E. G. VAN WIE & R. W. DAVENPORT.

ELECTRICAL HEATING UNIT.

APPLICATION FILED NOV. 25, 1912.

1,142,861.

Patented June 15, 1915.

Fig. 1.

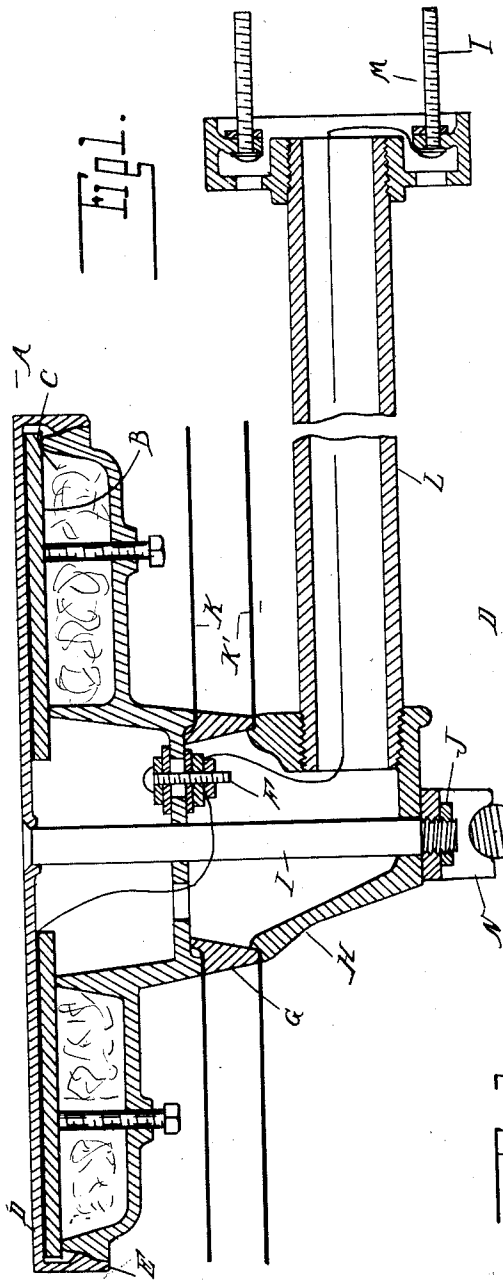


Fig. 3.

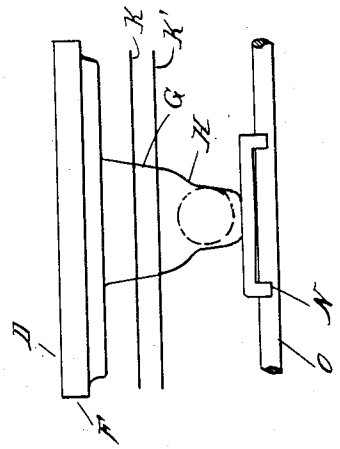
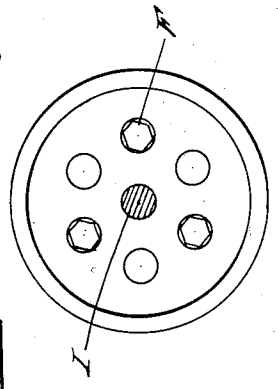


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWIN G. VAN WIE AND RANSOM W. DAVENPORT, OF DETROIT, MICHIGAN, ASSIGNORS TO DETROIT STOVE WORKS, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ELECTRICAL HEATING UNIT.

1,142,861. Specification of Letters Patent. **Patented June 15, 1915.**

Application filed November 25, 1912. Serial No. 733,511.

To all whom it may concern:

Be it known that we, EDWIN G. VAN WIE and RANSOM W. DAVENPORT, citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrical Heating Units, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electrical heating units and more particularly to constructions adapted for use in electrical cooking ranges.

The invention consist in the peculiar construction of the unit and the means employed for mechanically and electrically connecting the same and for reducing heat losses, as hereinafter set forth.

In the drawings: Figure 1 is a longitudinal section through the unit. Fig. 2 is a bottom plan view of a portion thereof. Fig. 3 is an elevation viewed at right angles to Fig. 1.

A is a disk electrical heater, preferably formed by a volute wound resistor arranged adjacent but insulated from a metallic plate B.

C is a hollow casing upon which the plate B is seated, and D is a top plate which has the peripheral flange E overlapping the casing C and having a spiral locking engagement therewith. The arrangement is such that the plate D is drawn down by its spiral into clamping engagement with the insulated resistor so as to produce a good heat-conducting contact therewith. The hollow casing C has an annular recess therein, just opposite the heating resistor, and filled with some good heat insulating or non-conducting material of small thermal capacity—such as magnesia. There is also a recess at the center of said casing in which the terminals of the resistor are arranged, these being preferably connected to binding posts F secured to the bottom of the casing. Beneath the casing C, the lower face of which is a surface of low radiating power, are the sections G and H, which are clamped together by a central bolt I headed at its upper end to engage an aperture in the plate D, and at its lower end threaded for engaging a clamping nut J.

K and K′ are disks of bright metal—such as aluminum—which are clamped between the sections C, G and H and serve to intercept the radiated heat from the casing. The section H has a laterally-extending tubular arm L, through which the terminal conductors from the resistor pass, and at the outer end of the arm L are mounted insulated contact pins M connected to the several conductors. These pins M are insertible in electrical contact sockets arranged on the frame of the range (not shown), so that by inserting these contacts in their sockets the unit is mechanically and electrically connected. The disk and the case C are further supported by a yoke N secured centrally to the bolt I, and having separated notched bearings for embracing the supporting cross-bar O secured to the frame.

With the construction as described, whenever the resistor is connected into a suitable electrical circuit heat will develop therein which will be conveyed by conduction into the disk plate B, from which it may be conducted into the article to be heated. Loss of heat in a downward direction is prevented by the non-conducting material in the casing C, which causes a considerable drop in temperature between the plate B and casing C, reducing the temperature of the latter to a point where a poor radiating surface may be maintained bright. Heat loss is further prevented by the reflecting surfaces K and K′ which reflect any downward radiation back upon the face of the casing C, thus tending to raise its temperature and reduce the amount of heat conducted into it, thereby, in turn, raising the temperature of the plate element and top.

To detach the unit it is merely necessary to lift the yoke N out of engagement with the cross-bar O, and then to pull the entire unit slightly toward the back of the stove, drawing the contact pins out of engagement with their corresponding sockets.

What we claim as our invention is:

1. An electrical heating unit comprising a circular hollow casing, heat insulating material therein, an electrical heating element adjacent to the flat top of said casing, a cover plate having a depending marginal flange, and coöperating locking members on said flange and casing having a rotative wedging engagement with each other.

2. An electrical heating unit including a casing arranged below the heating element,

the casing including an annular chamber and a central tubular shank the sides of which project above the base of the chamber to a point adjacent the heating element, heat insulation in said annular chamber and electrical connections passing through the central tubular shank.

3. An electrical heating unit comprising an electrical heating element, a casing beneath said disk, having a central tubular shank extending downward and laterally therefrom, connecting conductors for said element passing through said tubular shank, and insulated terminal contacts at the end of said tubular shank connected to said conductors and adapted for detachable engagement with the external circuits.

4. An electrical heating unit comprising a heating element, a hollow casing beneath said element having an annular chamber and a central tubular shank extending downward and laterally, non-conducting heat insulation in said annular chamber, a heat-reflecting plate beneath said heat insulation and secured to said shank, connecting conductors extending from said unit through said tubular shank and insulated terminal contacts at the end of said shank connected with said conductors.

5. An electrical heating unit comprising a disk electrical heating element, a hollow casing beneath said disk, tubular sections beneath said hollow casing and communicating therewith, the lower section having a laterally-extending tubular arm, a cap having a marginal flange engaging said hollow casing with interlocking engagement, a central tie-bolt engaging said cap and passing through said registering sections, and a clamping nut at the lower end of said bolt for securing said sections together and holding down the center of said cap.

6. An electrical heating unit comprising a hollow casing, a disk electrical heating element thereabove, a cap provided with a marginal flange having a locking engagement with said casing, an annular clamping plate beneath said heating element, and clamping screws engaging and passing through said hollow casing and bearing against said annular plate to clamp the same to said element.

7. An electrical heating unit comprising an annular disk electrical heating element, a hollow casing therebeneath having an annular chamber beneath said element and a central depending tubular shank, a cap above said element having a depending marginal flange having an interlocking engagement with said casing, tubular extension sections of said central shank, the lower section extending laterally, a reflector disk clamping between adjacent tubular sections and extending beneath the annular portion of said casing, non-conducting heat insulation in said annular portion of the casing, a central tie-bolt engaging said cap and passing downward through said tubular sections, and a clamping nut at the lower end of said tie-bolt.

8. An electrical heating unit comprising an annular disk electrical heating element, a hollow casing therebeneath having an annular chamber beneath said element, non-conducting heat insulation in said annular chamber, a cap provided with a marginal depending flange embracing said casing and having an interlocking engagement therewith, a sectional tubular shank extending downward from the central portion of said casing, the lower section extending laterally therefrom, a central tie-bolt engaging said cap and passing through said tubular sections to clamp the same together, insulated binding posts secured within said central tube, conductors passing outward through said tubular shank connected to the terminals of the resistor for said heating element by said binding posts, and terminal contacts at the outer end of said tubular shank connected with said conductors.

9. In an electrical heating unit comprising an electrical heating element, a casing beneath said element having an annular chamber and a central tubular shank, the said shank adapted to be separated from the annular chamber, and heat reflecting disks mounted on said shank.

10. An electrical unit comprising an electrical heating element, a casing beneath said element and a central tubular shank, the said tubular shank made of a series of sections, and heat reflecting disks positioned between the edges of the sections.

11. In an electrical heating unit comprising an electrical heating element, a casing beneath said element having a chamber and a tubular shank, and a heat reflecting disk mounted on said shank beneath the heating element.

12. In an electrical heating unit comprising an electrical heating element, a casing beneath said element, said casing including a tubular shank, a support, a connecting member passing through the support and upwardly through said shank, and a heat reflecting member clamped between the shank and the supporting member and disposed beneath the casing.

13. In an electrical heating unit comprising an electrical heating element, a casing beneath said element, a plate above the element, said casing being formed with a tubular shank, a supporting structure including a tubular portion which alines with a tubular shank of the casing, a securing member passing through the plate and extending through the shank of the casing, one terminal of said securing member being fastened to the supporting member, an inter-

mediate annular member interposed between the supporting member and the shank of the casing, a reflecting member interposed between said annular member and said shank, and a second reflecting member interposed between the annular member and the supporting structure.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWIN G. VAN WIE.
RANSOM W. DAVENPORT.

Witnesses:
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JAMES P. BARRY.