then specified in the claims.

55 In the accompanying drawings, Figure 1 is a side elevation of an apparatus embodying my invention and shows the same as applied to the installation of a vacuum tube for lighting a department store. Fig. 2 is 60 an enlarged view of devices at the point where the tube supporting fixture is sustained from the conduit. Fig. 3 is a cross section through the conduit and vacuum tube and shows the supporting fixture and 65 devices in end elevation. Fig. 4 is a vertical section through the insulating supporting block of the fixture. Fig. 5 is a diagram of circuits showing another electrical system of supplying energy to the tube. Figs. 6 70 and 7 show the manner of supporting the tube and feeding gas to the same at or near its center.

75 1 indicates a conduit of iron or other suitable material extending at one end from a terminal box 2.

80 3 is a high tension conductor running through the conduit 1 and joined in the terminal box in the usual way to any suitable source of energy. 4 is the vacuum lighting 85 tube extending at one end from the box 2 and having its electrode therein joined to an opposite pole of the high tension energy source. At 2' is another terminal box in which the electrode of the opposite end of the vacuum tube is joined to the electric conductor 3 running through the conduit 1, said conduit being connected to said terminal box as indicated. At suitable intervals, the conduit is sustained by the hangers 5 90 depending from the ceiling or other suitable support.

95 For cheapness and convenience I employ at intervals in the conduit 1 suitable cross-

shaped tube junction boxes or hollow couplings 6 to which the hangers 5 are connected by pipe junctions as indicated, while said cross-shaped junction boxes also afford means for coupling the sections of conduit together. At these junction points are also preferably located the devices for suspending or supporting the vacuum tube 4. These suspension or supporting devices are preferably sustained by hangers 7 formed from sections of metal tubing joined to the junction boxes 6 by a proper pipe junction. If desired, a reducing bushing 8 may be used at the junction.

The fixture for supporting the tube 4 may be of any construction but is here shown as comprising merely a ring 9 furnished at its inside with a lining of asbestos or other suitable material 10. The ring may be made of brass but is properly insulated, preferably from the hanger 7 and the conduit 1 for which purpose I use a porcelain block 12 or block of other insulating material to the lower end of which the ring is fastened by a suitable screw 13 as shown in the section, Fig. 4. The block of insulation itself is provided with the vertical bore or cavity 14 which is countersunk as shown to support a head for the screw 13, the latter extending down through the lower portion of the bore or opening to engage the ring. The tubular hanger 7 forms at its lower end a socket for the top portion of the insulating block 12 and the latter is properly clamped in the tube 7 by means of a screw 16 which passes through an opening in the side of the tube 7 and into the bore or cavity 14 to engage the inside wall thereof and force it laterally against the inside wall of the tube 7.

I do not limit myself to the particular means shown for supporting the tube-supporting fixture itself from the end of the hanger 7, nor to the particular means for securing the block to the end of the hanger.

Nor do I limit myself to the use of a tubular hanger, although I prefer to make the same tubular since it affords means for running down a branch conductor to an electrode of the tube from a conductor in the conduit 1 when it is desired to use a series of vacuum tubes arranged end to end and having electrodes within the supporting fixture as would be the case if the tubes were supplied with energy according to the system set out in my prior application for Patent No. 315,726, filed May 8th, 1906. This system is diagrammatically indicated in Fig. 5.

I do not limit myself to the use of a ring and supporting fixture for the tube, but might use other forms of support having greater dimensions in the direction of the tube's axis and constructed to have additional capacities besides that of merely supporting the tube.

In the drawing, Fig. 1, one of the junction boxes 6' is shown of somewhat larger dimensions to afford space for the devices by which gas is fed into the tube automatically to maintain a constant gaseous tension in any desired manner as, for instance, in the manner described in my prior Patent 820,364, dated May 8th, 1906. This device together with the circuits of the apparatus and one of the ways of connecting the regulating magnet is shown in detail in Fig. 6.

The terminal box 2 already described contains the usual transformer forming a high tension energy source. The secondary 15 of said transformer is connected to one electrode of the tube 4 and one terminal of the conductor 3 as therein illustrated. The primary of said transformer is indicated at 16. In the remote terminal box 2' where the straight run of tubing 4 terminates, the opposite electrode of the straight run of tubing connects to the high tension conductor 3 running through the conduit 1.

The hanger 7 and fixture 4 sustained from junction box 6' are of any suitable construction but are adapted to allow the passage of the gas feed tube 17 which passes through the fixture and hanger into the box 6' wherein are located the devices for feeding the gas in regulated amounts into the tube. The manner of connection of the fixture and hanger may be modified at this point as shown in Fig. 7 from the construction shown in the other figures. By feeding the gas into the center of the tube, more equal diffusion of the gas and a more uniform luminosity throughout the tube is secured.

18 indicates the end of the tube through which gas from the desired source passes into the valve casing and through the valve into the feed tube 17. The feed regulating magnet 19 is suitably connected to the conductor or conductors running through the conduit 1. It may be connected to any of the circuits of the system proper for causing the feed to take place in the manner required but, as shown, is connected into the direct circuit of the high tension conductor 3. By thus locating the gas feed apparatus at or near the center of the luminous tube, I not only secure the advantages described of equal diffusion and uniform luminosity, but also avoid the necessity of running out long feed tubes from the terminals of the luminous tube.

The fixture for vacuum tube lighting comprising the supporting tube, a block of insulation having a vertical countersink, a tube-supporting ring, a fastening screw for securing the ring to the lower side of the block and a clamping screw passing through the side of the supporting tube and into said block, is not herein claimed as it forms the

subject of claim in my companion application filed February 26th, 1907, Serial Number 359,445.

What I claim as my invention is:

5. 1. In a vacuum tube lighting system, the combination of a wire conduit sustained from a ceiling or other suitable support by hangers, a vacuum tube sustained at intervals from said conduit, a hollow hanger connected to the conduit and an insulating block secured to said hanger and having an attached ring through which the tube passes.

2. The combination with a vacuum tube, of a sustaining ring support therefor, a block of insulating material to the lower side of which the ring is fastened and a tubular hanger or support forming a socket for the block of insulation.

3. The combination with a vacuum tube, 20 of a sustaining ring support therefor, a block of insulating material to the lower side of which the ring is fastened, a tubular hanger or support forming a socket for the block of insulation, and means for clamping 25 the block in said hanger.

4. In a vacuum tube lighting system, a hollow conduit for a wire of the system having cross-shaped hollow couplings inserted at intervals therein, said couplings having, 30 on the one hand, hangers coupled thereto and affording means for supporting the vacuum tube, and, on the other hand having connected hangers whereby the coupling itself may be supported from a ceiling or 35 other suitable support.

5. In a vacuum tube lighting system, the combination of a vacuum tube, supporting devices sustaining the tube at points intermediate of its ends, an automatic gas feed 40 apparatus carried by said supporting devices and provided with a feed regulating magnet, a gas feed tube connecting the tube at the point of support with the gas feed apparatus at said point and connections 45 leading from the feed regulating magnet at such points to the opposite terminal of the tube.

6. In a vacuum tube lighting system, a vacuum tube sustained at intervals from a 50 wire conduit and having an automatic magnetic gas feed apparatus located at the points of support and connected through said wire conduit with the terminals of the tube.

55. 7. In a vacuum tube lighting system, a wire conduit sustaining vacuum tube fixtures, a hollow coupling located in said conduit, and containing gas feed regulating devices, and a gas feed tube extending therefrom through the tube fixtures into the tube.

8. In a vacuum tube lighting system, an electric conduit containing a wire of the system and having a hollow coupling inserted in it, and a vacuum tube fixture supported

by a hollow hanger from said coupling and 65 affording a passage for a gas feed tube whereby gas may be fed into the vacuum tube.

9. In a vacuum tube lighting system, a wire conduit containing a wire of the system and provided with a hollow coupling connecting two sections of said conduit, said coupling being provided with a hanger adapted to sustain a fixture for the vacuum tube.

75 10. In a vacuum tube lighting system, a wire conduit containing a wire of the system and provided with a junction box connecting two sections of said conduit, said junction box being provided with a hollow hanger carrying a supporting fixture for the vacuum tube and affording a passage for a gas feed tube feeding gas to the vacuum tube.

80 11. In a vacuum tube lighting system 85 having vacuum tube supporting fixtures sustaining said tube at intervals, a wire conduit provided with means for supporting said fixtures and with a hollow coupling box at an intermediate portion of the tube 90 length, said box being adapted to contain a gas feed regulating magnet and being further provided with a hollow hanger through which a gas feed tube may extend to connection with the vacuum tube.

95 12. In a vacuum tube lighting apparatus, a vacuum tube extending from one terminal box to another terminal box, a conduit from which the tube is sustained at intervals, a source of electric energy in one box connected at its poles respectively to one terminal of the tube and to one terminal of the supply conductor running through the conduit, a connection in the opposite terminal box between said supply wire and the opposite terminal of the tube, and a gas feed apparatus having the feed regulating magnet included in the circuit of the supply wire at one of the points of support of the tube near its center and its gas feed tube connected to the vacuum tube at or about the center of the system.

100 13. In a vacuum tube lighting system, having vacuum tube supporting fixtures sustaining said tube at intervals, a wire conduit carrying said fixtures and a gas feed regulating magnet located at a point of support and having its connecting wires running through said conduit.

115 14. In a vacuum tube lighting system 120 comprising a vacuum tube having an automatic magnetic gas feed, a conduit for the circuit of the magnet having a hollow hanger adapted to inclose the gas feed tube and carrying a sustaining fixture for the vacuum tube itself, as and for the purpose described.

125 15. In a vacuum tube lighting system, a

tube supporting hollow hanger adapted to afford a passage and inclosure for a gas feed tube feeding gas to the vacuum tube as and for the purpose described.

5 16. In a vacuum tube lighting system having an automatic magnetic gas feed, the combination substantially as described, of a wire conduit having hollow coupling boxes adapted to contain the automatic magnetic

10 gas feed devices, the connecting wires for

the magnets of said feed devices being run through said tube as and for the purpose described.

Signed at New York in the county of New York and State of New York this 30th day 15 of January A. D. 1907.

DANIEL McFARLAN MOORE.

Witnesses:

C. T. TISCHNER, Jr.,
LILLIAN BLOND.