W. MAYALL.

ELECTRIC HEATER.

APPLICATION FILED NOV. 1, 1919.

1,381,322. Patented June 14, 1921.

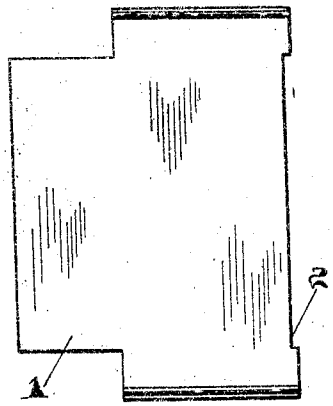


Fig. 1.

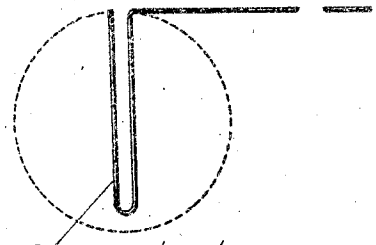


Fig. 2.

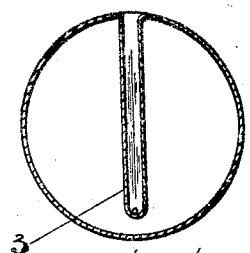


Fig. 3.

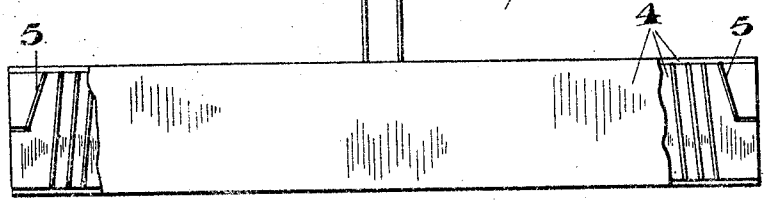


Fig. 5.

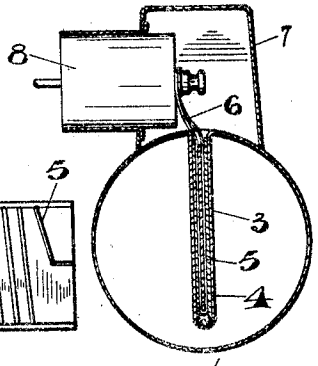


Fig. 4.

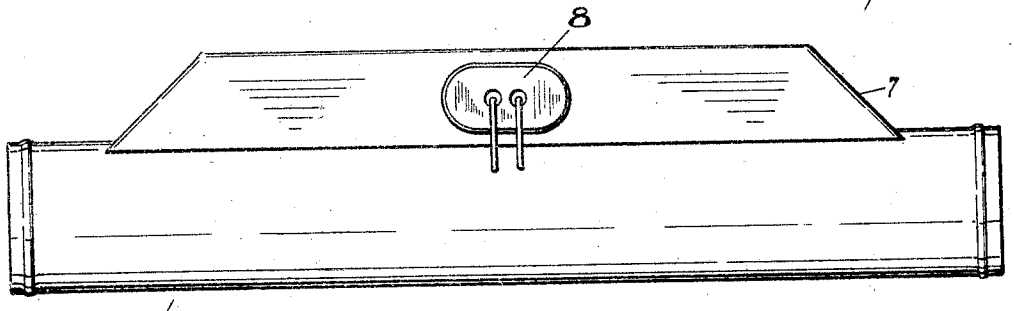


Fig. 6.

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ELECTRIC HEATER.

1,381,322. Specification of Letters Patent. Patented June 14, 1921.

Application filed November 1, 1919. Serial No. 334,997.

To all whom it may concern:

Be it known that I, WILLIAM MAYALL, of the city of Toronto, in the county of York, Province of Ontario, Canada, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to heaters particularly adapted for use in heating the water circulating in the cooling systems of internal combustion motors such as set forth in my application for a patent filed February 3rd, 1919, Serial No. 274692, and my object is to devise a specific construction of the heater and a process of forming the same which will reduce manufacturing costs to a minimum and at the same time produce a heater of very compact form which will not in any way choke the flow of liquid and which will be economical to operate.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings in which—

Figure 1 is a plan view of a blank from which the body of the heater is formed;

Fig. 2 a side elevation of the same after it has been folded and bent to form a pocket;

Fig. 3 a similar view showing the blank bent round to tubular form;

Fig. 4 a cross section of the completed heater;

Fig. 5 a side elevation of the electric heating element; and

Fig. 6 a side elevation of the complete heater.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

In Fig. 1 is shown the blank of which the body of the heater is formed. This blank is provided at one side with a rectangular extension 1 of less length than the rest of the blank, and of sufficient width to form when folded a pocket 3, preferably approximating in depth the diameter of the tubular body of the heater. At the opposite side of the blank is formed a rectangular notch 2 of substantially the same length as the extension 1, but of comparatively small depth, the depth approximating the desired width of the opening of the pocket, and as the electric heating element is formed as thin as possible, the opening of the pocket is comparatively small.

After the blank has been cut to shape the next step is to fold the extension 1 and bend it to the position shown in Fig. 2 in which it forms the narrow pocket 3 hereinbefore referred to. The pocket is then inserted in a slot in a roller as indicated in Fig. 2 and the rest of the blank rolled round of tubular form as shown in Fig. 3. The next step is to unite either by brazing or welding the adjacent longitudinal edges of the blank to form a watertight tube. The ends of the pocket are also welded or brazed together, the result being to form a tube having an opening in one side extending nearly, but not quite to the ends of the tube, which opening forms the mouth of the narrow pocket 3 extending radially inward of the tube. At any time during the operation of forming the tube the electric heating element shown in Fig. 5 may be inserted in the pocket.

This element is formed of sheets 4 of mica or other thin insulating material, on and between which is wound the resistance wire 5, the winding being preferably arranged so that the ends of a coil are at the center of the strips of mica. These ends 6 will therefore extend from the middle of the length of the pocket 3. Over the mouth of the pocket is placed a hollow cap 7, the edges of which are brazed or welded to the surface of the tube. This cap is preferably filled with mineral wool, asbestos, or similar insulating material. The cap 7 carries the terminals 8 to which the ends 6 of the resistance coil are connected. These terminals may be of any commercial form for connection with an ordinary extension cord.

Within the pocket 3 I locate a plug or strip of readily fusible material, its composition being such that it will melt if the temperature rises sufficiently to endanger the resistance wire, as will take place if the device be run with no water or other fluid passing through it. This plug serves therefore to determine whether a failure of the heating element is due to inherent defects or to bad treatment on the part of the user.

From the above description it will be seen that I have devised an electric heater and process of forming the same which will satisfactorily attain the objects of my invention as set out in the preamble to this specification.

What I claim as my invention is:—

1. A tubular electric heater casing formed

of an integral sheet of metal bent to tubular form and having a longitudinal fold therein forming an inwardly extending pocket open at its outer side and adapted to contain a heating element, the longitudinal edges of the sheet and the edges of the ends of the pocket being suitably secured together.

2. A tubular electric heater casing constructed as set forth in claim 1 in which the part of the sheet folded to form the pocket is of less length than the tube and extends from one side of the sheet, the other side of the sheet being notched out to provide an opening for the pocket.

3. A tubular electric heater casing constructed as set forth in claim 1 provided with a hollow cap secured to the tube over the open side of the pocket and having electric terminals secured thereto.

4. A blank for an electric heater casing comprising an integral rectangular sheet of metal bent to cylindrical form having a rectangular extension at one side folded longitudinally to form a pocket and having a notch cut in its opposite side of a depth substantially equal to the width of the mouth of the pocket and of substantally the same length as the rectangular extension.

5. The process of forming a tubular electric heater casing which consists in folding part of an integral blank longitudinally to form a pocket open at one side, bending round the remainder of the blank to form a tube into which the pocket extends and finally securing together the adjacent longitudinal edges of the blank and also the ends of the pocket.

6. The process of forming a tubular electric heater which consists in forming an integral rectangular blank with a rectangular extension at one side and a notch in the other side of the same length as the said extension but of small depth, folding the extension of the blank longitudinally to form a tube into which the pocket extends and securing together the adjacent longitudinal edges of the blank and also the ends of the pockets.

Signed at Toronto this 21st of August, 1919.

WILLIAM MAYALL.