

Sept. 10, 1929.

G. F. WEBB

1,727,459

CORE FOR ELECTRIC WATER HEATERS

Filed Feb. 29, 1928

2 Sheets-Sheet 1

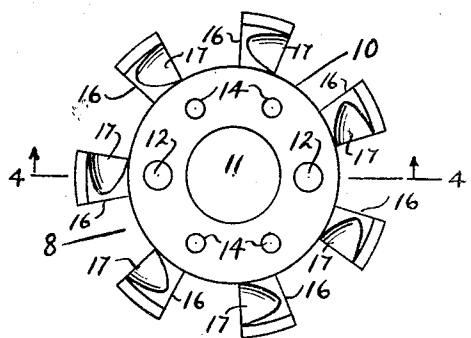


Fig. 2.

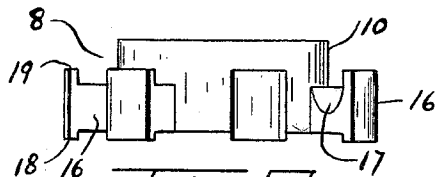


Fig. 3.

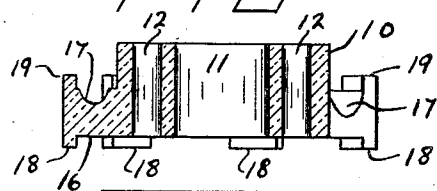


Fig. 4.

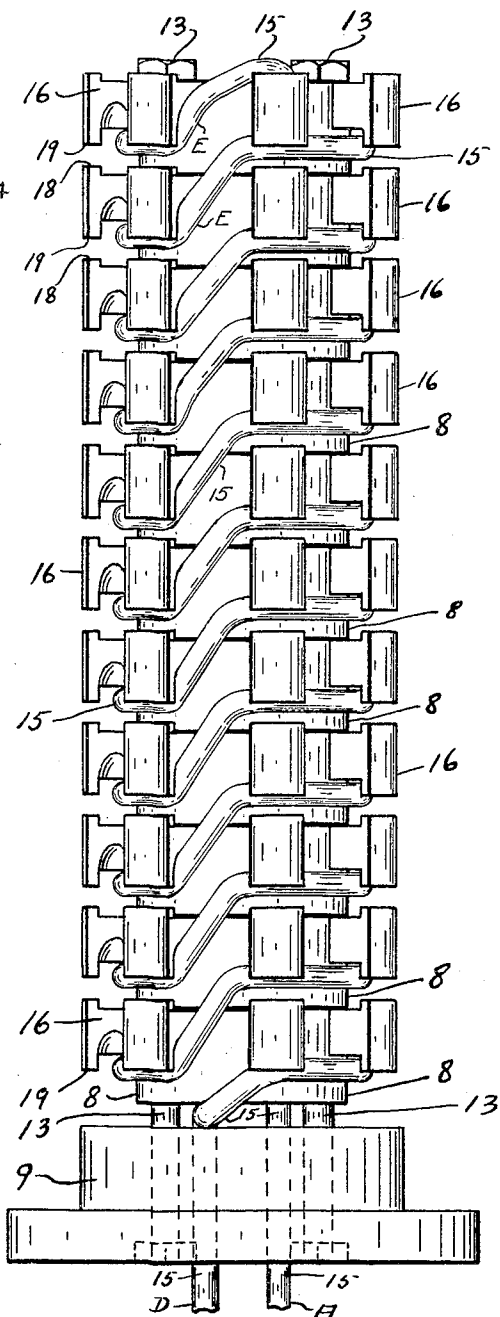


Fig. 1.

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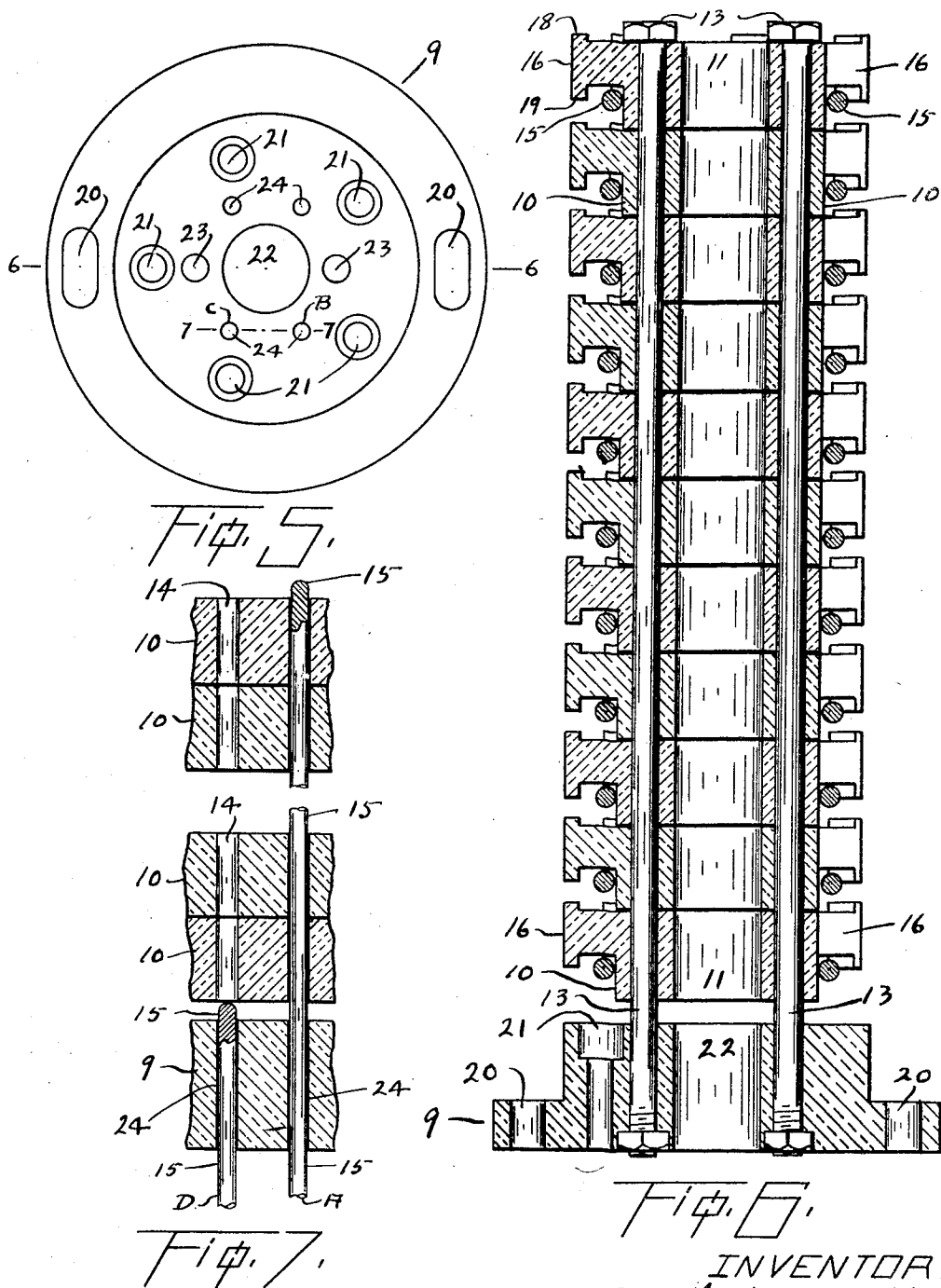
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# CORE FOR ELECTRIC WATER HEATERS

Filed Feb. 29, 1928

2 Sheets-Sheet 2



## UNITED STATES PATENT OFFICE.

GEORGE FREDERICK WEBB, OF HAMILTON, ONTARIO, CANADA.

## CORE FOR ELECTRIC WATER HEATERS.

Application filed February 29, 1928, Serial No. 258,103, and in Canada October 6, 1927.

My invention relates to improvements in cores for electric water heaters with more particular reference to the porcelain cores used therein for supporting the resistance wire or heating element and the object of the invention is to devise an improved construction for such cores.

My invention consists in the construction and arrangement of parts, all as hereinafter more particularly described and illustrated in the accompanying drawings in which;

Fig. 1 is a side elevation of a core constructed in accordance with my invention.

Fig. 2 is a bottom plan view of one of a number of porcelain core sections used in my core.

Fig. 3 is an edge elevation of Fig. 2.

Fig. 4 is a cross-section taken on the line 4—4 of Fig. 2 looking in the direction of the arrows.

Fig. 5 is a top plan view of a porcelain base or end section used in my core.

Fig. 6 is an axial section through my core, the section being taken on a line corresponding to the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary longitudinal section through a portion of my core taken on a line corresponding to the line 7—7 of Fig. 5, and shows the two end portions of the core only, the intermediate sections being omitted.

In the drawings like characters of reference indicate corresponding parts in the various views.

My core is built up from a number of separate core sections 8 and a base 9.

Each section 8 has a cylindrical central portion 10 having a central axial orifice 11 therethrough.

Extending longitudinally through the central portion 10 of each section 8 are two diametrically opposed passages 12 to permit passage of the rods or bolts 13 as will hereinafter be described.

Also extending through the central portion 10 are a number of passages 14 to permit passage therethrough of the resistance wire or heating element 15 as will presently be described.

Extending radially outward from the cen-

tral portion 10 are a number of circumferentially spaced apart lugs 16.

These lugs are offset towards one end face of the central portion 10 so that one face thereof is flush with one end face of the portion 10 and the other face of the lug is spaced inwardly from the other end face of the portion 10. The latter face of the lug is formed with a concavity 17 the purpose of which will later be explained.

At the outer end of each lug is formed longitudinally disposed extensions 18 and 19.

The base 9 may be of any suitable form and will be formed with suitable screw holes 20 and 21 for mounting upon the heater.

The base 9 however is provided with a central axial orifice 22 and with holes 23 and 24 adapted to register respectively with the orifices 11, 12 and 14 of the core sections when the core is assembled.

The manner of assembling my core is as follows:

A sufficient number of core sections 8 are superimposed upon each other to form a core of the desired length and two bolts 13 are passed through the aligned holes 12 in these sections and through the registering holes 23 in the base 9. The bolts 13 would be of sufficient length to leave the core sections 8 loose and permit a certain degree of relative axial movement thereof during assembling and winding of the heating element 15.

When the bolts 13 are in place the orifices 14 and 11 in the core sections are all in alignment and are also in registration with the orifices 24 and 22 respectively in the base 9 so as to form continuous passages through the core. Also the lugs 16 in all core sections are in longitudinal alignment.

Any suitable form of resistance wire may be used as a heating element 15 and would preferably be in the usual form of a spirally wound wire but for purposes of illustration it has been shown as a single wire.

In mounting the heating element one end is passed downwardly through the length of the core through one of the passages formed therein by holes 14 in the core sections 8 and one of the holes 24 in the base

and extends through the bottom of the base as shown at A in Figs. 1 and 7 (sufficient length extending below the base to permit connection to the heater control (not shown)). In the form illustrated this wire passes through the hole in the base indicated by the letter B in Fig. 5.

The heating element is then wound spirally upon the core from the top downwardly as shown in Fig. 1 and passes under the lugs 16 of the core sections 8.

As each revolution is completed about one core section, the wire is passed downwardly below the lugs 16 on the next core section and so on to the core section next to the base.

In this winding operation, in order to permit entry of the wire between the lugs 16, it is necessary that the core sections be sufficiently loose to permit a slight axial movement relatively to each other.

As the wire is wound upon each core section the pull of the wire draws each section closely against the section thereabove.

From the last core section the wire is passed inwardly between this section and the base 9 and downwardly through one of the orifices 24 (indicated at C in Fig. 5) in the base and sufficient wire is left projecting below the base (indicated at D in Figs. 1 and 7) to permit connection to the heater control.

The bolts 13 are then tightened so as to draw all the core sections 8 and the base together to form a rigid assembly and the ends of the bolts would then be cut off flush with the bottom of the base.

It is to be noted that the concave portions 17 of the lugs present a smooth surface to the wire so that when the wire is bent over these lugs no sharp edge is presented to injure the wire (see at E in Fig. 1).

Also while the core sections are loose during winding to permit insertion of the wire 15, when the assembly is completed the extensions 18 and 19 partially close the space between adjacent lugs so that the wire cannot get out of its proper position.

These lugs therefore form between themselves partially enclosed spaces within which the heating element is retained.

When assembled, it will be noted that the central orifices 11 of the core sections and the orifices 22 in base form an axial passage through the core which may be utilized for the passage of a water pipe axially through the core.

From the foregoing it will be evident that I have devised an improved core for supporting the heating element in electric water heaters whereby the objects of my invention have been attained.

It will be noted that in the winding described only a single heating element has

been used in which case only two of the orifices 24 in the base have been utilized but in the event of a multiple element the others would also be used.

Also while I have described the use of the bolts 13 to hold the core sections together, a water pipe extending through the central passage in the core formed by the orifices 11 and 22 might be threaded at each end of the core and nuts upon it used to draw the sections together in which case the bolts 13 could be omitted.

Various modifications may be made in my invention without departing from the spirit thereof or the scope of the claims and therefore the exact forms shown are to be taken as illustrative only and not in a limiting sense and I desire, that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

What I claim as my invention is:

1. A core for supporting the resistance wire in an electric water heater comprising, a plurality of superimposed cylindrical core sections secured together to form the core by rods extending longitudinally through the core, each section formed with a plurality of circumferentially spaced apart radial lugs, said lugs being in alignment longitudinally of the core, the lugs of each section being offset towards one end of the section so as to be flush with that end and spaced inwardly from the other end, each lug formed at its outer end with longitudinally disposed extensions.

2. A core for supporting the resistance wire in an electric water heater comprising, a plurality of superimposed cylindrical core sections secured together to form the core by rods extending longitudinally through the core, each section formed with a plurality of circumferentially spaced apart radial lugs, said lugs being in alignment longitudinally of the core, the lugs of each section being offset towards one end of the section so as to be flush with that end and spaced inwardly from the other end, each lug formed at its outer end with longitudinally disposed extensions and each core section formed with a central orifice therethrough, said central orifices registering with each other to form a central axial passage through the core.

3. A core section for a core of the class described, comprising a central cylindrical portion and a plurality of circumferentially spaced apart, radial lugs extending from the periphery thereof, said lugs being offset towards one end of the section, said central portion formed with a comparatively large axial orifice therethrough and with a plurality of comparatively small additional passages extending longitudinally there-through.

4. A core section for a core of the class

described, comprising, a central cylindrical portion and a plurality of circumferentially spaced apart, radial lugs extending from the periphery thereof, said lugs being offset towards one end of the section and formed with axially disposed extensions at their outer ends, said central portion formed with a comparatively large axial orifice there-through and with a plurality of comparatively small additional passages extending longitudinally therethrough.

5. A core section for a core of the class described, comprising a central cylindrical portion and a plurality of circumferentially spaced apart, radial lugs extending from the periphery thereof, said lugs being offset towards one end of the central portion so as to be flush with that end face of the central portion and spaced inwardly from the other end face of the central portion, and axially disposed extensions at the outer ends of the lugs, said central portion formed with a comparatively large axial orifice there-through and with a plurality of comparatively small additional passages extending longitudinally therethrough.

6. A core section for a core of the class described comprising, a central cylindrical portion and a plurality of circumferentially spaced apart, radial lugs extending from the periphery thereof, said lugs being offset towards one end of the central portion so as to be flush with that end face of the central portion and spaced inwardly from the other end face of the central portion, said inwardly spaced faces of the lugs formed with a concave portion, and axially disposed extensions at the outer ends of the lugs, said central portion formed with a comparatively large axial orifice therethrough and with a plurality of comparatively small additional passages extending longitudinally there-through.

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