J. D. ROSS.

ELECTRIC STEAM AND HOT WATER RADIATOR.

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1,158,723. Patented Nov. 2, 1915.

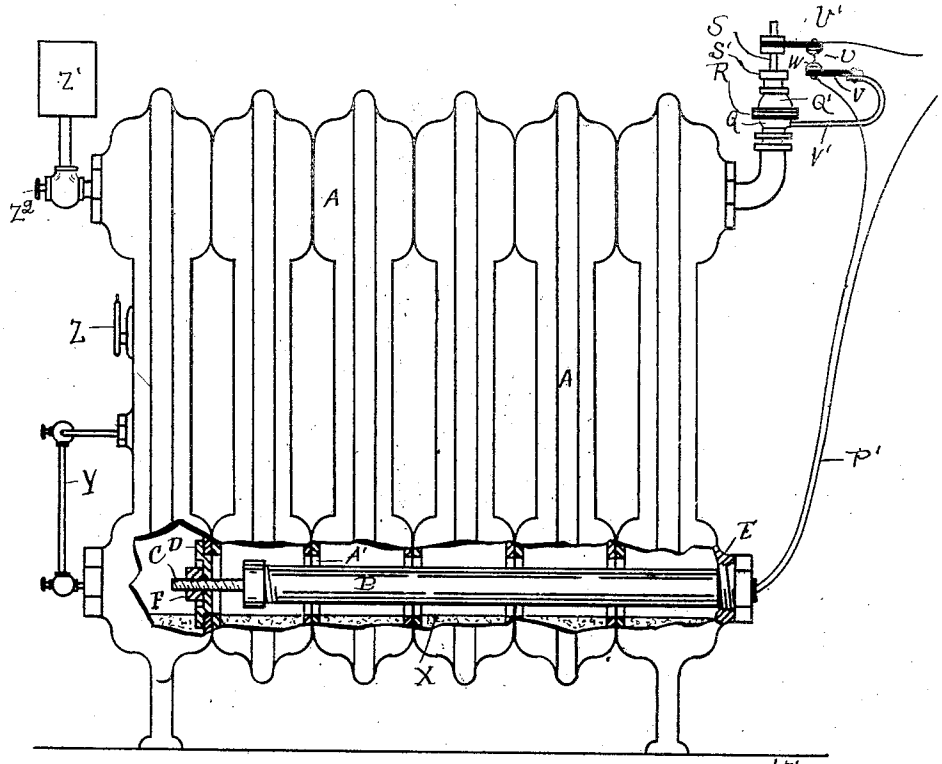


Fig. 1.

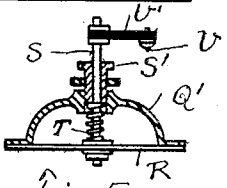


Fig. 5.



Fig. 6

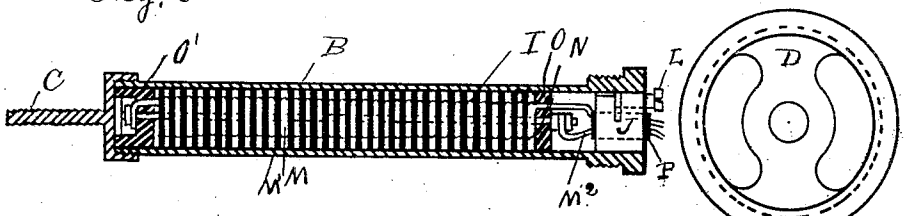


Fig. 2.

Fig. 3

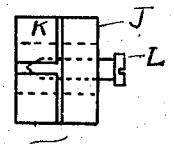


Fig. 4.

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ELECTRIC STEAM AND HOT-WATER RADIATOR.

1,158,723. Specification of Letters Patent. Patented Nov. 2, 1915.

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To all whom it may concern:

Be it known that I, JOHN D. ROSS, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Electric Steam and Hot-Water Radiators, of which the following is a specification.

The special object of the present invention is to provide a portable electric heating apparatus which may be used wherever necessary or desirable. It is specially designed to be used in chambers and other apartments to which a regular heating plant does not extend. To these ends it is important that the device be light and portable, that it be readily connected up and disconnected, that it operate with only a small quantity of water, that it afford a large amount of radiation, that it be automatically regulated, and that it be economical.

It may be used wherever an electric current is available.

In the drawings herewith accompanying and making a part of this application, Figure 1 is a side elevation of my improved apparatus, a portion of the radiator being broken away to show the application of the heater thereto; Fig. 2 is a longitudinal sectional view of the heater; Fig. 3 is an elevation of the washer for supporting the inner end of the heater; Fig. 4 is an elevation of the plug which supports the outer end of the heater in the heating tube; Fig. 5 is a sectional view of the upper member of the regulator; and Fig. 6 is an elevation of one of the insulators used in the heater.

Same reference characters indicate like parts in the several figures.

In said drawings A is a series of radiator sections provided with the usual conduits A′ at the top and bottom and having the sections at the top coupled together in the usual way. Instead of the rod in common use for bonding the sections together at the bottom, I use a tubular rod B having a threaded extension C adapted to be supported in a flanged washer D supported in the water way of the last section, as seen in Fig. 1. The tubular rod B is threaded on the other end and adapted to engage the threaded nipple E of the outer radiator section, by which means the tubular rod is centrally supported in the lower water way in the radiator. The rod may be held in place by a nut F on said threaded extension. In this way, the tubular rod serves to bond the sections together. In the tubular portion of rod B is inserted an electric heater I of any convenient construction. As shown, it consists of a plug J, one portion K of which is split longitudinally and is adapted to be expanded against the wall of the tube by means of an expanding screw L and a heater proper consisting of a spiral wire M separated by insulations M′ and wound around but insulated from a conductive rod N. The ends of this rod are mounted in insulating supports O and O′ respectively. The wire at the inner end of the tube is in electrical connection with rod N and at the outer end of the tube passes through an insulating plug P set in the plug J. The end of the rod in the outer end of the tube is provided with a wire M^2 in electrical connection therewith extending through said plug P. The ends of these wires are placed in an electric feed circuit P′ in the usual manner. The radiator is provided with a steam operated regulator comprising two cups Q and Q′ with an elastic diaphragm R interposed between them. Supported on the top of the diaphragm is a rod S which passes up through a threaded nut S′ secured to the top of cup Q′. The tension of the elastic diaphragm is adjusted by means of a coil spring T interposed between the top of the diaphragm and the threaded nut S′. The rod S carries a contact U insulated therefrom by an arm U′. An insulating arm V supported on a stationary bracket V′ has a contact W, said contacts being in the feed circuit.

In the construction of radiators of this type there is necessarily a considerable portion below the water way between the sections, and to prevent the collection of cold water in these lower spaces, I fill them with some impervious cement to a point just even with the circular openings between the sections, as seen at X.

The radiator may be provided with the usual fixtures, to wit, a gage glass Y, air valve Z and expansion tank Z′ through which the radiator may be filled. When the radiator is to be used as a steam radiator, the connection between the radiator and the expansion tank can be closed by a valve Z^2.

The operation of my improved radiator is as follows: When the device is to be used as

a steam radiator, a very small quantity of water is left in the radiator, filling it to a point slightly above the top of the tubular rod B, the rod preferably being slightly submerged in the water. The electric current is then turned on, the rod becomes heated and the water in turn brought to the boiling point. As the pressure in the radiator increases to a certain point, the tension of the spring controlled diaphragm is overcome and the rod S moves upwardly until the contact is broken and the current automatically shut off. As soon as the pressure subsides, the diaphragm returns down, the circuit is again closed and the heating goes on as before. When the device is to be used as a hot water heater, the radiator will be filled with water and the valve Z^2 opened.

The advantages of my improved radiator are that it may be made of very thin material, that the heating device is concealed in the radiator and serves the double purpose of a bonding device to hold the sections together and for the heater. Again, only a very small quantity of water is required when the radiator is to be used as a steam radiator.

Having thus described my invention and its use, I claim:

1. In a device of the character described, a plurality of radiator sections provided with a conduit at the bottom, a chambered bonding rod centrally located in said conduit and of less diameter than the diameter of said conduit, a washer engaging the wall of one of the sections adapted to support the inner end of the rod, a threaded nipple on the first section adapted to support the outer end of said rod, and an electric heater located in said chambered rod.

2. In a device of the character described, a plurality of radiator sections provided with a conduit at the bottom thereof, a chambered bonding rod located in said conduit and adapted to hold the sections together at the bottom, an electric heater in said chambered rod, an electric circuit, and means for automatically making and breaking the circuit as the pressure in the sections passes below or above a given degree.

3. In a device of the character described, a plurality of radiator sections provided with a conduit at the bottom, the sections below said conduit being filled with a cement-like substance, a chambered bonding rod located in said conduit, and an electric heater inserted endwise in said chambered rod.

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