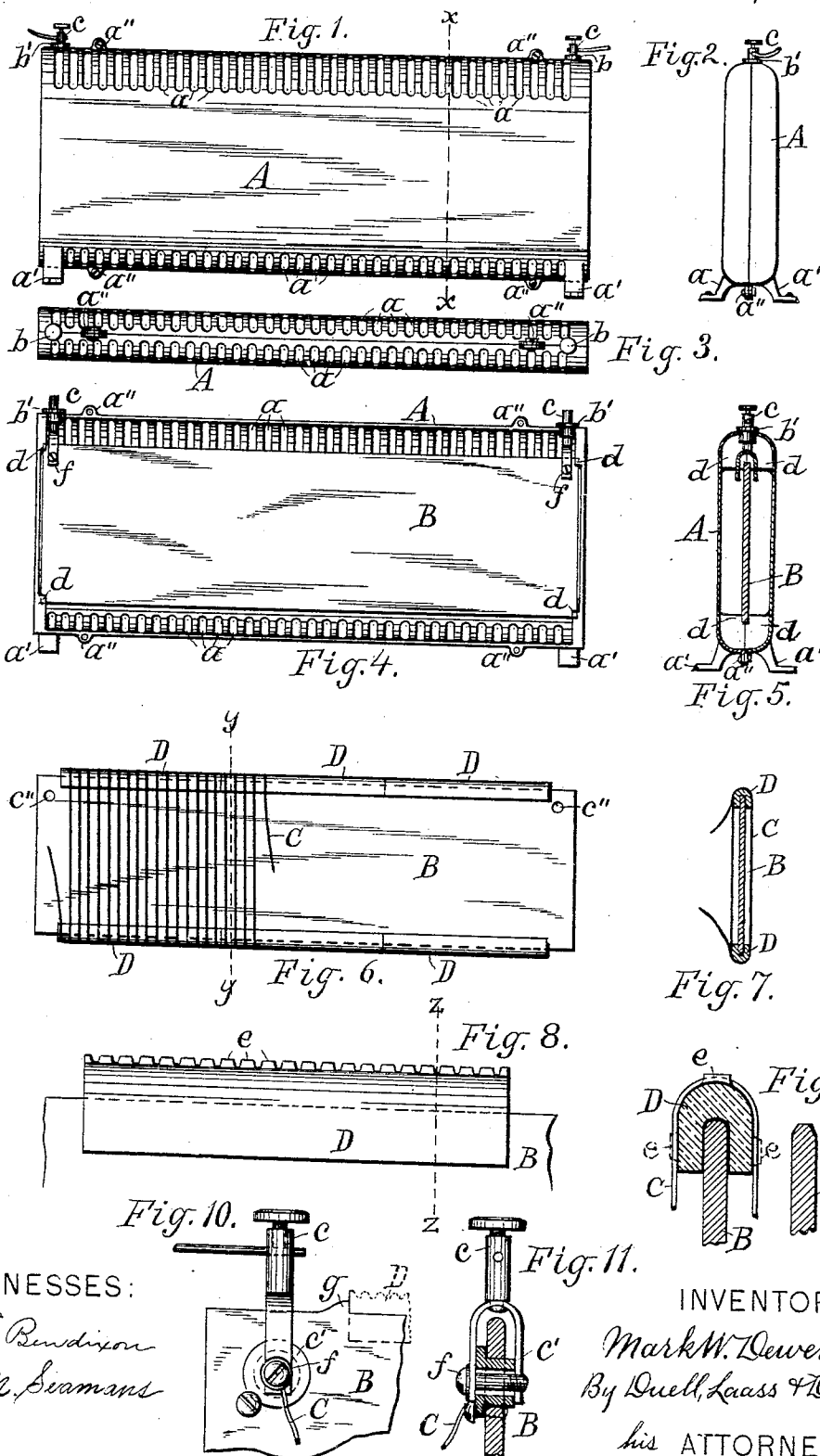


(No Model.)

M. W. DEWEY.
ELECTRIC HEATING APPARATUS.

No. 494,291.

Patented Mar. 28, 1893.



WITNESSES:

C. L. Bendixon
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INVENTOR,

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By Quell, Laess & Quell,
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DEWEY ELECTRIC HEATING COMPANY, OF SAME PLACE.

ELECTRIC HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 494,291, dated March 28, 1893.

Application filed March 24, 1892. Serial No. 426,196. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric Heating Apparatus, (Case No. 102,) of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to electric heating apparatus wherein the resistance or heat developing conductor is of small size or cross-section.

The object of my invention is to provide a simple, cheap, durable and efficient electric heater that will have a large radiating surface and yet occupy a small space.

My invention consists in the combination in an electric heater of a support, a plate on the support, saddles of insulating material on two edges of the plate, and a resistance-conductor wound around the plate and saddles.

My invention consists also in the combination in an electric heater of a support consisting of a case or inclosure divided longitudinally in two parts, supports or holding devices on the interior of the case, a plate or thin body held by said devices parallel to and in the plane of the meeting edges of the parts of the case, a resistance-conductor wound around the plate, supply conductors leading through the case to the terminals of said resistance conductor, and means to hold the parts of the case together and the plate or thin body in position.

My invention consists also in certain other combinations of parts hereinafter described and specifically set forth in the claims.

By my arrangement I am enabled to use less expensive wire having a lower resistance, a greater radiating surface, and a larger gage than the wire usually employed and to confine it to a small space without the liability of a short circuit being formed by contact between two convolutions thereof. When the heater is limited in size German silver wire may be used or other high resisting material, and when iron is used it may be galvanized or coated with copper or other suitable material to keep it from rusting when not in use and exposed to a humid atmosphere.

In the accompanying drawings, Figure 1 is a side elevation of the complete heater. Fig. 2 is an end elevation. Fig. 3 is a top view. Fig. 4 is a view of the heater with a half or one of the parts of the support or casing removed. Fig. 5 is a cross section on line *x, x*, of Fig. 1. Fig. 6 shows a side elevation of the plate inside of the case with the saddles on the edges and the resistance-conductor partly wound around the same. Fig. 7 is a cross section of the plate, &c., on line *y, y*, of Fig. 6. Fig. 8 is a side elevation of one of the saddles of insulating material enlarged. Fig. 9 is a cross section on line *z, z*, of Fig. 8, and shows also edges of plates both round and chamfered. Fig. 10 is an enlarged side view of a terminal fixed to a corner of a plate, and Fig. 11 is another side elevation of the terminal with the plate and bushing in section.

Referring specifically to the drawings, A—represents the support, screen or case holding and inclosing the plate and resistance-conductor. This case has a square or rectangular shape and has perforations or slots —*a*— on the top and bottom to allow the circulation of air therethrough. The slots extend to and in the sides of the case, those in the top being the longest. The top is the warmest part of the heater, and therefore is provided with larger apertures to permit the heated air to escape rapidly.

The casing —A— is divided in the middle vertically and longitudinally in two parts, one of the parts being of the same shape, but the reverse of the other part. Each part has a foot or leg —*a'*— at each end to raise it from the floor. The parts are held together by screws or bolts —*a''*— passing through extensions on the top and bottom of the parts. In the top of the case, at each end, between the meeting edges is a hole —*b*— with an insulating or porcelain bushing —*b'*— therein for the supply conductors or terminals —*c*— to enter. When the case is not made of metal, which, however, is the material preferred, but of earthenware, as porcelain or some other insulating material the bushings will not of course be required.

B—is the plate around which the resistance-conductor or wire —C— is wound, and which is supported, held and inclosed by the case

—A. The said plate may be of metal, slate or porcelain or other suitable material. If the plate or thin body is made of slate or porcelain or other insulating and heat-resisting material, saddles —D— will not be absolutely necessary on the edges thereof, but said saddles are preferably used even then in order to allow thin plates to be used so that the heater will be light, to hold the wire a distance from the plates so that they will not be highly heated, and so that the heat may radiate from all sides of the wire. When the plate —B— is made of metal such as cast or sheet iron the saddles —D— are used to insulate the bare resistance wire —C— from the plate and to hold the convolutions apart or separated from each other. Said plate is supported in the center of the case —A— parallel to and in the plane of the junction of the parts of the case and extends the entire length of the case between its ends. The said plate only comes in contact with the case at its ends where it is held by suitable holding devices consisting of projections —d— at each corner of each part of the case. When the plate —B— is placed in position and the parts of the case —A— are fastened or clamped together by the screws —a''—, the plate will be held firmly between the said projections so that it cannot come in contact with the sides of the case. The plates may be plain, perforated or ribbed as desired.

The saddles —D— on the edges of the plate —B— are U-shaped in cross-section and made of porcelain, mica or other suitable vitrified or heated-resisting material. The porcelain saddles are molded with notches in or teeth —e— on the sides or round part to hold the convolutions of the wire —C— equal distances apart and to serve as a measure and guide when winding the wire. The notches or spaces between the teeth should be somewhat larger than the wire used.

The saddles —D— are preferably divided in sections and placed end to end, as shown in Fig. 6, as they are liable to warp when vitrified if made long.

The lower ends of the terminals or binding screws —c— for the heater are bifurcated so that they may extend on both sides of the plate —B. If the plate is made of insulating material, a screw —f— passed through a hole —c''— in plate and the bifurcated end of the terminal will secure the latter to the plate, but if the plate is constructed of metal as preferred, a bushing —c'— of porcelain or other insulating material is extended through the plate and insulates the latter from the said terminal and screw. The said screw not only serves to secure the terminal —c— to the plate —B— but forms a binding screw for the terminal of the resistance-conductor —C. Projections —g— may be formed on the edges of a plate for the end saddles to abut against, but, this is unnecessary as the wire when wound around the plate and saddles will hold the latter firmly in place.

In Fig. 9 I have shown in dotted lines teeth

—e— upon the sides of the saddle, but I prefer to use only one row of teeth which are placed on the bend as shown in full lines in the same figure. The edge of the plate can be made either round or chamfered to fit the groove in the porcelain or said edge may be made flat with square corners.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric heater, a plate, saddles of insulating material on two edges of the plate, and a resistance-conductor wound around the plate alternately across opposite planes thereof but not in contact therewith, and a perforated case, as and for the purpose described.

2. In an electric heater, a support, a rectangular plate having its opposite extremities held by said support, saddles of insulating material on two edges of the plate, and a resistance-conductor wound around the plate alternately across opposite planes thereof, but not in contact therewith, and a perforated case, as and for the purpose described.

3. In an electric heater, a perforated case, a metal plate held at or near its corners by the case, saddles of insulating material on two edges of the plate, and a resistance-conductor wound around the plate alternately across opposite planes thereof but not in contact therewith, as and for the purpose described.

4. In an electric heater, a perforated case, a plate held in said case, round or chamfered edges on said plate, saddles of insulating material on two edges of the plate, and a resistance-conductor wound around the plate alternately across opposite planes thereof, but not in contact therewith, as and for the purpose described.

5. In an electric heater, a perforated case, a plate in said case, two electric terminals or binding screws secured to the plate, saddles of insulating material on two edges of the plate and a resistance-conductor wound around the plate and saddles but not in contact therewith, as and for the purpose described.

6. In an electric heater, a perforated case, a metal plate held in said case, two electric terminals or binding screws secured to but insulated from the plate, saddles of insulating material on two edges of the plate, and a resistance conductor wound around the plate and saddles, but not in contact with the plate, as and for the purpose described.

7. In an electric heater, a perforated case, a body held in the case, saddles of insulating material in sections on each of two opposite edges of said body, and a resistance-conductor wound around the body and saddles but not in contact with the body, as and for the purpose described.

8. In an electric heater, a perforated case, a metallic body held in the case, saddles of porcelain in sections on each of two opposite sides of said body, and a resistance-conductor

wound around the body and saddles, but not in contact with the body, as and for the purpose described.

9. In an electric heater, a support consisting of a case or screen, inclosing the resistance-conductor, made in two parts, holding devices at each end of the case, a body around which the resistance conductor is wound between said holding devices, apertures between the parts of the case and electric terminals connected to the ends of the resistance-conductor and extending through the case between the two parts thereof as and for the purpose described.

10. In an electric heater, a support consisting of a case or screen, inclosing the resistance-conductor, made in two parts, perforations in the bottom and top of the case, holding devices at each end of the case, a body around which the resistance conductor is wound between said holding devices, and electric terminals connected to the ends of the resistance-conductor and extending through the case between the two parts thereof as and for the purpose described.

11. In an electric heater, a support consisting of a case or screen, inclosing the resistance-conductor, made in two parts, slots in the bottom, top and sides of the case, holding devices at each end of the case, a body around which the resistance conductor is wound between said holding devices, and electric terminals connected to the ends of the resistance-conductor and extending through the case between the two parts thereof as and for the purpose described.

12. In an electric heater, a metal plate, a perforation near the end of the plate, a binding screw, a yoke secured thereto and extending on both sides of the plate, a screw connecting the ends of the yoke through the perforation and an insulating bushing to insulate the yoke and screw from the metal plate.

13. In an electric heater, a slotted case made in two parts, a body or bodies of insulating material supported in and by the ends of the case, a resistance-conductor around the body or bodies of insulating material, conductors leading to the interior of the case between the two parts, and screws or bolts extending through the parts of the case to hold them together and thereby to hold the said body or bodies in position within the case.

14. In an electric heater, a slotted case made in two parts, a body or bodies of insulating material supported in and by the ends of the case, a resistance-conductor around the body or bodies of insulating material, conductors leading to the interior of the case between the two parts, insulating rings between the said parts, and screws or bolts extending through the parts of the case to hold them together and to hold the said body or bodies in position within the case and also the insulating rings.

15. In an electric heater, a support consisting of a case or inclosure divided longitudinally in two parts, supports or holding devices on the interior of the case, a plate or thin body held by said devices parallel to and in the plane of the meeting edges of the parts of the case, a resistance conductor wound around the plate, supply conductors leading through the case to the terminals of said resistance conductor, and means to hold the parts of the case together and the plate or thin body in position.

In testimony whereof I have hereunto signed my name this 21st day of March, 1892.

MARK W. DEWEY. [L. S.]

Witnesses:

H. M. SEAMANS,
C. L. BENDIXON.