Sept. 9, 1924. 1,508,373

E. N. LIGHTFOOT

CONNECTER

Filed Jan. 17, 1921

Fig. 1.

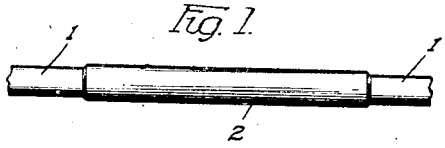


Fig. 3.

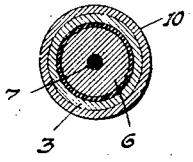


Fig. 4.

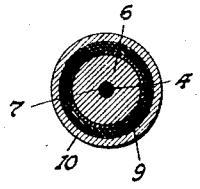


Fig. 5.

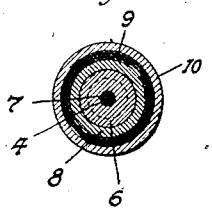


Fig. 2.

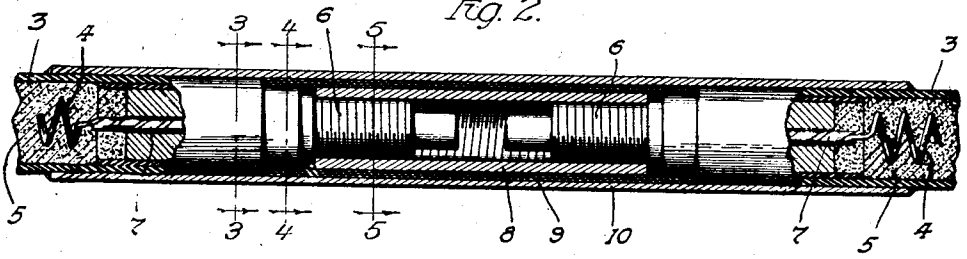


Fig. 6.

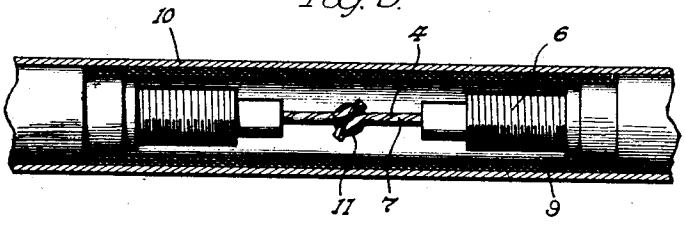


Fig. 7.

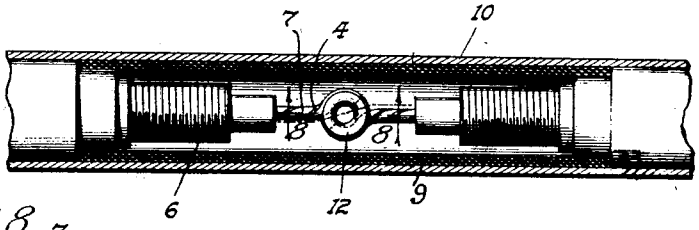
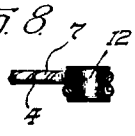


Fig. 8.



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Patented Sept. 9, 1924. 1,508,373

UNITED STATES PATENT OFFICE.

EDWIN N. LIGHTFOOT, OF NEW YORK, N. Y., ASSIGNOR TO THE CUTLER-HAMMER MFG. CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

CONNECTER.

Application filed January 17, 1921. Serial No. 437,792.

To all whom it may concern:

Be it known that I, EDWIN N. LIGHTFOOT, a citizen of the United States, residing at New York, in the county of Bronx and State of New York, have invented new and useful Improvements in Connecters, of which the following is a specification.

This invention relates to a connecter.

This connecter is particularly adapted to join two tubular electric heaters end to end, although it may be used for other purposes.

An object of this invention is to provide an efficient and durable connecter.

Another object is to provide a connecter which is not affected by temperature changes.

Another object is to provide a connecter which may be readily and economically manufactured.

According to the invention, the connecter comprises a conducting element for electrically joining the terminals of two heaters and an enclosing tube mechanically connecting the jackets of the heaters and insulated from the conducting element.

In the drawing,

Fig. 1 shows two tubular heaters coupled by a connecter.

Fig. 2 is an enlarged horizontal section through the connecter and tubular heaters coupled thereby.

Fig. 3 is a transverse section on line 3—3 of Fig. 2.

Fig. 4 is a transverse section on line 4—4 of Fig. 2.

Fig. 5 is a transverse section on line 5—5 of Fig. 2.

Figs. 6 and 7 are enlarged horizontal sections showing modified forms of connecters.

Fig. 8 is a section on line 8—8 of Fig. 7.

Figs. 1 to 5 will first be described.

Two tubular heaters 1, 1 may be joined together end to end by means of a connecter 2.

The tubular heaters may be of the type disclosed in Patent 1,359,400 issued November 16, 1920.

The tubular heater 1 comprises in general an elongated tubular jacket 3 having a helical resistor 4 arranged therein and insulated therefrom by suitable insulation 5, and a plug terminal 6 in the end of the jacket and connected with the resistor 4 by means of a terminating connecter 7.

The terminating connecter 7 may be of the type disclosed in a co-pending application Serial No. 414,280 filed October 2, 1920, by Charles A. Deuscher.

The connecter 2 comprises an internally threaded conducting sleeve 8 into which the threaded plug terminals 6 of two tubular heaters 1 may be screwed, an insulating sleeve 9 and a tube 10 surrounding the insulation and rigidly fastened to the respective heater jackets.

The sleeve 8 may be made of brass, copper, steel or other material of high current conductivity.

Of course, the conducting element of the connecter may assume other forms.

The insulating sleeve 9 may be formed of a strip or strips of mica, or other insulating material wound over the conducting sleeve 8 and built up to an overall diameter approximating the diameter of the tubular jacket of the heater.

The length of the enclosing tube 10 is such that it extends over the ends of the jackets of the tubular heaters.

The enclosing tube 10 may be fastened to the jackets by welding, swaging, brazing or other means.

In Fig. 6 the connecter shown is similar to the connecters of Figs. 1 to 5 inclusive except that instead of employing a sleeve 8 of conducting material for electrically connecting the terminals of two heaters the ends of the terminating connecters 7 in which the resistors are embedded are brought together and brazed or otherwise permanently electrically connected as at 11.

Figs. 7 and 8 show how the connecters 7 and resistors 4 may be electrically joined by means of an eyelet 12 which may be flanged or crimped to firmly grip the same.

By means of a connecter such as described, any number of tubular heaters may be joined end to end and thereby provide a heater of any desired length.

Among the advantages of a connecter as herein described are the following:

The electrical connection is of low resistance.

The electrical connection is insulated and protected mechanically.

The connecter is durable and efficient.

The connecter is not affected by variations of temperature.

The electrical connection is free from mechanical strain.

The invention contained herein is obvi-

ously susceptible of various embodiments and adaptations.

The invention claimed is:

1. Means for connecting two tubular electric heats having terminals extending from the ends of the jackets thereof, comprising a conducting sleeve for receiving the heater terminals, and a tube surrounding and insulated from the conducting sleeve, the tube being arranged to be rigidly fastened to the heater jackets.

2. Means for connecting two electric heaters equipped with terminals, comprising a conducting connecter for telescopically receiving the heater terminals.

3. Means for mechanically and electrically connecting two tubular electric heaters having tubular jackets and terminals extending from the ends thereof, comprising a connecter for electrically joining the terminals, and an enclosing tube for the connecter insulated therefrom and arranged to be rigidly fastened to the heater jackets.

4. Means for connecting two tubular heaters, comprising a sleeve to receive the ends of the heaters, insulation enclosing the sleeve, and a tube surrounding the insulation and arranged to be rigidly fastened to the tubular heaters.

5. A connecter for electric heaters comprising a hollow conductor, heater terminals extending inside the conductor and secured thereto, insulation completely covering the conductor, and a jacket surrounding the insulation and fastened at each end to the heaters.

6. A connecter for electric heaters, comrising a tubular conductor with internal threads adapted to receive a pair of threaded terminals, a tubular jacket surrounding the conductor, and insulation between the conductor and the jacket.

7. An electrical connecter comprising a sleeve having threads cut in each end thereof and adapted to receive a pair of threaded heater terminals, insulation surrounding the sleeve and a metallic tube surrounding the insulation.

8. A connecter for electric heaters having a threaded tubular conductor, a threaded terminal attached to each end of the conductor, a metallic sleeve surrounding the conductor and fastened at each end to the heaters, and mica separating the conductor from the metal sleeve.

9. A connecter for electrically and mechanically connecting two tubular heaters comprising a sleeve adapted to connect the heaters electrically, a tube surrounding the sleeve to connect the heaters mechanically, and insulation between the sleeve and tube.

10. A connecter for electrically and mechanically joining two tubular heaters comprising an internally threaded sleeve to receive threaded heater terminals and connect the heaters electrically, insulation surrounding the sleeve, and a metallic tube enclosing the insulation arranged to be rigidly fastened to the heaters.

11. Means for electrically and mechanically connecting two electric heaters, comprising a connecter for joining the terminals of the heaters electrically, insulation surrounding said connecter and a tube surrounding the insulation and rigidly secured to the walls of the electric heaters.

12. In combination, a pair of electric heaters, terminals and jackets therefor, means for joining the terminals electrically, means for joining the jackets mechanically, and insulation between said electrical and mechanical connecting means.

13. A connecter for electric heaters comprising an internally threaded tubular conductor adapted to receive a pair of threaded electric heater terminals, and an insulating covering for said conductor.

14. A connecter for electric heaters having tubular jackets and threaded terminals extending therefrom, comprising a threaded conductor adapted to join said terminals, an insulating member surrounding said conductor, and reinforcing means adapted to bridge the adjacent portions of the tubular jackets.

In witness whereof, I have hereunto subscribed my name.

EDWIN N. LIGHTFOOT.