May 15, 1928.

1,669,588

E. G. BURNS ET AL

ELECTRIC HEATER

Filed Nov. 3, 1925

Fig. 1

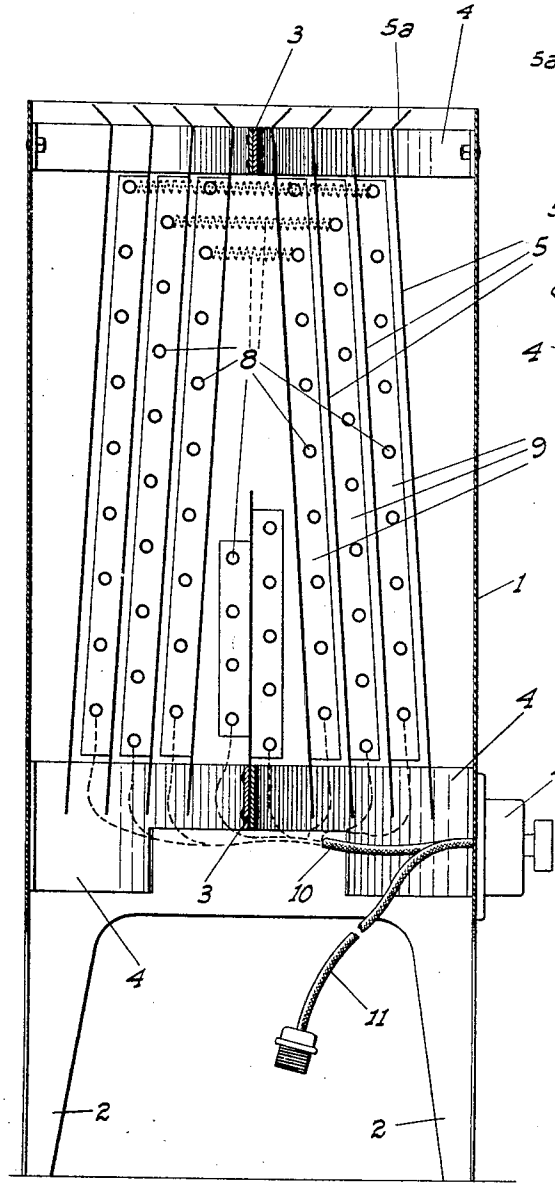


Fig. 2

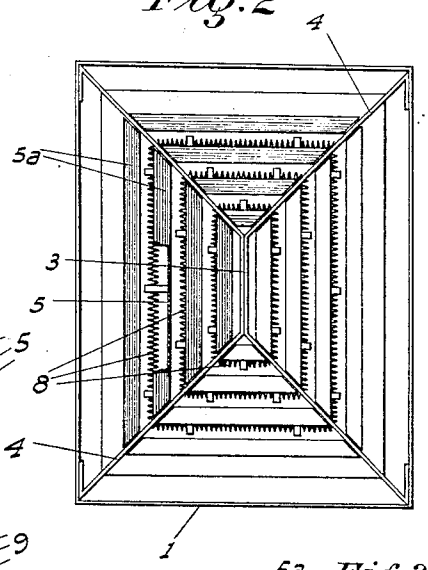


Fig. 3

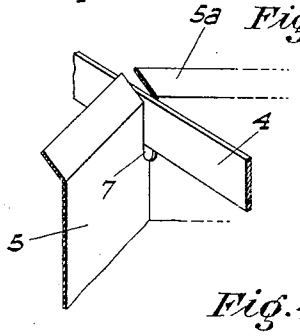
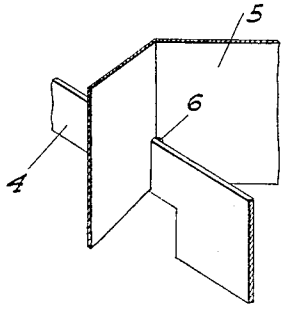


Fig. 4



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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

Application filed November 3, 1925. Serial No. 66,435.

This invention relates to improvements in the heating art and particularly to electric heaters.

In the common type of electric heaters now in general use it is the practice to attempt to absorb the heat from the electrical element merely by passing the air over the element or heating the element in the presence of still air, either of which methods haven't any great degree of efficiency for the reason that the only heat which is taken from the element under those conditions is that absorbed from the skin surface of the element as the air passes over the same or comes in contact therewith.

It is the object of our invention therefore to provide a means whereby the radiated heat from the elements will be first absorbed by surfaces susceptible of readily absorbing such radiated heat and then passing the air over those surfaces so that the air will absorb and carry off the heat from such surfaces. In this way there is a constant radiation of heat from the elements, absorption by the surfaces and absorption and carrying off of the heat from the surfaces by the air so that the greatest efficiency from the heating element can then be had, since the radiated and absorbed heat from the element is being constantly replaced by the electrical current passing through the element.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a vertical section of our improved heater.

Fig. 2 is a top plan partly broken out and in section to show the position of the element therein.

Fig. 3 is a fragmentary view showing the method of locating the upper ends of the absorptive plates of the burner.

Fig. 4 is a similar fragmentary view showing the method of supporting said plates at the lower ends.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 designates a casing of any desired construction which can be either mounted on legs 2 to provide a portable heater or which may be built into the floor, or a wall, or otherwise located wherever a built-in heater is found desirable.

At the upper and lower ends of the casing 1 we provide two substantially identical supporting brackets, each comprising a center web 3 and radiating arms 4 extending from the ends of the web 3 to the corners of the casing 1. Within the casing 1 are provided a plurality of spaced absorptive plates 5, each comprising a substantially rectangular metal plate element tapering slightly from its lower to its upper end and having an upper and outwardly flared portion 5^a. These plates have bottom slots 6 which have a loose fit over the lower supporting arms 4, and similar slots 7 having a sliding fit over the upper arms 4, so as to allow a full and equal expansion and contraction of the elements when heated without causing them to buckle.

Between the absorptive plates 5 are mounted the electrical elements 8 in any desired quantity and with any desired type of mounting found desirable, they being preferably shown in the drawings as being mounted through vertical supporting strips 9 secured edgewise to the plates 5, which members 9 are preferably made of insulating material of any desired type. The elements are suitably wired by wires 10 and 11 into and out of any desired form of switch whose casing is shown at 12, to control the flow of the current to the heater, the wire 11 being adapted to be connected with any suitable source of electrical energy and the switch 12 being preferably a three way switch for high, low or medium heat.

In practice the plates 5 are made of black iron or any other form of material which is readily absorptive of heat. The current flowing through the elements 8 radiates heat therefrom. This radiated heat is absorbed by the plates 5 and the air passing up through said plates by natural or forced draft in turn absorbs the heat from the surface of the plates. Thus a rapid and continuous absorption of the heat radiated from the elements is had into the plates and from the plates to the air so that the heater can function most efficiently. If the air was passing over the elements alone there would be very little heat absorbed since as already indicated the air would absorb only what

little heat possible by contact with the skin surfaces of the elements. This is a condition which we have found to be true in our practical experience and which is well known to the electrical engineering industry.

The black iron however or like material will absorb the radiated heat from the elements very rapidly and the air then skimming over the expansive surfaces of such plates 5 will have the action noted. Thus since the heat radiated from the elements is continuously replaced by the flowing current passing into the elements the greatest and most efficient take-off of that heat is had by the structure of our improved burner.

The upper flared ends 5^a of the plates 5 act to discharge the air in all directions around the top of the heater and at the same time present a further surface to absorb heat from the top element which would not be present if the spaces between the upper ends of the plates were freely opened in a vertical direction.

The slight tapering of the rectangular elements 5 from the lower to the upper ends presents an inclined plane surface to the air passing vertically therethrough so as to give a direct frictional contact between the same as the air passes upwardly.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

1. An electric heater including a casing, spaced supporting brackets within the casing, spaced plates of heat absorptive material within the casing and having top and bottom slots to fit the plates onto the brackets in sliding fit to allow of expansion and contraction of the plates without warping, and electric heating elements arranged between the spaced plates, the spaces between the plates being open at each end to allow the free passage of air therethrough.

2. An electric heater including a pair of symmetrically arranged and continuous vertical plate members each forming a unitary rectangular structure, the members being spaced apart to form a continuous vertical air passage of similar form, electric heating elements in said passage in spaced relation to the plates, the bottoms of the plates being vertically slit at the corners, and supports for the plates projecting into the slits and radiating from the center of the rectangular area defined by the plates.

In testimony whereof we affix our signatures.

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